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Putting Gender on the Map

Methods for Mapping Gendered Farm Management Systems in Sub-Saharan Africa

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ABSTRACT

Although the different roles of men and women in agriculture in different parts of Sub-Saharan Africa have been widely acknowledged, there have not been consistent efforts to collect data on these patterns. This paper presents a way of classifying gendered farm management systems and then describes pilots of four different approaches to collecting and georeferencing information on the dominant pattern in each area. Case studies from existing literature provided valuable insights but represent a time-consuming method, limited in spatial coverage and often leaving gaps because the original study authors did not report on all of the aspects of interest for a gendered farm management systems analysis. Expert consultations conducted in Ghana and Zambia allowed for dialogue among participants during map development, permitting them to explore nuances and dynamics. However, this technique may be restricted in scale to one country at a time, limiting cross-national comparison. An open online survey, or *crowdsourcing*, of the information tapped into a wide range of expertise, providing difficult-to-obtain widespread coverage, but had inconsistent data quality. Mapping of georeferenced information from nationally representative data could potentially provide widespread and relatively accurate data, but thus far the relevant underlying data have not been consistently included in large-scale surveys. Gender mapping offers an important step toward greater awareness of the diverse gender roles in agricultural farm management systems, but gaps remain between field reality and the understanding of gender relations in research, on the one hand, and between the researchers' understanding and what can be displayed on a map, on the other. Addressing these gaps requires developing a consensus on the key variables that characterize gendered farming systems, collecting these data systematically, and then linking the data to other spatial information for use in planning and prioritizing development interventions.

Keywords: gender, georeferencing, farm management systems, Africa, Ghana, Zambia

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1. INTRODUCTION

Gender differences matter in farming systems throughout Sub-Saharan Africa, with ownership and management of farms and natural resources by men and women being defined by culturally specific gender roles. The different roles men and women occupy in various farming systems—whether it be planting, weeding, harvesting, postharvest processing, marketing, or food preparation for household consumption—vary depending on context and culture. Likewise the rights of men and women to access, manage, and own key resources—including land, water, livestock, and other key agricultural inputs—will also vary accordingly. While men and women farmers may play differing roles, both make important contributions to agriculture throughout Sub-Saharan Africa. Estimates from the FAO (2011) based on internationally comparable data show that the female share of agricultural labor is almost 50 percent in Sub-Saharan Africa, albeit with wide variations within and among countries. Despite this high contribution, in many instances the roles women play in farming and production are not formally recognized, and there is a persistent misconception among policymakers and farmers themselves that "women are not farmers" in spite of the myriad roles women play in agricultural activities (World Bank and IFPRI 2010).

There is increasing recognition that it is important to better understand the complex interactions between gender and agriculture within African farming systems if efforts to increase production and productivity are to be successful. However, there remains a significant dearth of data on the gendered nature of farm management systems in Africa. While there is a growing number of excellent in-depth studies on gender in agriculture, this information is not available for larger geographic areas. As maps and analyses based on geographic information systems (GIS) become an important tool for agricultural development planning,[1] the lack of spatially referenced information on gender is particularly notable. As a result, planners developing agricultural or water management interventions, for example, do not know whether the interventions need to be targeted to joint household production systems or to men's and women's plots separately. Without information on gendered farm management systems, interventions are not able to target the appropriate decisionmakers and thus may lead to perverse outcomes by marginalizing or undermining women's production (see, for example, Schroeder 1993; van Koppen 2000, 2002).

To a certain extent, this lack of data may be indicative of past tendencies within the agricultural research community to overlook the gender dimensions of agriculture. On the other hand, this lack of data may speak to the logistical difficulties of accessing this type of context-specific agricultural production information in the first place, and then of building up a spatially referenced picture of gender roles in agriculture. In particular, the great variability of gender roles, even within a single community, has limited the ability to generalize to larger areas. Overcoming these constraints requires three steps: (1) developing a better understanding of gender relations in agricultural production, (2) finding ways of aggregating observations to portray the dominant patterns in each area, and (3) georeferencing the observations. This process is analogous to developing a soil map for Africa: There is clear variability in soils even within a field, let alone across a community or region. But soil maps are based on accepted soil typologies, ways of aggregating these soil types over larger areas, and georeferencing of the observations.

In this paper, we contribute to the complex picture of gendered farm management systems in Sub-Saharan Africa in a number of ways. In the next section, we review existing literature on the roles men and women play in agriculture in Sub-Saharan Africa to answer the question of why it is important to understand the gendered nature of farm management systems in Sub-Saharan Africa. In Section 3 we unpack the concepts associated with gendered farm management systems, followed, in Section 4, by carefully exploring the literature and case material on female-managed, male-managed, jointly managed, and separately managed farming systems. In Section 5 we turn to the methodological issues involved with

[1] The HarvestChoice initiative has provided an online GIS tool that allows users to access demographic, socioeconomic, and household attribute data reported at a subnational administrative level to better characterize the linkages between poverty and agriculture.

collecting data on gendered farm management systems. Drawing on a number of case study attempts to collect this type of data, we assess the pros and cons of four different strategies for data collection and gender mapping: (1) expert consultation workshop, (2) open online survey, (3) review of existing literature, and (4) aggregation of household survey data. In Section 6 we present and discuss preliminary results from two different attempts to collect data on gendered farm management systems using the methods discussed in the previous section. In Section 7 we discuss the implications of these preliminary results. We conclude in Section 8 with an overview of data needs for gender mapping and a number of recommendations for future data collection strategies based on the discussions throughout the paper.

2. GENDER AND AGRICULTURE IN SUB-SAHARAN AFRICA: THE RATIONALE FOR GENDER MAPPING

African women are important in agriculture, and agriculture is important to African women. Women play significant roles in planting, weeding, postharvest processing, food preparation, and so forth (Schultz 2001; Meinzen-Dick et al. 2010). Despite the many roles African women play in agricultural production, however, they remain disadvantaged in numerous respects. To understand why agricultural productivity is often lower for women than for men, we need a broader understanding of the obstacles women face. For example, Udry (1996) found that productivity per unit of land on female-managed plots in Burkina Faso was 30 percent lower than on male-managed plots within the same household because labor and fertilizer were more intensively applied on men's plots. Extensive evidence documents pervasive gender inequalities in access to key agricultural inputs, including these:

- *Land*: Studies from throughout Africa demonstrate that women are disadvantaged in both statutory and customary land tenure systems (Lastarria-Cornhiel 1997; Kevane 2004). Even when legislation aimed at strengthening women's property rights is enacted, women often lack the legal know-how or enforcement mechanisms to ensure these rights are maintained.
- *Human capital*: In addition to well-documented gender disparities in education in many countries, studies from throughout Africa have found that women routinely have less access to agricultural extension than their male counterparts (Gilbert, Sakala, and Benson 2002; World Bank and Republic of Malawi 2007; World Bank and IFPRI 2010). Women are also disadvantaged with respect to labor because they have less access to labor-saving technology and to the hired labor needed for lucrative labor-intensive cultivation.
- *Technological resources*: Women are disadvantaged with respect to access to important technological resources, such as fertilizer, improved seed, irrigation, pesticides, and mechanical power. In a recent review of differential gender access to nonland inputs throughout the developing world, Peterman, Behrman, and Quisumbing (2009) reviewed 24 empirical studies and found that when input indicators were provided, 79 percent found that men had higher mean access and 21 percent found that women had higher mean access to the given technology.

In addition, many nontangible assets, such as social capital and decisionmaking power, are more difficult for women to access (Peterman, Behrman, and Quisumbing 2009). These gaps in assets and inputs are a hindrance to agricultural productivity and poverty reduction. A wide-ranging body of empirical work suggests that increasing resources controlled by women could promote increased agricultural productivity (Saito, Mekonnen, and Spurling 1994; Udry et al. 1995; Quisumbing 1996). Udry et al. (1995) estimated that reducing inequalities in human capital, physical capital, and current inputs between men and women farmers in Sub-Saharan Africa could potentially increase agricultural productivity by 10 to 20 percent.

Gender differences matter not only for food production but also for food use. From the broader perspective of food systems, women are income earners and guardians of household food security. Women play a crucial role in the distribution of the food and nonfood household resources that determine the food security of the household. In a variety of contexts around the world, increasing the resources that women control has been shown to improve the nutritional, health, and educational outcomes of their children (Thomas 1990; Schultz 1990; Lundberg, Pollak, and Wales 1997; Hallman 2000; Quisumbing and Maluccio 2003; Skoufias 2005; Fafchamps, Kebede, and Quisumbing 2009).

Historically, the field of economics has been dominated by a unitary model of the household, in which the household was seen as a single unit that works together to pool common resources toward a common end. However, considerable evidence now exists to show that households do not act in a unitary manner when making decisions or allocating resources (Alderman et al. 1995; Haddad, Hoddinott, and Alderman 1997). This means that men and women within households do not always have the same

preferences, nor do they always pool their resources. This reality has important implications for productivity. It is clear that men and women play different roles within particular systems of agricultural production and occupy different socioeconomic positions as a result of these different roles (Carr 2008). Several empirical studies have found that redistributing inputs between men and women in the household has the potential for increasing productivity (Saito, Mekonnen, and Spurling 1994; Udry et al. 1995). Not only are there gender disparities in control over agricultural inputs, but a growing body of empirical evidence suggests that increasing women's control over resources has positive effects on a number of important development outcomes, including food security, child nutrition, and education (Hallman 2000; Quisumbing and Maluccio 2003; Skoufias 2005).

Many of the reported gender analyses of agricultural production compare productivity of *female-headed households* (generally defined as having no adult male) with that of *male-headed households*, in which there is at least one adult male but usually also at least one woman. While such analyses are relevant for gender issues, especially when de facto female-headed households are included, they still use the unitary model of the household and hence miss the gender relations in male-headed households. For example, Holden, Shiferaw, and Pender (2001) reported that female-headed households in Ethiopia used land much less productively than did their male-headed counterparts, but this tells us nothing about the productivity of women within male-headed households. Are they, as is often assumed, only helpers on the farms of husbands, fathers, sons, or other male relatives, or are they joint decisionmakers, or do they have separate plots from those of the men? All of these patterns are found, especially in Africa. The key question is where.

Given all that we know about how men and women play differential roles in agricultural production and use resources differently, there is a need for context-specific, gender-disaggregated data on agricultural production. Gender mapping allows researchers to identify patterns in the gendered organization of farm management systems in a particular area, thereby allowing researchers and practitioners alike to better understand how to target water management and other agricultural interventions to women and men farmers.

3. CONCEPTUALIZING GENDER MAPPING

The underlying conceptualization of the farm household in gender mapping is the bargaining (or collective) model of the household (Safilios-Rothschild 1988b, Quisumbing 1996). While the unitary model of the household tends to focus on the (typically male) household head, often bypassing the roles of women in the farm management system, in the bargaining model a farm household consists of various subunits, each of which is typically managed by one adult household member. This model acknowledges that a person different from the household head can make decisions about a production subunit and that holding a land title is not required to manage a plot. Furthermore, this model allows for recognition that within the farming *system*, people engage in many tasks at multiple farming subunit levels and that agricultural production activities are not static but constantly changing in response to economic and social opportunities for the individuals, whose incentives may diverge from those of the household or the head of household.

Gender mapping is also a move away from studies that associate particular crops with men or women, problematically treating the category of *women* as singular, and by implication suggesting that the experience of, for example, all women in a particular country or agroecological zone is the same (Carr 2008). Overgeneralizations of this nature are often too simplistic and potentially misleading when it comes to both context and scale of analysis. For example, Doss's (2002) examination of nationally representative household survey data from Ghana found that few crops could be defined as men's crops, and none was obviously a women's crop. This and other evidence suggests that in some settings, boundaries between male and female crops may be less rigid than they initially appear (Quisumbing et al. 2001). Though individual crops are not gendered, in some production systems there are nonetheless distinct gender patterns in crop choice (Wooten 2003). However, Dolan (2001) showed that these patterns can quickly change as economic and social opportunities arise. In addition, the literature survey below reiterates the broad differences and similarities across countries, regions, and households.

In order to take these variations into account and examine larger trends, we propose to map the gendered management of farming based on who has greater managerial control of the aggregate system of the investments, production subunits, labor allocation, and profits within a specific region (Safilios-Rothschild 1988b, van Koppen 2002). This methodology allows for comparisons between different sizes and types of farm management systems. Although there are natural variations between households and farm management systems, such gender mapping illuminates trends from the community level to the subnational level, revealing how broad social and cultural variables impact a specific population. In addition, it allows for comparisons between aggregated farm management systems irrespective of their scale. In other words, small, female-managed groundnut plots and large, male-managed wheat fields are both examined. Finally, gender mapping would generally take into account all types of production subunits that compose a farming system, including crops, livestock, and fisheries, which can highlight women's various contributions.

