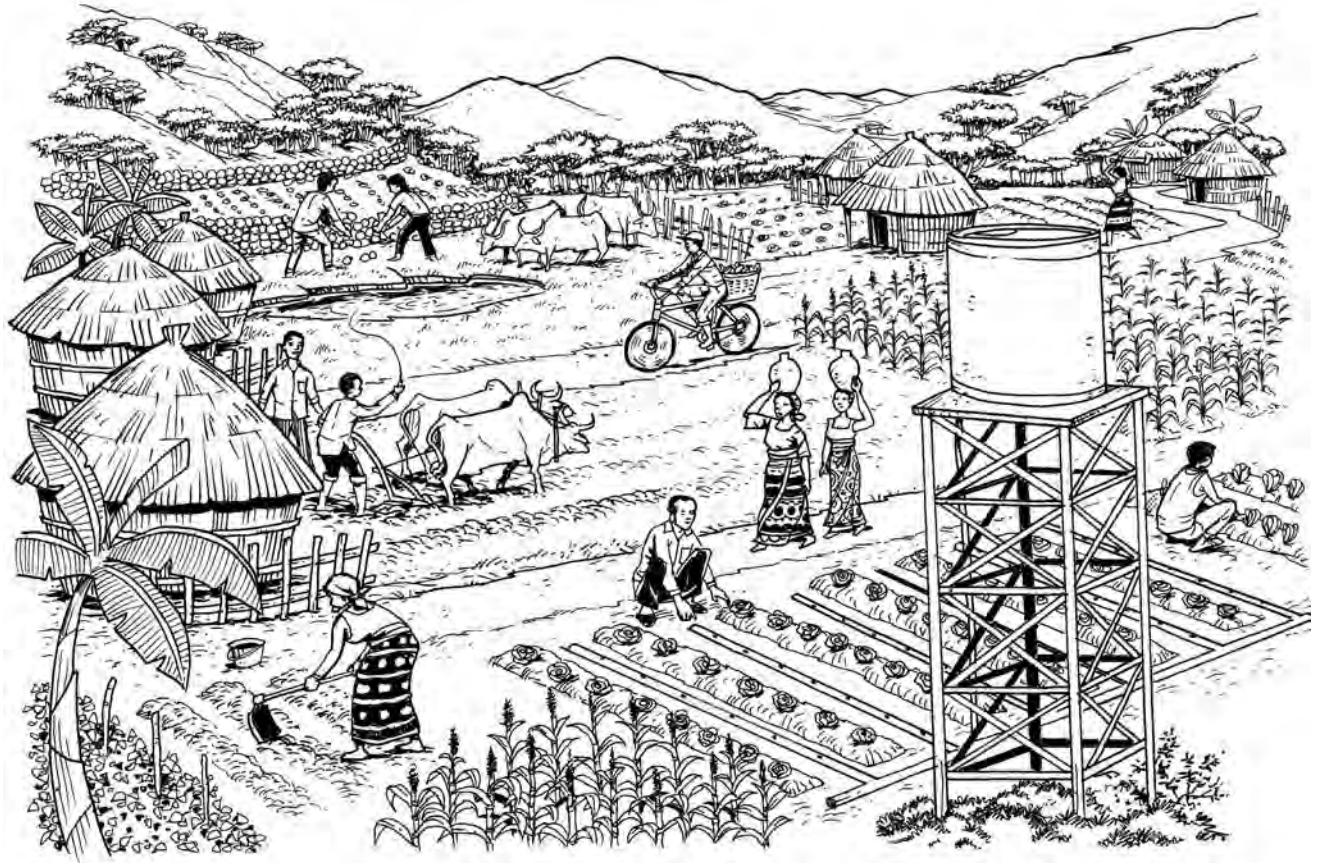


# Putting Gender on the Map: Methods for Mapping Gendered Farm Management Systems in sub-Saharan Africa



**G**ender 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. 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, van Koppen 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) geo-referencing 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.

## 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 *et al.* 2002, 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 *et al.* 2009,

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 *et al.* 1995; 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 *et al.* 1997; Hallman 2000; Quisumbing and Maluccio 2003; Skoufias 2005; Fafchamps *et al.* 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 *et al.* 1997, 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 *et al.* 1994; 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 *et al.* (2001), 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.

## 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. In almost all cases, these households are either de jure female headed, in which women are 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 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).

## Source

*Putting Gender on the Map  
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