Gendered farm management systems can be defined by four types of management structures:

- *Male-managed farming system:* Agricultural production is completely or mostly controlled by the male head of household. Within this system, women either cultivate no land on their own, mainly providing labor for all agricultural activities, or cultivate only a small garden for household subsistence.
- *Female-managed farming system:* Agricultural production is completely or mostly controlled by women in either a female- or male-headed household. Women are the main decisionmakers about production and the use of outputs from the farming enterprise.[2] In almost all cases, these households are either *de jure* female headed, in which women are

[2] By using the term *farming enterprise* we refer to the fact that communities largely engage in multiple farming activities to produce commodities for home consumption, profit, or both. We are particularly interested in the different gender roles in farming enterprises.

widowed, divorced, or single, or are *de facto* female headed, in which women run the household and farm because their husbands are engaged in nonfarm labor or have migrated away from the household (Safilios-Rothschild 1988b).

- *Separately managed farming systems:* Both men and women control production subunits and are farm decisionmakers in their own domains. In this model, men maintain a specific plot or type of crop, livestock, or fishery while women are responsible for maintaining another subunit. Although they may provide labor or contribute inputs, such as fertilizer, to each other's subunits, men and women each have separate decisionmaking authority and control of outputs. While some researchers (such as Carr 2008) have tried to identify trends for the types of crops and livestock that men and women tend to control, Doss (2002) showed that most crops are maintained by both genders.
- *Jointly managed farming system:* Men and women share labor and decisionmaking over the farming enterprise and control the outputs. They have joint landholding and accounts.

These management types can be identified at household, community, or higher levels of aggregation. Even at the level of the individual household, there may be some difficulty in identifying the degree to which production in a household with at least one adult man and one adult woman is joint, separate, or male managed. At the community or higher levels of aggregation, it becomes necessary to identify the dominant pattern for display on a map. Because female-managed farming systems are almost always restricted to households with no man in agriculture (*de jure* or *de facto* female-headed households), it would be rare to find female-managed farming systems as the dominant pattern at the community or higher level. But when there is a mix of farm management systems in a community, district, or state, it becomes more challenging to identify the dominant form.

As an alternative to identifying areas in terms of a single dominant farm management system, it is possible to reflect a mix of systems by shading maps to indicate gradations between different systems. However, such shading is most easily done when there is a continuum, as between percentage of female- and male-managed enterprises. In this case it is difficult to identify whether the middle ground is composed of a mix of male- and female-managed enterprises or a mix of joint and separately managed farming systems.

It is thus imperative that researchers and practitioners identify the unit of analysis used on the map: Is the type of farm management system determined at the level of production subunit, household, or area? In order to create the map, it is important to aggregate to area level, identifying the general patterns in a community or region. Furthermore, while there may be a dominant pattern, other types of farm management systems usually are present in the same area. It is thus desirable (though difficult) to identify the level of error and state what proportion of the area is represented by the specific type.

It is also important to distinguish between normative patterns and those that apply in practice. For example, during the workshops (discussed below) to identify gendered farm management systems in Zambia and Ghana, respondents tended to select *jointly managed*, especially when the relationship dynamics were unclear or complex. However, further probing revealed that only one adult member of the household made decisions about a specific production subunit. On the other hand, where patriarchal norms are strong, respondents may identify male-managed farming systems even where women have significant independent production. When carrying out a survey or workshop, it is important to note the respondents' gender, nationality, and experience, which could potentially have a significant impact on shaping their perspectives on gender dynamics.

While it is critical to identify broad patterns in gender roles of women in agriculture, it is equally important to recognize that these patterns can change. Shifts in economic and sociopolitical conditions can significantly alter the dynamic between men and women in various ways. As markets develop, women can find new opportunities for income generation, but they can also be pushed out of the market by men (Dolan 2001). Migration by men for economic opportunities is also prevalent in Sub-Saharan Africa and can have mixed impacts on women's decisionmaking power and workloads in agriculture (David 1995).

4. GENDERED FARM MANAGEMENT SYSTEMS: CASE STUDIES FROM EXISTING LITERATURE

In this section, published literature and other documents are reviewed to provide case studies of the different types of farm management systems across the African continent and to examine the roles of men and women within them. A common theme across all farm management system types is the contribution of women, though with differing degrees of autonomy and control over decisionmaking. In almost all cases reviewed, women are active participants in completing duties, making decisions, or both in a production subunit. Despite the sociocultural constraints they encounter as a result of their gender, women actively participate in bargaining and negotiation with both their husbands and other participants in the value chain (for instance, traders and extension workers), protecting their assets as well as pushing for a large role in household food security. This review is not intended to be comprehensive but rather to highlight the various gender dynamics of management in Sub-Saharan African agriculture.

Male-Managed Farming Systems

Evidence shows that male-managed farming systems and enterprises dominate agriculture in Sub-Saharan Africa (Mupawaenda, Chawatama, and Muvavarirwa 2009). In this hierarchical system, men make decisions about the production process and income of crop and livestock production.

Women's roles within the male-managed farming system vary across communities and regions. The main difference is the extent to which women do or do not contribute labor to the agricultural enterprise. When women do not provide labor for men's fields, male family members and hired workers provide it. In a study of a rural community in Mali, Wooten (2003) found that men dominated market garden production, the premier source of income. Of the 22 garden units observed, 86 percent of plots (19) were managed by a male garden leader chosen based on his access to land. In terms of labor, senior men relied on outside help for their crops, mostly from younger brothers and sons. In contrast, the remaining 3 plots were headed by married women (only first wives) who had much smaller plots and barely any access to outside labor. Because of these obstacles, the women tended to engage in less-preferred nonagricultural commodity opportunities. At the household level, male and female members grouped by family lineage performed agricultural activities for consumption but still worked in separate groups and produced different crops.

In other cases, women contribute significant labor and time to men's farming enterprise but receive no compensation in terms of monetary pay or control of resources. Ogunlela and Mukhtar (2009) estimated that in Nigeria women make up 60 to 80 percent of the agricultural labor force but have little or no decisionmaking power. A study of rural poultry production in western Kenya found that men made all decisions about income and cultural gifts (Okitoi et al. 2007). However, women (with the help of children) were the predominant owners and caretakers of the chickens as well as those most responsible for sale and household consumption of eggs. Waters-Bayer's (1985) research of the agropastoral Fulani people of Nigeria and Niger revealed a similar dynamic. Among the surveyed households, women were primarily responsible for livestock management pertaining to the homestead, including milk processing and marketing, but had no control over other key parts of the production process, such as the selection of the grazing site, cattle diets, or veterinary care. In exchange for their contribution, women were entitled to milk from the herd, but they had little influence over the quantity given if they did not themselves own the livestock. Once the milk was allocated, a woman was free to decide how to use it in the household.

Women who do not participate in farm management often contribute to economic security through other activities. Another study of the Fulani people in Nigeria (Oladeji 2008) showed that the majority of male respondents (76.4 percent) performed livestock rearing as their primary activity, as compared with 15.8 percent of female respondents. In contrast, 61.4 percent of women primarily engaged in trading, in comparison with only 3.2 percent of men. This demonstrates how men and women

separately can control different production subunits, on and off the farm. As is usually the case, the majority of women were in charge of food preparation and livestock maintenance.

Separately Managed Farming Systems

As described above, separately managed farming systems exist when men and women have control over different subunits. Bassett (2002) argued that securing productive resources for cash cropping outside of the household is essential for gaining control over the farming subunit. His research in northern Côte d'Ivoire showed that most women controlled their own cotton plots but depended heavily on their husbands and male kin for obtaining land for their individual fields, spraying pesticides, and storing and marketing cotton. They also relied on hired labor and village-level social networks for critical tasks but had different abilities to access timely services depending on whether they could pay with cash or had to barter for their labor. Thus, women's yields and incomes were closely linked to the timing of plowing and fertilizer application as well as to the reliability of the men whom they depended on to sell their crops in the market. While women were allowed to control their own farming subunits, tensions often arose in the household, particularly in regard to how women allocated their labor time. During a period of economic downturn, male heads of households sought to mobilize the entire household to ensure a good harvest. The fear was that women's individual cotton growing would deplete available labor and undermine the patriarchal system. To exert their control, men threatened not to take women's cotton to the market or to pocket some of their profit. Despite these threats, women demonstrated their bargaining power by refusing to harvest their husbands' cotton until they were compensated (Bassett 2002).

Women have greater difficulties accessing the most lucrative markets, which are usually dominated or appropriated by men. In southwestern Mali, Wooten (2003) found that women were pushed out of commercial gardening. While gardening was traditionally a female domain, of the 34 garden plots studied, women made up only 14 percent of garden leaders. In comparison with plots held by men, those of the women tended to be smaller, located farther from the village, and more lacking in irrigation technology or protection (such as fruit trees or fencing). Furthermore, women had far less control over their own labor or that of others and had fewer land rights than men. Excluded from the commercial gardening sector, women were forced to undertake alternative income-generating activities with lower earning potential.

Detailed case studies also show that gender patterns change over time. In some cases, these shifts in economic and social conditions can lead to decreased productivity and conflicts between men and women, and can even change the type of farming management system in place. Dolan's (2001) research in the Meru District in Kenya showed that whereas men and women used to have separate enterprises, the growth of European export horticulture had led to men's appropriation of decisionmaking about the crops that were traditionally produced and marketed by women. Since women performed almost all the labor-intensive work, they were pressured to divert time away from subsistence farming and other duties to more lucrative export horticulture. In exchange, women were unequally compensated, performing 72 percent of labor for French beans but obtaining only 38 percent of the income. This was largely because payments were given to landowners (only men), so women had to depend on their husbands to give them a fair share. As in the case of Côte d'Ivore, women's rights over their plots were also challenged. More than 33 percent of women interviewed claimed their husbands had compelled them to grow French beans on their usufruct plots under threat of removing their rights to the plots entirely in order to maximize the men's incomes (Dolan 2001). In some cases, female respondents reported that arguments had escalated into domestic violence.

Female-Managed Farming Systems

Limited research has been done about female-managed farming systems despite the increasing role of women in agriculture. Safilios-Rothschild (1988b) found that women's control of household agricultural production was a result either of being widowed, divorced, or single, or of having husbands engaged in a nonfarm occupation or living away from the home. Especially the latter is often underreported. For example, in Kenya a number of studies have shown a very high percentage (40–90 percent) of women farm managers, but the official statistics still show a low percentage (27.3 percent) because the latter include only *de jure* female-headed households (World Bank 1989; Safilios-Rothschild 1994). Where *de facto* female-headed households were included in the definitions, as in the Zambia Population Census, high incidences (39–50 percent) of female-headed rural households were found in several districts (Safilios-Rothschild 1985). As female heads of household, they may face gender discrimination and absence of support in their role as head of household.

Women heads of households face many challenges in farm management. Access to land is imperative for agricultural production. However, in many countries women are unable to buy or own land themselves or face difficulties in controlling land inherited from their husband or family. Carr (2008) found that female-headed households in Ghana's Central Region experienced constraints because of the lack of a male head through whom they could access land. Some women could ask a male relative to acquire land for them, but plots obtained in this manner were typically much smaller than those owned by a man. The same study found that women also had the option of renting land; however, rent paid to the landowner amounted to one-third of the total production. Since many households have limited cash reserves, female heads are left with diminished incomes and savings. When women were able to access land, another study found, their plots were smaller than those of male-managed farms (Chipande 1987). In Ethiopia, where female-headed households do have land, they tend to rent out their land to tenants with very low productivity due to their own lack of male labor that would have allowed them to cultivate it themselves (Bezabih and Holden 2006; Holden and Bezabih 2007).

Women farm managers, both heads of households and married women controlling their own subunits, face greater challenges in adopting new technologies and inputs to improve yields and income, because these services are mostly targeted toward male farmers. In Oyo State, Nigeria, Yoruba and Fulani women reported that their exclusion from extension services and messages was the largest constraint to improvement of farming activities (Oyesola 2008). Basset (2002) found that male extension workers participated in gender discrimination, supporting men's efforts to restrict women's production and forcing women to grow cotton in secret and find a man to sell it in the market. On the other hand, services that do target women have an extremely high rate of adoption. In another Nigerian state, Okunade (2006) studied a state-run extension system for women in agriculture and found that the 80 women farmers surveyed had all adopted some combination of improved farming practices because of extension services offered in their community. While women received information through a variety of sources, the most influential factor cited for adopting the technology was the "credibility of the extension agents." This shows the importance of government-mandated policies and programs that focus on gender for creating greater opportunities for women producers.

Jointly Managed Farming Systems

Given the political and social structures in Sub-Saharan Africa, jointly managed farming systems are less prevalent there than in parts of Asia and Latin America, where land is more likely to be jointly held. A recent study in Uganda by Bomuhangi, Doss, and Meinzen-Dick (2011) showed some of the complications in identifying jointly managed farming systems: More than half of the plots were reported to be owned jointly by the principal couple, compared with 25 percent reportedly owned by the man alone and 18 percent by the woman alone. Although women and men reported almost equal levels of involvement in decisionmaking about what crops to plant, what inputs to use, and what to sell, women were less likely than men to report that they could sell, bequeath, or rent out plots, and women were slightly less likely than men to report that they controlled the income from plots (39 versus 44 percent,

respectively). Thus, deciding what is a joint production system is complex, even at the enterprise or household level.

In jointly managed farming systems, it is important to understand the roles of men and women in providing labor, inputs, and decisionmaking. If extension services, farmers' organizations, or irrigation systems include only men or the head of household, then women will be less able to participate in farm management, thereby undermining the joint nature of production systems.

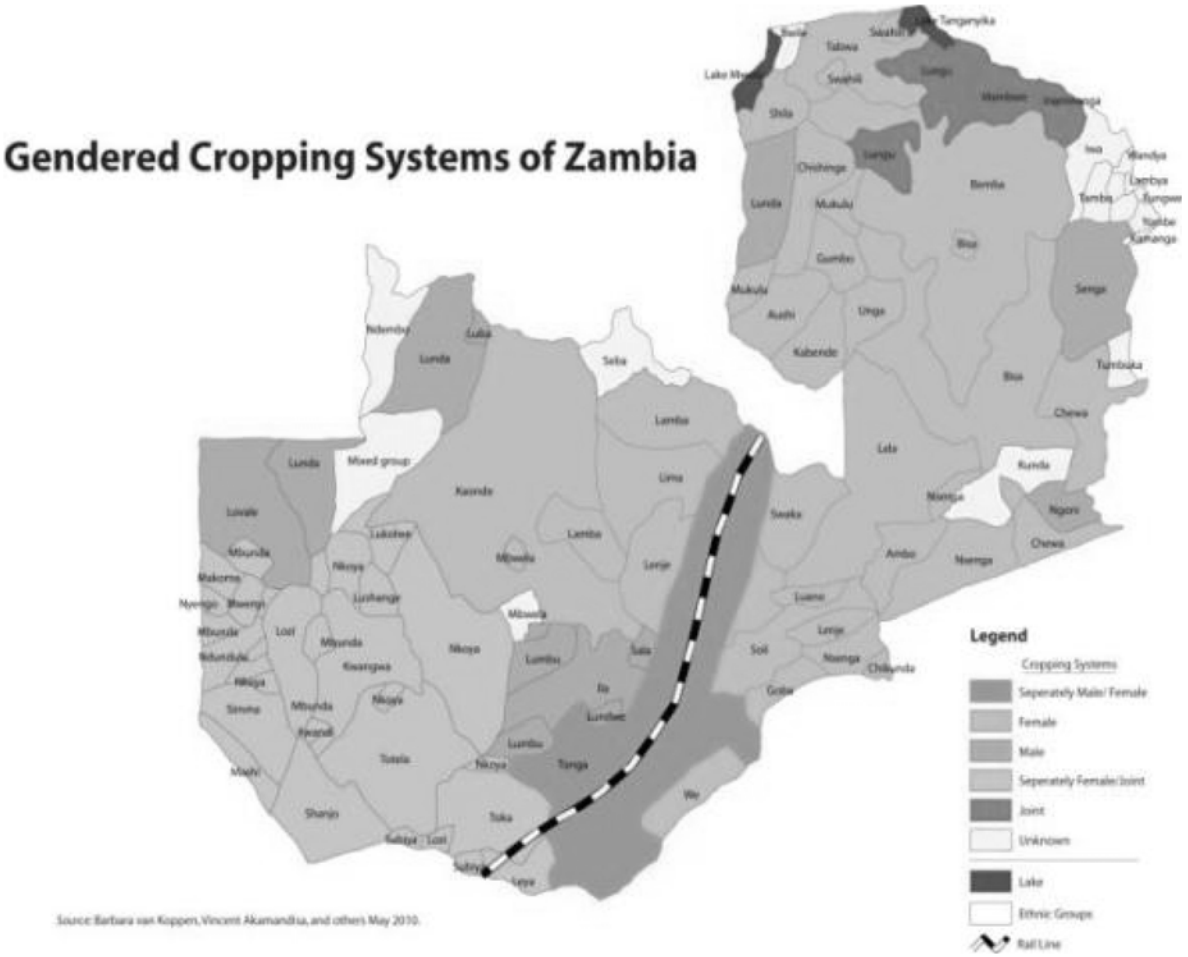
5. METHODOLOGIES FOR COLLECTING GENDER MAPPING DATA

Gender mapping has the distinct advantage of making it possible to consolidate gendered production data in one centralized map, thereby allowing researchers and practitioners to explore emerging patterns across contexts as well as to integrate gender information into other data and analyses where gender may not have been included in primary data collection. However, obtaining the data and aggregating them from households to communities to larger spatial units in order to develop maps is challenging. This section builds on the concepts and definitions developed in the preceding sections to provide an overview of four methods that have been used to develop a gendered map of agriculture in Sub-Saharan Africa: (1) expert consultation, (2) open online survey, (3) review of the literature, and (4) aggregation of household survey data. The advantages and disadvantages of each method will be discussed.

Expert Consultation Method

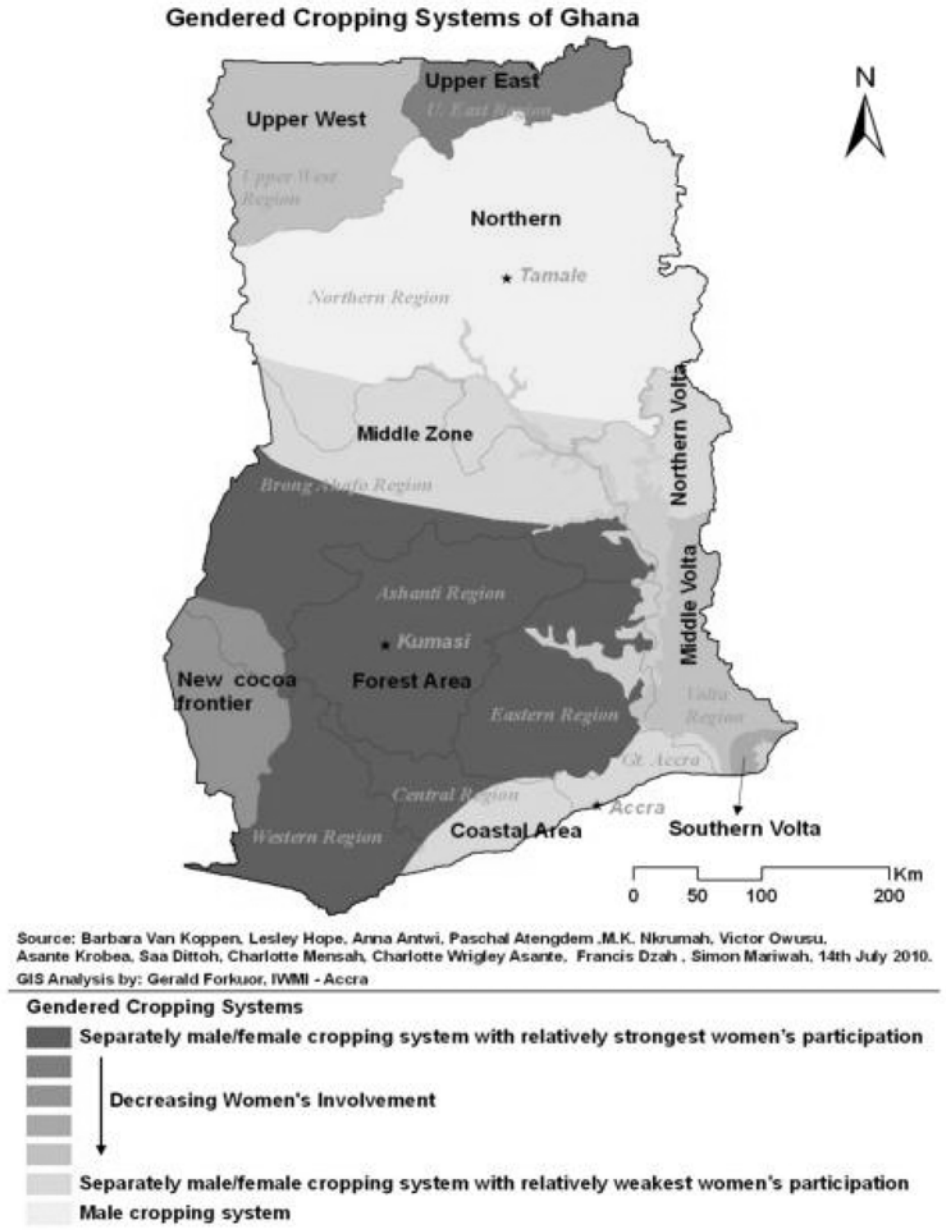
In this method, country or regional experts are selected to come together and—based on their experience and expertise—define the gendered production patterns of various regions, districts, or zones through facilitated discussion. An example of this method was a gender expert meeting facilitated by the International Water Management Institute (IWMI) in Zambia in May 2010. This meeting focused on only one component of the farming system: cropping. Because ethnicity was a priori supposed to be an important variable for differences in the gendered organization of cropping, ethnicity maps provided the basis for the gender maps. Participants formed three subgroups, drawing initial maps that were later compiled into one synthesis map, shown in Figure 5.1, by discussing differences and finding consensus. The workshop was followed by a qualitative gender study in four areas in Zambia (Akamandisa 2011). A second gender mapping workshop was held in Ghana in July 2010 with 12 experts. As in Zambia, a map of ethnic groups was prepared as a base map. Maps were drawn in subgroups and then synthesized. Conceptual inputs on gender mapping were provided by IWMI. Figure 5.2 illustrates the resulting gendered cropping system map of Ghana produced as the key output of the workshop.

Figure 5.1—Gender map of cropping systems in Zambia using data from expert consultation workshop



Source: Compiled by Barbara van Koppen, Vincent Akamandisa, Luxon Nhamo, and Sumith Fernando from data gathered at IWMI-facilitated gender expert meeting, Zambia, May 2010.

Figure 5.2—Gender map of cropping systems in Ghana using data from expert consultation workshop



Source: Compiled by Barbara van Koppen, Lesley Hope, Anna Antwi, Paschal Atengdem, M. K. Nkrumah, Victor Owusu, Asante Krobea, Saa Dittoh, Charlotte Mensah, Charlotte Wrigley Asante, Francis Dzah, and Simon Mariwah from data gathered at gender mapping workshop, Ghana, July 2010. GIS analysis by Gerald Forkour, IWMI, Accra, Ghana.

The two workshops used slightly different approaches, resulting in different map coding. The Zambia group started with the four basic categories of farm management systems identified above and added one additional category, "separate female/joint," as discussed below. The Ghana workshop participants focused on the relative roles of men and women in farming and ended up with a graduated scale of decreasing women's involvement, as also discussed below.

Advantages

- The expert consultation format allows for dialogue and brainstorming among participants during map development. Thoughtful interchange can be quite important for accurate gender mapping, particularly for discussing some of the more nuanced issues (for instance, consensus building on dominant farm management patterns in an area where multiple systems exist) as well as for exploring the dynamics that influence the gendered organization of farming or new ideas.
- All respondents are selected in advance, which makes it possible to verify their level of expertise and experience, and thereby to control for quality. It is also possible to choose respondents who represent a variety of backgrounds.
- The presence of a trained facilitator makes it possible to oversee the quality of responses and ensure that all respondents fully understand response categories and key concepts.
- Collating all responses in the same sit-down period makes it possible to ensure full participation and a more prompt, streamlined process.
- Expert-based participatory mapping is time efficient. In a one-day workshop with one write-up and check, years of (various forms of) experience are synthesized and visualized as a first hypothesis.

Disadvantages

- The scale at which gender mapping can be completed for multiple countries may be limited, given logistical difficulties in identifying experts and organizing workshops across countries.
- The data run the risk of selection bias, depending on participants. It is therefore important to ensure that the group will have comprehensive knowledge of the whole country and will reflect field reality rather than individual perceptions or notions of what should be.
- Substantial investment is needed to organize an in-person event. Some organizations may not have this type of capital available. A potential solution would be hosting a virtual meeting, but many of the experienced gender experts within a country lack sufficient Internet access at this time. Doing this work at the site of some other meeting where such experts are already gathered would be a way of reducing the costs of this type of workshop. Costs also inhibit the ability to provide continuity through follow-up meetings for deepening and updating the analysis.
- Participants may have a limited and mostly qualitative understanding of farming geography. Moreover, precise boundaries within predefined large areas like a country are often subjective, especially when boundaries of other influencing factors are difficult to define. This can lead to very inaccurate boundaries and mappings of imprecise geographic units such as “the north of the country” rather than well-defined geographic extents that may challenge existing perceptions.

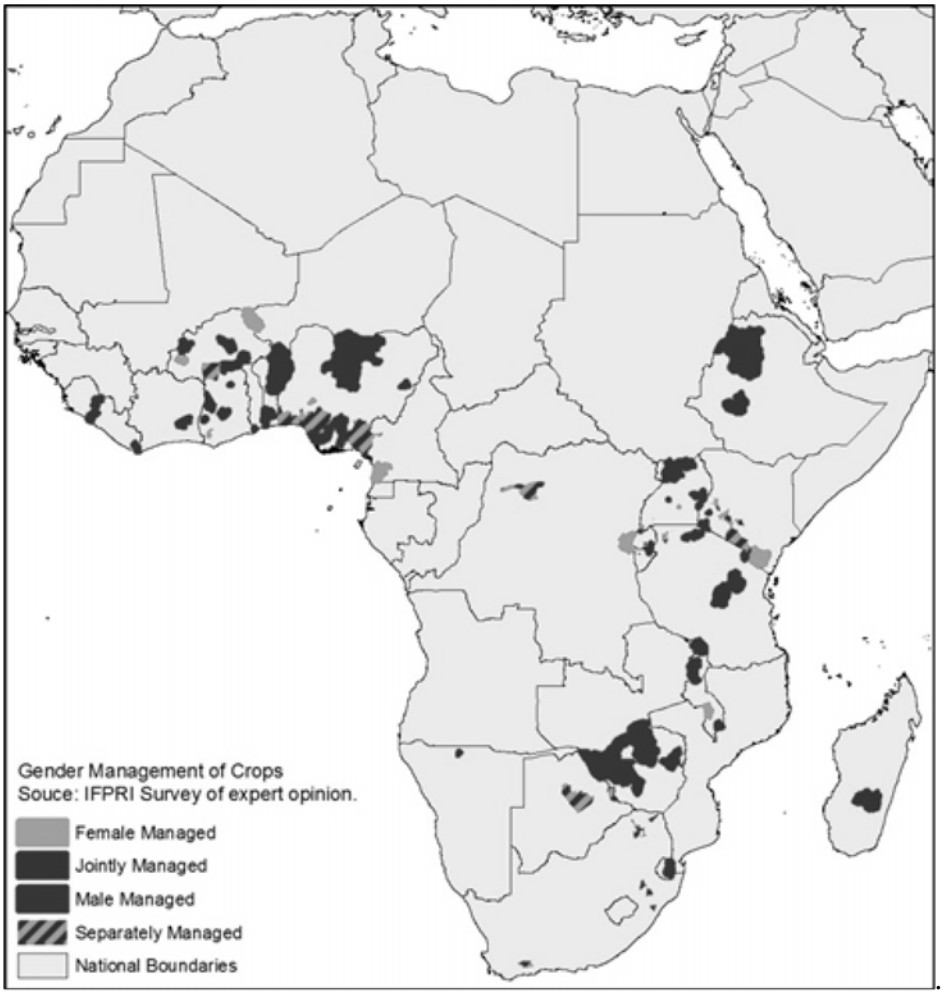
Open Online Survey Method

In this method a comprehensive survey including detailed information on gender patterns of farm management and agriculture is disseminated online to a variety of interested stakeholders. A pilot of this method was conducted by the International Food Policy Research Institute (IFPRI) during the period June–August 2011.[3] In this case, the detailed survey included modules on respondent background, farming systems and gender roles, country of expertise, gender and farming enterprises or management,

[3] An earlier version of the survey had been sent out in the summer of 2010. However, the response rate was low, leading to significant modifications and redistribution in the summer of 2011. Changes to the survey included simplifications of the cover note, instructions, definitions, and modules, and translation into French.

and gender roles in the area of expertise. The survey was made available online using the SurveyMonkey service. To reach as wide an audience as possible, an English and a French version of the survey were developed (see Appendix for the English version). The link to the survey was disseminated online using lists of researchers and other mailing lists that focused on gender, water, and agricultural issues in Sub-Saharan Africa. As an incentive to finish the survey, those who completed the survey in full were sent literature on gender and resource allocation. The survey data were used to create a gender map using GIS technology.[4] The information will ideally be stored in a centralized, geographically referenced database that can be shared widely. In total, 151 respondents completed the survey. Figure 5.3 shows the proof-of-concept gender map that was developed based on this survey.

Figure 5.3—Gender map of agriculture in Sub-Saharan Africa using data from open online survey



Source: Compiled by Ben Wielgosz from IFPRI survey of expert opinion, June–August 2011.

[4] In this survey, participants were able to input the location of the research area as a free response question rather than using Global Positioning System (GPS) coordinates. Although this strategy contributed to a higher response rate, we recommend that for a longer-term project a more robust tool than SurveyMonkey as well as a drop-down menu of administrative units be used to increase accuracy.

Advantages

- This crowdsourcing method makes it possible to reach a large pool of qualified respondents—not just those already identified as experts—and thus is a way to benefit from the experience of less conventional, but knowledgeable, sources (for example, extension agents, graduate students, and members of civil society organizations). In this sense, it is a more democratic procedure than expert workshops, allowing for cheaper collection of data over a larger geographic area.
- The method can be implemented within a fairly short period of time and with limited financial resources.
- Interactive online GIS tools can allow participants to interact with the spatial data directly, soliciting more precise responses while disseminating or revising the knowledge already recorded. Compared with other techniques, these tools also encourage more users to apply the gender-mapping data in their own analyses.

Disadvantages

- Quality control remains a challenge, particularly regarding respondent capability to answer questions. It becomes difficult to control for some respondents who may guess or answer incorrectly if they do not know the answer. In addition, the questions and definitions are also subject to the interpretation of the respondent, and it is difficult or impossible to verify a classification without documentation or discussion among experts in each area.
- Without incentives, it may be difficult to get respondents to complete the survey in full.
- Respondents—particularly those in Africa—may lack the necessary Internet connection to access the survey.
- The SurveyMonkey tool is very static and one-dimensional. Some questions may have to be simplified or adapted to the capabilities of the template.

Literature Review Method

A survey of the literature covering case studies of gender and farm management systems provides a third method of developing a gender map. The case studies described at the beginning of this paper provide examples of the available literature. Ideally, case material of this nature can be entered into a database and mapped using GIS technology to produce a georeferenced database.

Advantages

- Material used in the literature review is generally from verifiable sources and thus often of high caliber (for example, publications in peer-reviewed journals). This leverages the existing documented expertise without reproducing high-cost fieldwork.
- This method also allows for consolidation of existing data from multiple sources without the intensive organization or time that is required for an expert consultation or online survey.
- The literature has dates associated with publication and the information is frequently associated with collected data, allowing for gender maps to include a reliable temporal component.

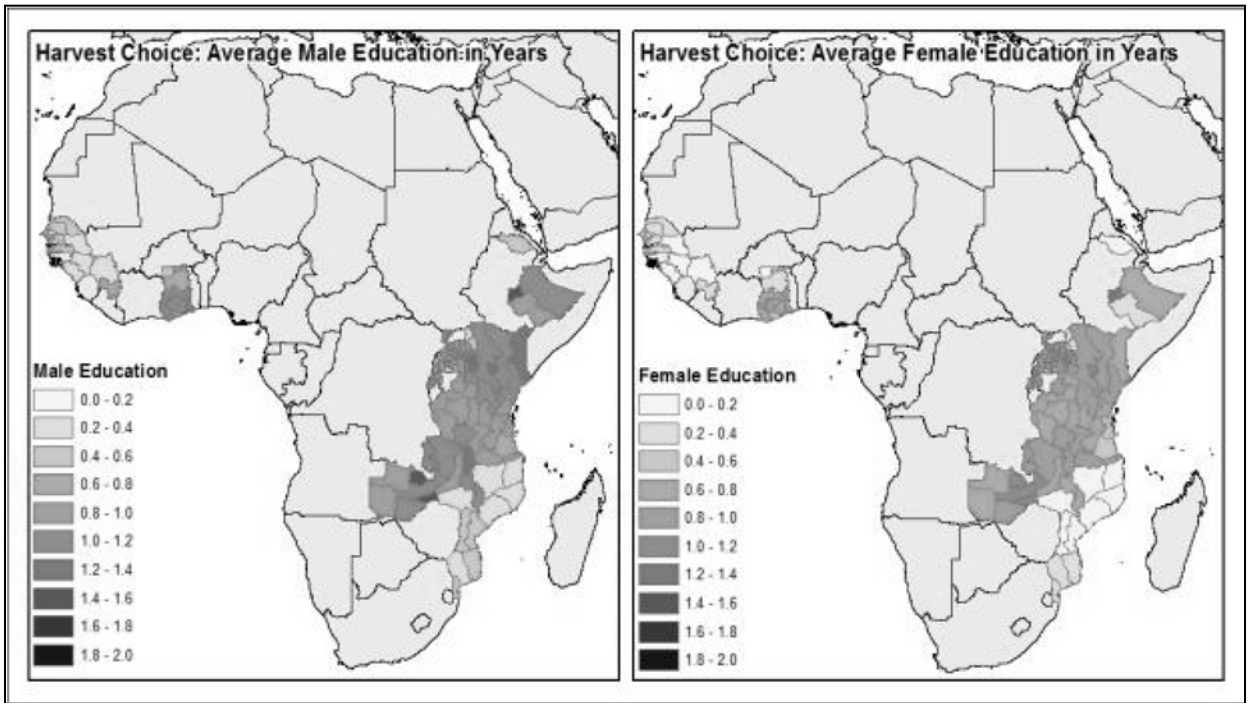
Disadvantages

- There are large gaps in data coverage, particularly since—as discussed above—there is currently a dearth of available data on gendered farm management systems in Sub-Saharan Africa. Thus, it may be quite difficult to produce a comprehensive gender map of a country, let alone of a region or area.
- In cases where information is unclear or incomplete, it is challenging to go to the original source for clarification or expansion.
- Essential definitions or farm management system typologies may vary across case studies, making comparisons difficult.
- Converting literature into data is labor intensive and requires a great deal of time and attention to detail. It cannot be outsourced, crowdsourced, or inadequately staffed without compromising quality.

Aggregating Household Survey Data Method

A large number of existing national-level household surveys have included various indicators of gender that can be aggregated across surveys and countries. These surveys are a large reservoir of reliable gender data with consistent coverage across much of Sub-Saharan Africa. Examples such as the World Bank's Living Standards Measurement Surveys (LSMS), the USAID MEASURE Demographic and Health Surveys (MEASURE DHS), and many national socioeconomic surveys have the benefit of statistically representative sampling covering entire countries, collection of the same indicators over a number of years dating back to the 1980s, and consistent methodology across multiple countries. By extracting the indicators of interest from these data sources and mapping the values to the administrative units used in the surveys, a reliable regional map can be generated. The HarvestChoice project is currently using this method to georeference a number of household indicators available to users online (Figure 5.4).

Figure 5.4—Gender comparison maps of education in Sub-Saharan Africa



Source: IFPRI and HarvestChoice, based on data from the HarvestChoice Household Characteristics Database series, http://harvestchoice.org. Accessed September 2011.

Advantages

- The method builds on the large reservoirs of statistically representative survey data collected by various institutions over the past 30 years. These sources are reliable, well documented, and already in widespread use by many development practitioners.
- Data quality is consistent across countries and years, with known sampling techniques and standardized errors.
- Geographic coverage is complete within countries and already representative at the district level, reducing complications in how to represent more ad hoc data across large geographic areas.

Disadvantages

- Indicators are limited to simple metrics, such as the ratio of male- to female-headed households, male and female education levels, asset ownership, household expenditures, and other commonly collected household data.
- Data are not explicitly oriented toward farming systems and include urban and nonagricultural households.
- Survey data are often linked to administrative units that have been changed, redrawn, or replaced by successive governments in Sub-Saharan Africa.

6. PRELIMINARY RESULTS

Expert Consultation Method

Zambia

The mapping method used in the Zambia case study allowed identification of zones with internal differences in their gendered organization, thus challenging any overgeneralization. Important contributing factors were identified as well, including land tenure, the generally understudied matrilineal systems in half the country, the male-biased influence of colonial and postcolonial public support for agricultural development, market opportunities taken by women, polygamy, female-headed households, and alternative livelihoods like fishing. Gender mapping seemed to be an efficient and fruitful method to identify the generally stronger involvement of women than usually recognized, the key contributing factors, and above all, gaps in knowledge and the need to further examine patterns in the gendered organization of cropping.

In the consultation, ethnicity was confirmed to be a major determinant of the gendered organization of farming in Zambia. However, the other key factor affecting gender in agriculture was the colonial and postcolonial economic development that took place around the rail line from Livingstone in the south, through the capital, Lusaka, and up to the Copper Belt. The land strip of some 50 kilometers on both sides of the rail line and major highway are generally declared as state land. Interventions by colonial rulers and later the state shaped smallholder agriculture, which generally became more market oriented near the rail line than elsewhere. Land allocation in state projects, for example for people displaced by the Kariba dam, has also favored men. On the other hand, in areas with fishing opportunities, women's dominant role in cropping has been reinforced by the fact that fishing is a male activity. Remarkably, the impact of copper and other mining, typically male jobs, on the gendered organization of farming was seen as minor.

In this exercise, all ethnic groups with matrilineal and uxorilocal marriage patterns, whereby husbands join their wives' clans and residences, were assumed to have a female-managed farming system. This is almost half of the country. The evidence to corroborate this assumption is fragmented and ambiguous, though. For example, the way in which ownership of fields is indicated shows female control. When a man performs his customary task of tree felling to shift the site of cultivation, the cleared field is named for him. But when cultivation and harvesting take place, the field is named for the wife. Also, there are anecdotes underlining that women decide how much of the income gained from the family's land is given to the husband for his personal needs. If men want their own field, they can, and do, address themselves independently to the land chief. For example, wetland plots (*dimbas*) can be cultivated by men primarily as their own fields. There is also the popular saying that married men in these areas need a torch, an umbrella, and a stick, because women can summon them to leave the house even in the night, when it rains, and when they are sick. On the other hand, the Christian religion and strengthened notions of men as household heads, and hence supposedly the preferred target groups of agricultural interventions, have changed these patterns. In short, the importance of land tenure for the gendered organization of farming and the precise nature of changes in matrilineal societies, and hence the gender classification of any given area, requires more in-depth research.

Mixed farm management systems are the second most widespread cropping system. While some ethnic groups were traditionally matrilineal, subsequent changes drew men more into cropping. State land or irrigation plots were allocated to men, and agricultural support targeted male heads of households. There are also patrilineal and virilocal ethnic groups, where polygamy prevails—with each of the wives managing her own field. Married women are also reported to have their own fields and to actively engage in commercial cropping for both traditional women's crops, like groundnuts and sweet potatoes, and new crops, like okra. With an average national rate of 20 percent female-headed households, the proportion of female-managed production subunits out of all production subunits is above the adopted threshold of one-third, so the cropping systems in these areas are classified as separately managed.

Some small ethnic groups at the borders of northern and eastern Zambia are patrilineal, with limited evidence of substantive female-managed plots, and were therefore defined as male-managed farming systems. For some other small ethnic groups, the gender experts judged cropping to be a genuinely egalitarian enterprise, classified as joint. The Lozis in West Zambia are a specific case of joint cropping, wherein wives and sisters retain substantive powers over land and crops, even as divorced heads of households.

Ghana

Participants in Ghana raised agroecological zones as a more important variable than ethnicity to explain differences in the gendered organization of cropping. In particular, the humid southern transition zone and drier area to the north were related to wealth and poverty, respectively, and to the resulting migration patterns. A further analysis of economic and migratory patterns, administrative regions, and other factors led to the distinction of eight broadly defined areas in which the gendered organization of cropping has specific characteristics. It appeared useful to make a relative ranking of the areas according to women's involvement in cropping processes and control over the output, as depicted in Figure 5.2 and briefly described below. Some quantitative data were also used. For example, proportions of female-headed households in the drier, northern areas ranged between 14 and 22 percent but were greater than 30 percent everywhere else (Ghana Statistical Service 2002). Taking, as in Zambia, one-third of the aggregate production subunits as a threshold for distinguishing a male-managed from a separately managed farming system, only the Northern Region was designated as having a male-managed farming system and all others were designated as separately managed.

Southern Ghana: Forest Areas of the Akan

The Akan people in the forest areas have Ghana's strongest involvement of women in crop decisionmaking. Land inheritance among the Akan is matrilineal, which gives women a somewhat stronger position in owning land and investing in its higher productivity. Both men and women have their maize, cassava, and plantain plots, although women's plots tend to be smaller. Maize and cassava are also intercropped with the cocoa, oil palm, and cashew trees when the trees are still small. Cultural norms oblige women to provide labor on their husbands' fields; men also hire labor. While men's larger plots leave more to sell, both husbands and wives contribute to family consumption and can sell as they want. Ownership of tree crops for cash, like cocoa, cashew, oil palm, and pocket-wise citrus/orange, is tilted toward men, but more than 25 to 30 percent of the cash tree plots are owned by women. Both women and men take advantage of the opportunities offered by nontraditional crops for sale, like tomatoes, okra, and exotic vegetables such as lettuce. This strong participation of women in farm decisionmaking is reinforced by women's participation in other economic activities, in particular trading. The money earned is reinvested in farming.

Northern Ghana: Upper East Zone

For completely different reasons, the harsh environment of the dry, less fertile, densely populated, and poorer Upper Eastern Region is ranked as having the second-strongest involvement of women, after the matrilineal Akan in the forest areas. Here, everybody is required to work for survival or migrate. The tolerant Muslim and Christian religions here allow for women's agricultural activities and polygamous women can grow their own plots. Moreover, nongovernmental organizations (NGOs) have significantly advanced women's cause over the past two decades. Although land inheritance is patrilineal, the combination of the harsh ecology, supportive religion, NGO activity, and male outmigration (with the proportion of female-headed households at 22 percent) has contributed to the area's strong involvement of women in cropping. Many women engage in cropping decisionmaking as *de facto* female heads of households. Unlike the male management of traditional crops, such as yam, millet, sorghum, upland rice, cowpeas, or beans, women's active involvement, alongside men's, is articulated for nontraditional crops,

including irrigated crops such as leafy vegetables, irrigated rice, soybeans, vegetables (onions, tomatoes), cotton, and maize. The collection of shea butter is another female-managed enterprise.

Southern Ghana: Western Region and Volta Region

The general widening of the transitional zone, which is attributed to climate change as well as agricultural and off-farm activities such as slash and burn and charcoal production, has rendered the original matrilineal Akan area no longer suitable for growing cocoa. This has led to migration and opening up of new cocoa-producing areas in the southern part of the Western Region. As men participate more actively in this migration, cropping and tree-growing systems become more male managed, although land tenure remains matrilineal. The patterns of farm decisionmaking in the long-existing food crop and coconut areas are comparable. However, men are increasingly taking up employment in the mines, which leads to some further feminization of agriculture. Rubber in this region has always been cultivated as a public enterprise, wherein both men and women find employment. In the eastern part of southern Ghana, southern Volta Region, women's involvement in cropping is as strong as in the new frontier zone. In the Keta and Ketu districts in the southern corner of southern Volta Region, informal nontraditional irrigation of shallots, onion, chilies, okra, tomatoes, and the like is well developed. Farmers' registration records in the Keta and Ketu districts revealed that 39 percent of all farms, which are usually irrigated, are female managed (Ministry of Food and Agriculture 2010). Shallow wells have been used for a long time and have been passed on from one generation to another. Tube wells with motorized pumps are becoming more widespread as well. In contrast, further north, in the central part of Volta Region, cassava, maize, and vegetables are grown, but there is very little cocoa. In the northern part, men manage yam cultivation, mainly for sale, while women cultivate sorghum and other food crops. This pattern rather resembles the patterns in northern Ghana.

Northern Ghana: Upper West Region

Most factors contributing to women's relatively strong involvement in agriculture in the Upper East Region are less articulated in the Upper West Region. Upper West is more endowed with natural resources than Upper East. Some districts in Upper West, for example the Tumu and Sissala, have food surpluses. The soils are richer and farms tend to be larger and further away from homes, favoring male-managed plots. There is less male outmigration. The percentage of female-headed households is only 18.3. There is less NGO activity. This helps explain women's lesser participation in cropping here than in the Upper East Region but more than in the Northern Region.

The Middle Belt of Ghana: Middle Zone

The middle belt of Ghana, which overlaps with the northern part of the Brong Ahafo Region, marks the ecological transitional zone from the southern forest to the northern savanna. Significant immigration southward from the drier north takes place, with the dry conditions moving further and further southward. Compared with the single rainy season and long dry season in the north, the middle belt's bimodal rainfall allows two cropping seasons annually. Plantain, maize, and yam have a long history of cultivation, partly for family consumption but mostly serving as a food basket for major cities like Kumasi and Accra. The indigenous ethnic groups in this region are related to the Akan and therefore matrilineal. The immigrants have settled in mostly disaggregated villages but also cohabitate in existing villages. By now they outnumber the indigenous people. New cultivation, deforestation, and charcoal production have already led to major soil degradation, especially in the northern part of the Brong Ahafo Region. This widens the transitional zone between the savanna and forest areas. The influx from the north is male dominated. Men are in the forefront of immigration, especially inasmuch as they are the ones to ask for land from the chiefs; women would not easily do so. Moreover, the immigrants bring their male-dominated organization of cropping systems with them. This leads to men's overall relatively strong participation in farm decisionmaking in this mixture of cultures. Yam cultivation is particularly male managed, although women can also cultivate yam fields and, for example, hire laborers for piling. Maize cultivation at a

larger scale is another area in which women are obliged to provide labor for their husbands' fields. Part of the output of this male-managed, market-oriented food cropping can be used for family consumption. Women also have their own plots with, for example, okra and other vegetables or maize. The produce is used for both family consumption and sale, for instance to buy fish and meat for family meals.

Southern Ghana: The Coastal Area

Cropping in the partly matrilineal and partly patrilineal coastal areas is generally even more male managed than in the middle belt. Male-dominated immigration from the Volta Region contributes to this trend. Crops grown include cassava, maize, and nontraditional crops such as pineapple, watermelon, and vegetables. Inland valleys are opened up for rice cultivation, mostly by men. Sugarcane for alcohol production is a male undertaking. In the coastal fishing communities, men do the fishing while wives and other women are actively engaged in fish processing and sale.

Northern Ghana: Northern Region

The traditional Northern Region, with patrilineal land inheritance, has the least involvement of women as farm decisionmakers in the country. The centuries-old strict Muslim tradition in this area, according to which women are supposed to observe seclusion (*purdah*) and refrain from agricultural labor, contributes to this male-managed farming system. The high rate of polygamy is slowly decreasing. However, unlike elsewhere, polygamous wives rarely have their own production subunits. Women grow, at best, groundnuts or leafy vegetables. Women's plots are often on the intensively used and degraded areas around the homesteads. While women are less active in cropping, they do engage actively in trading. Although there is some seasonal or permanent outmigration by younger men to the cocoa areas and urban areas, this does not seem to substantially affect the farming system of the Northern Region.

Although further triangulation with literature findings would have given a more accurate picture, the gender map of cropping systems in Ghana generated by the expert consultation process (Figure 5.2) is believed to be significantly more accurate than the still widely prevailing assumption that farm decisionmaking across Ghana is dominated by men. Also, a broad range of influencing factors was identified. One is whether a crop is traditional—that is, grown as a male-managed crop for at least 20 years (typically millet, sorghum, cassava, yam, cocoa, maize, cowpeas, and plantain)—or nontraditional in inland valleys and therefore open for both genders (irrigated local vegetables; crops such as tomatoes, onions, okra, and rice; and exotic vegetables and fruits such as lettuce, cabbage, pineapple, and watermelon). Other variables are male-dominated migration and clearance of new land; patrilineal or matrilineal land inheritance; distance of plots from homes; and women's nonfarm occupations, especially trade. Variables such as size of the production subunit and purpose of cultivation (whether for food or cash) appeared to be more nuanced and diverse than suggested by the widespread stereotype that men grow cash crops and women grow food crops. Participants realized that a focus on cropping missed the critical domain of women's power in Ghana, which is trade in agricultural produce by producers themselves. A gender map of trade, or of the entire value chain of cropping and trade, could have captured more of these effects. This process showed how straightforward it can be to first identify local diversity in the gendered organization of farming and draw the broad boundaries; then characterize each of the areas in further detail, highlighting the array of contributing factors; and finally rank the areas in order of male and female participation. This procedure avoids predetermined classifications of gendered organization. The ranking in the Ghana map allows differentiation among the seven zones that would all have been classified as separately managed had the procedure limited itself to the four types initially described. Thus, classifications emerged from the shared empirical expertise, as a form of grounded theory. Limiting the analysis to a country like Ghana, with participants who, together, know the whole country, allows this kind of comparison, which can then be further probed by looking at other factors that may be influential, in a way that would be much more difficult for an international study.

Open Online Survey Method

In total, 151 respondents completed the survey while it was available online from June to mid-August 2011. The majority of respondents (88 percent) used the English version; 12 percent used the French version.[5]

The respondents provided expertise from many different countries and professional capacities, showing the strength of online surveys to capture a wide and diverse audience. Overall, 31 countries were covered. Among the top nations cited were Nigeria (25 respondents), Ghana (17 respondents), Kenya (16 respondents), Tanzania (12 respondents), and Uganda (11 respondents). Participants came from a variety of professional backgrounds (see Table 6.1). While researchers are still the most highly represented group, the survey allows for sourcing information from other respondents, including extension agents, NGO staff, and inhabitants of an area. This diversity of backgrounds represents a broader pool of knowledge but also means that the expertise and understanding of respondents varies more than in the expert workshop method.

Table 6.1—Professional capacity of respondents

Type of professional capacity	Number of respondents	Percent
Researcher	41	27%
Inhabitant	35	23%
NGO staff	23	15%
Graduate student	16	11%
Gender specialist	10	7%
Government official	9	6%
Extension worker	7	5%
Civil-sector employee	5	3%
Other	5	3%
Total	**151**	**100%**

Source: Authors calculations based on results from Gender Mapping Online Survey.

The majority of the information shared by the respondents had not been written up in a formal report or database: Only 18.5 percent of respondents said that their information had been formally published. While this characteristic allows researchers to access a wider body of data, the lack of published or gray literature to back the responses makes it nearly impossible to verify the quality of the data.

Although there was a total of 151 respondents, only 44 percent of respondents completed the entire survey. Still, this is a much higher response rate than the first survey garnered in 2010. The difference is largely attributed to reducing the length of the survey and the complexity of the questions. For example, to identify the location of the area of expertise, we replaced questions about Global Positioning System (GPS) coordinates with questions that allowed respondents to simply fill in the name of the first and second administrative district. However, three days into the survey, we did notice that respondents tended to stop at the second page. To assure that we had the maximum data points for the GIS map, which only requires data about location and type of management system, we moved the management system question to an earlier part of the survey.

To better check for biases in the data, it would have been useful to ask about the respondent's gender and nationality. Both of these characteristics could potentially have significant effects on how respondents perceive both farm management systems and relationships between men and women.

[5] Unless otherwise noted, results from French and English surveys are aggregated.

Gendered Farm Management Systems

Respondents were asked to choose the dominant farm management system in their specified geographic area. Of the 114 responses (18 people answered the survey but did not select a management system category), male-managed systems were the most prevalent, followed by separately managed, jointly managed, and female-managed, respectively (see Table 6.2). The literature also supports the conclusion that male-managed systems are the most prevalent. What is somewhat surprising is the number of reported female-managed farming systems. We would normally expect to find this pattern at the community level only in areas of high male migration or nonagricultural employment. It is difficult to assess respondents' ability to accurately choose the most representative type. Given the complexity of these systems as well as the presence of social stereotypes that may affect choices, we recognize the challenges that respondents face, especially in a rigid survey format. It may be that respondents would have answered differently if they had filled out the questions about specific decisionmaking first or perhaps if the definition of area-level aggregation had been clearer. The latter was the approach used in the first draft of the survey, but that survey was too long, causing too many to drop out.

Table 6.2—Dominant gender patterns in specified area

Management system	Number of respondents	Percent
Male managed	46	40%
Separately managed	31	27%
Jointly managed	24	22%
Female managed	13	11%
Total	**114**	**100**

Source: Authors calculations based on results from Gender Mapping Online Survey.

Farming Enterprises: Focus on Crop Fields

After identifying the broad patterns of gendered farm management systems, respondents were asked for more information on the various farming enterprises commonly found in that geographic area (Table 6.3). Seven enterprises were listed to accommodate the multiple possible livelihood activities for home consumption, profit, or both.[6] In the ideal situation, there would be a similar pattern between farming enterprises sorted by management system type. However, both the small sample size (64 respondents in total) and the variation between countries and communities make it challenging to draw out patterns, beyond noting that crop fields are the most common type of enterprise across all management systems and that forests or woodlots are most likely to be found under male-managed systems. We predict, however, that livestock maps would have a different result.

Table 6.3—Prevalence of specific farming enterprises disaggregated by farm management system

Type of management system	Crop fields		Home gardens		Forest/ woodlots		Pastures		Large livestock		Small livestock	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Female managed	5	3	6	1	1	6	3	3	4	2	4	1
Male managed	25	2	18	7	11	13	8	15	17	5	20	1
Separately managed	16	0	7	7	2	12	4	10	8	6	11	1
Jointly managed	17	0	12	4	1	14	4	11	10	5	12	1

Source: Authors calculations based on results from Gender Mapping Online Survey.

[6] Although aquaculture was listed as a potential enterprise, no respondents indicated that aquaculture was a common activity, so it is not presented in the table.

Table 6.4 provides a closer look at women's and men's different roles in managing crop fields. Across the systems, men continue to dominate in making money-related decisions, managing the labor force (also closely related to income), and performing heavier labor like applying pesticides and plowing. On the other hand, both men and women contribute to planting, weeding, processing products, and selling them in the market. Women do not dominate in any parts of crop production except for processing crops for sale or consumption, which fits into traditionally feminine household responsibilities. This trend perhaps indicates that agricultural tasks are not as gendered as commonly indicated in the literature, but it also could indicate a bias against recognizing women's role in the farm management system. Furthermore, a surprising finding is the prominent role that men have within female-managed systems. While the sample is not large and the table looks at only one type of farming enterprise, the majority of tasks are completed by men or both men and women. Although the literature review did indicate that men assisted women with some tasks, such as buying land, these data do not show that women are managing any parts of the system. This leads us to believe that the respondents did not clearly understand the definition of this management type and that it is less prominent than the data indicated. In contrast, the results for the male-managed system support the background literature and indicate that women participate in many parts of cropping, particularly continuous, more labor-intensive, and less skilled activities like weeding, harvesting, and further processing the products. It also shows that men dominate money-related decisions, which is a defining factor for identification of the farm manager (and calls into question at least three of the cases of reported female-managed farming systems).

Table 6.4—Control of decisionmaking and production for crop fields, disaggregated by area-level farming management system

		Type of management system				
Who controls and performs task		**Female managed**	**Male managed**	**Separately managed**	**Jointly managed**	**Total**
1. Making money-related decisions (such as buying fertilizer)	Women		2			2
	Men	3	18	14	11	**46**
	Both	1	4	1	6	12
	N/A	1				1
2. Managing labor force (such as hiring)	Women	1				1
	Men	3	14	14	13	**44**
	Both		9	1	4	14
	N/A	1	2			3
3. Planting	Women		5	2	4	11
	Men	1	5	5	3	14
	Both	3	15	8	10	**36**
	N/A					0
4. Seed selection	Women	3	7	3	5	20
	Men	1	10	7	5	23
	Both		7	5	7	19
	N/A	1	1			2
5. Plowing	Women	1	2	2	3	8
	Men	2	13	10	9	**34**
	Both	1	7	2	5	15
	N/A	1	1	1		3
6. Pest control (such as spraying fertilizers)	Women		2		2	4
	Men	2	15	14	8	**39**
	Both	2	8	1	7	18
	N/A	1				1

Table 6.4—Continued

Who controls and performs task		Type of management system: Female managed	Male managed	Separately managed	Jointly managed	Total
7. Irrigating	Women			2	3	5
	Men	1	9	7	5	22
	Both	2	11	2	7	22
	N/A	1	4	3	1	9
8. Weeding	Women	2	8	6	6	22
	Men		2	4	1	7
	Both	3	15	6	10	**34**
	N/A					0
9. Harvesting	Women		9	3	3	15
	Men	1	14	5	1	20
	Both	3	2	7	12	**24**
	N/A					0
10. Processing crops for consumption or sale	Women	2	11	7	6	**26**
	Men		2	1	2	4
	Both	3	10	7	9	**29**
	N/A			1		1
11. Selling products	Women	1	4	4	1	10
	Men	1	5	8	4	18
	Both	3	14	5	11	**33**
	N/A					0
Total respondents		5	25	17	17	

Source: Authors calculations based on results from Gender Mapping Online Survey.

7. DISCUSSION

Under the current paradigm, information about gendered farm management systems in Sub-Saharan Africa is extremely limited, isolated to regional experts and practitioners, and buried within academic literature. In its present form, it is not only difficult to access the information, but the method of visualization hides the big-picture understanding of gender in agriculture, specifically patterns and gaps in research. This study was conducted to explore potential opportunities to gather and consolidate existing data into a single, georeferenced database that can be used by a wider audience.

In this paper, we explore four different methods for gathering data about gender and farm management systems: expert consultation, open online survey, review of the literature, and aggregation of household survey data. Each method offers particular opportunities but also has trade-offs. The online survey is appealing because it allows for gathering a large amount of information from respondents across the continent. Its online format is efficient and cost-effective. However, the drawback of an open survey is the challenge it poses for assessing the quality of the responses. In contrast, reviewing literature is a reliable source of information for the proposed database and allows the researcher to pull together findings from many sources that are rarely viewed together. However, because of the inability to make further inquiries, the literature review method provides sparse and sometimes fragmented data. While it can contribute important information to the database, this method alone is not sufficient. The expert consultation has the greatest potential for producing reliable data to generate a map. While more limited in the scope of countries and regions that can be covered in one period, this technique provides more accurate and reliable data because (1) the contributors have extensive academic and professional experience and (2) the process enables participants to collaborate and exchange ideas in person, which allows for deeper analysis of the contributing factors and trends as well as follow-up inquiries on complex topics. Also, by ranking geographic areas according to gendered participation, issues of definition can be addressed. However, this method comes at a higher financial cost than the online survey. Aggregating large-scale survey data is perhaps the most promising strategy to get accurate and reliable data, but to date the nationally representative surveys have not collected the data on gender issues in agriculture that would be necessary to map gendered farm management systems. It is worth exploring the possibility of identifying a relatively small set of questions about farm management systems that can be included in surveys such as the LSMS or the agricultural censuses. Some of the more recent African agricultural censuses have gone beyond the usual enumeration at the household or farm level to collect data on distinct enterprises within the farm (below the level of the whole household farm) that may be controlled by different household members, with sex disaggregation of the manager of each enterprise (FAO 2005). Georeferencing this information may provide the basis for building an officially sanctioned mapping of gender in farm management.

8. CONCLUSIONS

Gathering information on gendered farm management systems into a single database has the potential to inform and influence policy and program development to deploy water management technologies and to improve the farming livelihoods of both men and women farmers in Sub-Saharan Africa. Gender mapping offers an important step toward greater awareness of the diverse gender roles in agricultural farm management systems. Maps are powerful tools, not only for their visual impact but also for their ability to be combined with other spatial information for use in planning and prioritizing development interventions. A lack of systematic information on spatial gender patterns in agriculture therefore limits our ability to anticipate, for example, how climate change will impact women's and men's production systems and how interventions such as irrigation might be more effectively targeted.

However, large gaps still exist between field reality and the understanding of gender relations in research, on the one hand, and between the researchers' understanding and what can be displayed on a map, on the other. Each step necessarily requires simplification of the complexities and dynamism involved. While a strength of mapping is the ability to highlight broad trends in farming, particularly the often-ignored role of women, the trade-off is that the method conceals variation within the area of study and thus offers an unrealistic degree of precision.

In this study, the data gathering or mapping techniques alone still do not adequately and systematically capture the complexity of the roles of men and women in a specific area or community. Many questions remain: How does one accurately scale up from the production and household subunit to the area subunit? How does one visually present the complexity within an area without losing dominant patterns? How does one measure the error of a gender map? What technologies are optimal for both data collection and representation? What are the right questions that generate accurate answers about gender relations, and from what sources can the information be obtained? If dependent on interviews, how does one account for respondent biases due to gender, culture, or education? In addition, more research is needed about the individual and connected roles of men and women in different parts of agricultural production as well as development of more precise definitions for types of management systems.

Rather than presenting a definitive answer to these questions, this paper offers several alternative approaches that use different sources and levels of aggregation, resulting in the mapping of somewhat different information. Mapping of gender patterns should therefore not be seen as a final, unchanging end point but should be a start for more in-depth research. The maps generated in this study are hypotheses of the gender dynamics that should serve as a starting point for further testing and fine-tuning as well as mutual cross-checking and triangulation. Cross-checking between different methods not only can be used to validate the map from one approach but also can lead us to a deeper understanding of gender relations in agriculture.

There are multiple ways that the technology used in this paper can be improved to more accurately and dynamically represent gender relations. In this study, the maps produced are static, but over the long term the crowdsourced map (Figure 5.3) could be updated with new information. It would be beneficial to create a database that would be available online for practitioners, academics, and policymakers, who can use the information as well as contribute their own findings to develop and assess the feasibility of different strategies for water management and other agricultural interventions. This database would allow participants to access information applicable to their specific region rather than to the general continent. Another shortcoming of the map is that it shows only one variable, whereas gender relations in farming are determined by a complex set of factors. Ultimately, it would be more useful to create an interactive database that allows participants to click on a particular area and find a wealth of important information, including the prevalence of polygamy, migration trends, land laws, predominant management of subunits, and area-specific case studies. Once online, the database would also be collaborative and active, allowing experts to contribute new findings. However, there would be a need for proper regulation of how the information is distributed and what is added. This database could easily be expanded to other contexts and regions, such as South and East Asia.

The next stage should be greater systematization of data gathering as well as broader discussion of what, precisely, is to be mapped. As discussed earlier, integrating questions about farming management systems with those about household management in large-scale, nationally representative surveys is a key opportunity for scaling up this framework. While the underlying issues of mapping gender relations in agriculture are complex, creating such maps provides an important opportunity to build awareness among policymakers and development program staff about the variation in gender roles in water management and other agricultural processes.

APPENDIX: SURVEY QUESTIONNAIRE

Gender Mapping SSA Project (English)

Introduction

The International Food Policy Research Institute (IFPRI) and the International Water Management Institute (IWMI) are issuing a second call for participation in a "gender mapping of agriculture in Sub-Saharan Africa" short survey exercise. The findings from this survey will be used to better understand how to target water management and other agricultural interventions to women and men farmers.

Gender mapping aims to:
(1) collect information from gender and farming experts in the field,
(2) identify patterns in the gendered organization of farming systems in a particular area,
(3) classify them as male, female, dual or separately managed, and;
(4) incorporate this information into a centralized, geographically referenced database that can be shared widely.

If you are knowledgeable about farming systems in a country, state or district in Sub-Saharan Africa, whether as extension worker, researcher or practitioner we encourage you to fill out the survey. Please note, we have revised the survey since our first call for participation so if you were unable to complete the survey the first time around we encourage you to try again.

The survey will take about 25 minutes, and is divided in 5 parts. Even if you cannot answer all the questions in the survey, we encourage you to fill in as much of the survey as you possibly can.

As a token of our appreciation for filling out this survey, we are offering to send the book "Household Decisions, Gender and Development." If you are interested in this, please fill out your address on the last page of the survey.

Please share this survey link with your colleagues.

Gender Mapping SSA Project (English)

Section 1: Biographical Information

Instructions: Please fill out the survey for the African country you are most familiar with

***1.1 Name of country, for which you are filling out the survey**

***1.2 In what capacity, do you know this country?**

***1.3 Has the information you are providing in this survey been written up already in a formal report or dataset?**

- ◯ Yes
- ◯ No

1.3a If available, copy and paste the reference of the report or data set referenced in question 1.3, preferably with web link.

(Optional Information)

1.4 Your name

1.5 Your organization

1.6 Your email address

Gender Mapping SSA Project (English)

Section 2: Farming Systems and Gender Roles

Instructions: Gender relations vary within a country, region, and even from one household to another. What we are looking for are patterns that generally apply at the community or larger scale, up to the sub-national level. An area with a specific gender distribution in farming may be called different things in different countries, such as a province or region. We provide a drop-down list of types of units for your convenience. Ultimately, this will be "mapped" with a particular color for the area that you define as having a certain gendered farming system.

The following questions refer to the country you specified in section 1.

***2.1 Within the country specified in section 1, what is the name of the state, region or district which you are documenting here?**

2.1a If you can be more specific, what is the name of the lowest level administrative unit in this area (e.g. province, community, village) which you are documenting here?

Instructions: We are interested in identifying broad patterns of gendered farming systems first, followed by some more detailed questions in the next section about men's and women's involvement in various aspects of farming.

*PLEASE NOTE we are looking for classifications that are generally applicable at the village/community level, even if there is variation within the community.

***2.2. Overall, what gender pattern in agriculture is dominant in your specific area?**

◯ MALE-MANAGED: agricultural production system are completely or mostly controlled by the male head of household in which women either cultivate no land of their own or only cultivate a small garden for household consumption but mainly provide labor for all crops as unpaid farm laborers

◯ FEMALE-MANAGED: agricultural production system are completely or mostly controlled by the women in the household, who are the main decision-makers about production and the use of outputs from the farm. Female-managed enterprises include the farm enterprises of female-headed households.

◯ SEPARATELY-MANAGED: both men and women control production sub-units and are farm decision-makers in their own domains. For example, men may have certain types of fields, crops, or animals, and women have others (including homestead gardens). Although they may provide labor to each other's fields or animals, the men and women each have separate decision-making authority and control of outputs.

◯ MIXED OR JOINTLY MANAGED: men and women share labor and decision-making over the enterprise and the use of outputs with joint landholding and joint accounts.

***2.3. In addition to the dominant patterns, which other gender patterns in agriculture matter in your area?**

	None	1/4	1/2	3/4	All
Male-managed	◯	◯	◯	◯	◯
Female-managed	◯	◯	◯	◯	◯
Separately-managed	◯	◯	◯	◯	◯
Mixed or Jointly-managed	◯	◯	◯	◯	◯

Gender Mapping SSA Project (English)

Section 3: Information on Country or Area of Expertise

Instructions: Please answer the questions according to the country or area you specified in sections 1 and 2.

*3.1. What are the main livelihood activities in the specified region?

	Primary Activity	Secondary Activity	Not Applicable
1. Cropping (mostly cash crops)	◯	◯	◯
2. Cropping (food crops: home consumption and sale)	◯	◯	◯
3. Cropping (food crops: mostly home consumption)	◯	◯	◯
4. Livestock Dairy	◯	◯	◯
5. Fishing and Aquaculture	◯	◯	◯
6. Agricultural Wage Labour	◯	◯	◯
7. Non-farm activities	◯	◯	◯
8. Seasonal migration	◯	◯	◯
9. Other	◯	◯	◯

If other, please specify

3.2. List the common religion(s) in the specified area

3.3. List the common ethnic groups in the specified area

*3.4. How common is polygamy (multiple wives) in the specified area?

- ◯ Very common
- ◯ Somewhat common
- ◯ Not common
- ◯ Not Applicable

Gender Mapping SSA Project (English)

3.5. Approximately, how many households in the specified area are formally female-headed (e.g. by single women, widows, or divorcees—de jure)

- ◯ None
- ◯ 25 percent
- ◯ 50 percent
- ◯ 75 percent
- ◯ All

3.6. Approximately, how many households in the specified area are functionally headed by women because husband/father is away (de facto female headed)?

- ◯ None
- ◯ 25 percent
- ◯ 50 percent
- ◯ 75 percent
- ◯ All

Gender Mapping SSA Project (English)

Section 4: Farming Enterprises and Management

Instructions: In the following section, you will be asked a series of questions based on the farming enterprises that community members practice in your area. By "farming enterprise" we refer to the fact that communities largely engage in multiple farming activities to produce commodities for home consumption and/or profit. We are particularly interested in the different gender roles in farming enterprises (for example, if men manage the wheat crop and large livestock while women have home gardens and sell the milk produced by the cows in the market).

Carefully read the list of terms below. Looking at the general patterns in your area, fill in the information for the main farming enterprises that apply.

The types of farming enterprises or livelihood activities are:

4.1 CROP FIELDS- open or cleared land used for agricultural activities, specifically growing and harvesting crops (including annual and permanent crops like coffee and cocoa).
4.2 HOME GARDENS- a plot of ground, usually near the homestead, used to cultivate fruits, vegetables, and herbs. (Crops in gardens are usually mixed—a field of beans would generally be considered a "crop field".)
4.3 FOREST/ WOODLOTS- land mostly under trees, used to harvest wood for fuel, lumber, as well as other non-timber forest products.
4.4 PASTURES- an area covered with grass or other plants suitable for grazing livestock or gathering wild plants.
4.5 LARGE LIVESTOCK- large, domesticated animals raised in an agricultural setting to use for food, fiber, or labor. Large livestock includes cattle, camels, buffalo, horses, etc.
4.6 SMALL LIVESTOCK AND POULTRY- small, domesticated animals raised in an agricultural setting to use for food, fiber, or labor. Small livestock includes pigs, sheep, goats and poultry.
4.7 FISHERIES AND AQUACULTURE- catching and/or cultivation of marine or freshwater fish/aquatic species.

***CROP FIELDS: open or cleared land used for agricultural activities, specifically growing and harvesting crops (including annual and permanent crops like coffee and cocoa.**

4.1. According to the broad patterns in the area are crop fields a primary farm enterprise?

- ◯ Yes (If yes, please answer remaining questions in section 4.1)
- ◯ No (If no, click "next" at the bottom of the page)

4.1.1. What is the typical size (roughly in hectares) of the crop fields (total over multiple plots on a farm)?

- ◯ Less than 0.5
- ◯ 0.5-1.0
- ◯ 1-5
- ◯ 5-10
- ◯ Greater than 10

Gender Mapping SSA Project (English)

4.1.2. Who do the crop fields belong to?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Available

4.1.3. Under what kind of land tenure system are these plots held?

- ◯ Statutory (legal title)
- ◯ Customary Tenure
- ◯ Public Property
- ◯ Lease (share-cropping)
- ◯ Not Applicable

4.1.4. Do women and men have separate crop fields?

- ◯ Yes, women and men have separate crop fields.
- ◯ No, women and men share the same crop fields.
- ◯ Not Applicable

4.1.5. What crops are grown in these fields? For each crop, answer the following:

	Crop	Gender Management of Production	For Consumption, Sale, or Both	Who Receives Income from Sale	Who Controls Household Consumption of This
1					
2					
3					
4					
5					

Gender Mapping SSA Project (English)

4.1.6. Indicate who makes decisions or performs the following tasks for these plots:

	Women	Men	Both Women and Men	Not Applicable
Making Money-Related Decisions (e.g. Buying Fertlizer)	◯	◯	◯	◯
Managing Labor Force (e.g. Hiring)	◯	◯	◯	◯
Planting	◯	◯	◯	◯
Seed Selection	◯	◯	◯	◯
Plowing	◯	◯	◯	◯
Pest control (e.g. Spraying fertilizers)	◯	◯	◯	◯
Irrigating	◯	◯	◯	◯
Weeding	◯	◯	◯	◯
Harvesting	◯	◯	◯	◯
Processing Crops for Consumption or Sale	◯	◯	◯	◯
Selling Products	◯	◯	◯	◯
Other	◯	◯	◯	◯

If other, please specify

Gender Mapping SSA Project (English)

Section 4: Farming Enterprises and Management

***HOME GARDENS- a plot of ground, usually near the homestead, used to cultivate fruits, vegetables, and herbs. (Crops in gardens are usually mixed—a field of beans would generally be considered a "crop field".)**

4.2. According to the broad patterns in the area, are home gardens a primary farm enterprise?

- ◯ Yes (If yes, please answer remaining questions in section 4.2)
- ◯ No (If no, click "next" at the bottom of the page)

4.2.1 Who do the plots belong to?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Applicable

4.2.2 Under what kind of land tenure system are the home gardens held?

- ◯ Statutory (legal title)
- ◯ Customary Tenure
- ◯ Public Property
- ◯ Lease (share-cropping)
- ◯ Not Applicable

4.2.3. Do women and men have separate plots?

- ◯ Yes, women and men have separate plots.
- ◯ No, women and men share the same plot.
- ◯ Not Applicable

Gender Mapping SSA Project (English)

4.2.4. What crops are grown in these plots? For each crop, answer the following:

	Crop	Gender Management of Production	For Consumption, Sale, or Both	Who Receives Sale Income	Who controls household consumption of this
1					
2					
3					
4					
5					

4.2.5. Indicate who makes decisions or performs the following tasks for these plots:

	Men	Women	Men and Women Together	Not Applicable
Making Money-Related Decisions (e.g. Buying Fertlizer)	◯	◯	◯	◯
Managing Labor Force (e.g. Hiring)	◯	◯	◯	◯
Planting	◯	◯	◯	◯
Seed Selection	◯	◯	◯	◯
Plowing	◯	◯	◯	◯
Pest control (e.g. Spraying fertilizers)	◯	◯	◯	◯
Irrigating	◯	◯	◯	◯
Weeding	◯	◯	◯	◯
Harvesting	◯	◯	◯	◯
Processing Crops for Consumption or Sale	◯	◯	◯	◯
Selling Products	◯	◯	◯	◯
Other	◯	◯	◯	◯

If other, please specify

Gender Mapping SSA Project (English)

Section 4: Farming Enterprises and Management

***FOREST AND WOODLOTS- land mostly under trees, used to harvest wood for fuel, lumber, as well as other non-timber forest products.**

4.3. According to the broad patterns in the area, are forest/woodlots a primary farm enterprise?

- ◯ Yes (If yes, please answer remaining questions in section 4.3)
- ◯ No (If no, click "next" at the bottom of the page)

4.3.1 What is the typical plot size (roughly in hectares) of the forest/woodlots?

- ◯ Less than 0.5
- ◯ 0.5-1.0
- ◯ 1-5
- ◯ 5-10
- ◯ Greater than 10

4.3.2. Who do the plots belong to?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Applicable

4.3.3. Under what kind of land tenure system are these plots held?

- ◯ Statutory (Legal title)
- ◯ Customary Tenure
- ◯ Public Property
- ◯ Lease (Share-cropping)
- ◯ Not Applicable

Gender Mapping SSA Project (English)

4.3.4. Do women and men have separate plots?

- ◯ Yes, women and men have separate plots.
- ◯ No, women and men share the same plot.
- ◯ Not Applicable

4.3.5. What activities take place in the forests/woodlots? For each activity, answer the following:

	Activity	Gender of Manager of Activity	For Personal Use, Sale or Both	Who Receives Income from Sale?	Who Controls Household Use and/or Consumption?
1					
2					
3					
4					
5					

4.3.6. Indicate who makes decisions or performs the following tasks for these plots:

	Men	Women	Men and Women Together	Not Applicable
Making Money-Related Decisions (e.g. Buying young trees/seeds)	◯	◯	◯	◯
Managing Labor Force (e.g. Hiring)	◯	◯	◯	◯
Planting	◯	◯	◯	◯
Pest control (e.g. Spraying fertilizers)	◯	◯	◯	◯
Harvesting	◯	◯	◯	◯
Processing Crops for Personal Use or Sale	◯	◯	◯	◯
Forest/woodlot management	◯	◯	◯	◯
Manage livestock grazing in woodlot/forest	◯	◯	◯	◯
Selling Products	◯	◯	◯	◯
Other	◯	◯	◯	◯

If other, please specify

Gender Mapping SSA Project (English)

Section 4: Farming Enterprises and Management

***PASTURES- an area covered with grass or other plants suitable for grazing livestock or gathering wild plants.**

4.4 According to the broad patterns in the area, are pastures a primary farm enterprise?

- ◯ Yes (If yes, please answer remaining questions in section 4.4)
- ◯ No (If no, click "next" at the bottom of the page)

4.4.1. What is the primary use(s) of the pasture land? (Please select all that apply)

- ☐ Grazing large and small livestock
- ☐ Gathering wild herbs, berries, nuts, and other wild crops
- ☐ Planting crops
- ☐ Other

If other, please specify

4.4.2. What is the typical plot size (roughly in hectares) of pasture area?

- ◯ Less than 0.5
- ◯ 0.5-1.0
- ◯ 1-5
- ◯ 5-10
- ◯ Greater than 10

4.4.3. Who does the pasture area belong to?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Applicable

Gender Mapping SSA Project (English)

4.4.4. Under what kind of land tenure system are these plots held?

- ◯ Statutory (legal title)
- ◯ Customary Tenure
- ◯ Public Property
- ◯ Lease (Share-cropping)
- ◯ Not Applicable

4.4.5. Do women and men have separate plots?

- ◯ Yes, women and men have separate plots.
- ◯ No, women and men share the same plots.
- ◯ Not Applicable

4.4.7. Indicate who makes decisions or performs the following tasks for these plots:

	Men	Women	Men and Women Together	Not Applicable
Making Money-Related Decisions (e.g. Buying Fertlizer)	◯	◯	◯	◯
Managing Labor Force (e.g. Hiring)	◯	◯	◯	◯
Harvesting or gathering	◯	◯	◯	◯
Managing animals	◯	◯	◯	◯
Processing Crops for Personal Use or Sale	◯	◯	◯	◯
Selling Products	◯	◯	◯	◯
Other	◯	◯	◯	◯

If other, please specify

Gender Mapping SSA Project (English)

Section 4: Farming Enterprises and Management

***LARGE LIVESTOCK- large, domesticated animals raised in an agricultural setting to use for food, fiber, or labor. Large livestock includes cattle, camels, buffalo, horses, etc.**

4.5 According to the broad patterns in the area, are large livestock a primary farm enterprise?

- ◯ Yes (If yes, please answer remaining questions in section 4.5)
- ◯ No (If no, click "next" at the bottom of the page)

4.5.1. What is the average herd size of large livestock in the farm enterprise?

- ◯ 1-2 animals
- ◯ 2-5 animals
- ◯ 5-10 animals
- ◯ More than 10 animals

4.5.2. Who owns the large livestock?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Applicable

4.5.3. Who decides what large livestock to purchase for the farm enterprise?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Applicable

Gender Mapping SSA Project (English)

4.5.4. What role do the household member(s) have in raising the large livestock in the farm enterprise?

	Livestock	Gender Management of Production	For Consumption, Sale, or Both	Who Receives Income from Sale	Who Controls Household Consumption
1					
2					
3					
4					
5					

If other, please specify

4.5.5. Who makes decisions or performs the following tasks for the large livestock?

	Men	Women	Men and Women Both	Not Applicable
Making money-related decisions (e.g. Purchasing feed)	◯	◯	◯	◯
Managing labor force (e.g hiring workers)	◯	◯	◯	◯
Cleaning sheds or barns	◯	◯	◯	◯
Feeding	◯	◯	◯	◯
Herd Management (e.g. animal health, grazing)	◯	◯	◯	◯
Animal feed preparation	◯	◯	◯	◯
Building and repairing shelter	◯	◯	◯	◯
Watering	◯	◯	◯	◯
Milking	◯	◯	◯	◯
Processing products for sale or consumption	◯	◯	◯	◯
Selling products	◯	◯	◯	◯
Other	◯	◯	◯	◯

If other, please specify

Gender Mapping SSA Project (English)

Section 4: Farming Enterprises and Management

***SMALL LIVESTOCK AND POULTRY- small, domesticated animals raised in an agricultural setting to use for food, fiber, or labor. Small livestock includes pigs, sheep, goats and poultry.**

4.6 According to the broad patterns in the area, is small livestock and poultry a primary farm enterprise?

- ◯ Yes (If yes, please answer remaining questions in section)
- ◯ No (If no, you will move automatically to the next section)

4.6.1. What is the annual average herd size of small livestock in the farm enterprise?

- ◯ 1-5 animals
- ◯ 5-10 animals
- ◯ 10-50 animals
- ◯ More than 50 animals

4.6.2. Who owns the small livestock?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Applicable

4.6.3. Who decides what small livestock to purchase for the farm enterprise?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Applicable

Gender Mapping SSA Project (English)

4.6.4. What role do the household member(s) have in raising the small livestock in this farm enterprise?

	Livestock	Gender Management of Production	For Consumption, Sale, or Both	Who Receives Income from Sale	Who Controls Household Consumption of This
1					
2					
3					
4					
5					

If other, please specify

4.6.5. Who makes decisions or performs the following tasks for the large livestock?

	Men	Women	Men and Women Together	Not Applicable
Making money-related decisions (e.g. Purchasing feed)	◯	◯	◯	◯
Managing labor force (e.g hiring workers)	◯	◯	◯	◯
Cleaning sheds or barns	◯	◯	◯	◯
Feeding	◯	◯	◯	◯
Herd Management (e.g. animal health, grazing)	◯	◯	◯	◯
Animal feed preparation	◯	◯	◯	◯
Building and repairing shelter	◯	◯	◯	◯
Watering	◯	◯	◯	◯
Milking	◯	◯	◯	◯
Processing products for sale or consumption	◯	◯	◯	◯
Selling products	◯	◯	◯	◯
Other	◯	◯	◯	◯

If other, please specify

Gender Mapping SSA Project (English)

Section 4: Farming Enterprises and Management

***FISHERIES AND AQUACULTURE- catching and/or cultivation of marine or freshwater fish/aquatic species.**

4.7 According to the broad patterns in the area, are fisheries/aquaculture a primary farm enterprise?

- ◯ Yes (If yes, please answer remaining questions in section)
- ◯ No (If no, you will automatically move to next section)

4.7.1. What is the average size of the catch per month in the farming enterprise?

- ◯ 1-10 fish or aquatic species
- ◯ 11-60 fish or aquatic species
- ◯ 61-100 fish or aquatic species
- ◯ More than 100 fish or aquatic species

4.7.2. What is the primary method(s) for gathering the fish and other aquatic organisms? (Please select all that apply)

- ☐ Raised in ponds or aquaculture
- ☐ Captured wild from surrounding bodies of water (e.g. streams, lakes, ocean)
- ☐ Both farm raised and captured wild
- ☐ Other

If other, please specify

4.7.3. Who owns the fishing enterprise and equipment?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Applicable

Gender Mapping SSA Project (English)

4.7.4. Who decides what to grow and what inputs to buy for the fishing enterprise?

- ◯ Male clan or lineage
- ◯ Female clan or lineage
- ◯ Men only
- ◯ Women only
- ◯ Men and Women together
- ◯ Not Applicable

4.7.5. What role do the household member(s) have in harvesting fish and aquatic species in the fishing enterprise?

	Fish Or Aquatic Species	Gender Management of Production	For Consumption, Sale, or Both	Who Receives Income from Sale	Who Controls Household Consumption of This
1					
2					
3					
4					
5					

If other (please specify)

4.7.6. What role do the household member(s) play in this fishing enterprise?

	Women	Men	Both Men and Women	Not Applicable
Making money-related decisions (e.g. buying feed)	◯	◯	◯	◯
Managing labor force (e.g. hiring)	◯	◯	◯	◯
Cleaning habitat	◯	◯	◯	◯
Maintaining and repairing equipment	◯	◯	◯	◯
Managing feed and other inputs	◯	◯	◯	◯
Catching and harvesting	◯	◯	◯	◯
Processing catch for sale or consumption	◯	◯	◯	◯
Selling product	◯	◯	◯	◯
Other	◯	◯	◯	◯

If other, please specify

Gender Mapping SSA Project (English)

Section 5: Gender Roles

Instructions: Answer the following questions based on the trends over the past 10 years.

5.1. In your opinion, how have the main sources of livelihoods changed, or are changing, for men and women? Please describe.

5.2. In your opinion, how have the gender roles changed, or are changing, in your area? Please describe.

5.3. Has there been significant migration in or away from this area? If yes, what impact has this had on gender roles in the farming enterprise?

Thank you for responding to our survey. We are constantly working to improve this survey, so if you have any feedback, please provide it below.

***As a token of our appreciation for your input, we are offering a hard copy of the book "Household Decisions, Gender and Development: A Synthesis of Recent Research" provide your mailing address if you would like the book**

- ◯ Yes, I would like the book sent to me
- ◯ No, I would not like the book sent to me

Gender Mapping SSA Project (English)

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