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## Who claims the rights to livestock? Gendered patterns of asset holdings in smallholder households in Uganda

Marya Hillesland<sup>a</sup>, Cheryl Doss<sup>a</sup>, Vanya Slavchevska<sup>b</sup> and Martina Querejeta<sup>c</sup>

<sup>a</sup>Oxford Department of International Development, University of Oxford, Oxford, UK; <sup>b</sup>Inclusive Rural Transformation and Gender Equality Division (ESP) of the Food and Agriculture Organization of the United Nations (FAO), Rome, Italy; <sup>c</sup>Economics Department, Faculty of Economics and Administration, Universidad de la República, Montevideo, Uruguay

### ABSTRACT

Although data on livestock ownership are often collected at the household level, not all household members have the same rights over the livestock. In this paper, we investigate the gendered patterns of livestock ownership in smallholder households in Uganda using a unique data set with information on ownership, management, and decision-making across different types of livestock. Drawing on the bundle of rights frameworks, the analysis demonstrates the importance of going beyond analyses of ownership to also consider these other rights. We find that people who claim to be owners may not have the management or fructus rights. People also may have these latter rights without claiming ownership. We also find discrepancies in the responses from spouses; they provide different answers regarding who owns and has the rights over livestock. This suggests patterns of asymmetric information and potentially the hiding of animals from one's spouse.

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## Introduction

Women's ownership of assets affects their economic empowerment and their ability to engage in more profitable livelihood strategies. Through greater negotiating capacity or bargaining power within the household, women's improved asset ownership has been shown to result in greater household food security and improved outcomes for children (Fafchamps et al., 2009; Quisumbing, 2003; Quisumbing & Maluccio, 2003). Much of the focus has been on land and financial assets. Yet for rural women, especially those in low- and middle-income countries, livestock are important productive assets. For women in developing countries, livestock are often easier to acquire and maintain control over than land and financial assets (Kristjanson et al., 2014; Rubin et al., 2010). Livestock can help meet the household's dietary needs by supplying milk from dairy cows or goats, eggs from poultry, and meat. Livestock can also generate

income, either through the sales of these products or through the sale of the offspring (Galiè et al., 2022). Some livestock can be used for tilling, irrigation, and carting on the household farm. Manure can be used as a fertilizer for cropping activities or used as a cooking fuel. Livestock can also be used as a form of savings to be sold when cash is needed in the case of emergency (Galiè et al., 2015; Simiyu & Foeken, 2013). While there is now extensive quantitative data on women's ownership of land and financial assets, there is much less on women's ownership of livestock and even less on how ownership and other rights are distributed between women and men in the same household.

Within the household, women and men may own different types of livestock. While the patterns vary across contexts, numerous studies find that women are more likely to own smaller livestock and poultry than to own cattle and other large livestock (Dumas

**CONTACT** Cheryl Doss  [cheryl.doss@qeh.ox.ac.uk](mailto:cheryl.doss@qeh.ox.ac.uk)  Oxford Department of International Development, University of Oxford, 3 Mansfield Rd, Oxford OX1 3TB, Oxford, UK

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et al., 2018; Guèye, 2000; Njuki & Sanginga, 2013; Simiyu & Foeken, 2013) and men are more likely to own larger livestock. But ownership may be an elusive concept, since men and women may have different understandings of ownership, and reports of ‘ownership’ do not necessarily correspond to rights over the livestock. Galiè et al. (2015) investigate men’s and women’s perceptions of ‘*what it means to own livestock*’ using qualitative approaches in communities in Ethiopia, Tanzania, and Nicaragua. They explore various criteria such as ‘who contributes most labor in the management of livestock’, ‘who sourced it’, and ‘who controls the revenues.’ They argue that it is important to distinguish between ownership, access, and control, and that ownership may take on different meanings depending on the person’s position within the household (Galiè et al., 2015). Drawing on the bundle of rights framework, we extend beyond livestock ownership to consider a broader range of rights.

While there are different typologies of rights, they are commonly grouped as ‘use or access’ rights, such as the right to live in a house or use an ox to plough a field, and ‘control or decision-making’ rights, such as the right to decide what crops to plant, where to graze livestock, or to sell a piece of jewelry and use the money for a daughter’s education (Meinzen-Dick et al., 1997; Schlager & Ostrom, 1992). It can be useful to disaggregate control and decision-making rights further into management and fructus rights. Management includes regulating the asset’s use and, for livestock, would include overseeing their care. Fructus rights are the rights to benefit from the asset. This may include the right to decide whether to consume the milk, eggs, and other products from the livestock at home or to sell them in the market. Our understanding of property rights goes beyond identifying the legal rights. It recognizes that many different factors, such as social norms and intrahousehold dynamics, mediate rights to an asset and that simply identifying who owns the livestock misses other key dimensions.

Researchers working on gender issues have used a rights framework to demonstrate that men and women may hold different rights regarding natural resources (Kristjanson, 2022; Meinzen-Dick et al., 1997). More recently, researchers have empirically explored the associations of these different rights regarding land using nationally representative data across countries (Slavchevska et al., 2020).

Using a bundle of rights framework, this study investigates the patterns of ownership, management

and rights over livestock in rural households in Uganda using a unique data set in which both the husband and wife were interviewed privately about who owns and makes the decisions regarding livestock production and use. The survey was collected under a Food and Agricultural Organization of the United Nations (FAO) project to develop relevant gender indicators for agricultural and household surveys. The analysis investigates whether self-reported ownership is associated with the management and fructus rights for men and women. In addition, we compare the responses of husbands and wives within each household to identify the patterns of discrepancies in responses.

The study makes two contributions to the literature. First, it contributes to the literature that explores the gendered patterns of asset ownership with a detailed quantitative analysis of livestock ownership, management and fructus rights. We highlight the importance of going beyond simply asking about ownership of livestock to document a broader set of rights over the animals. We focus on identifying who has the rights over the livestock, rather than who provides the labour for the care of the animals. While the labour contributions regarding livestock are important, they have been much more extensively studied.

Second, it contributes to the growing literature on what we learn about asset ownership and rights from analysing responses to household survey questions from different household members (Ambler et al., 2017; Hillesland et al., 2020; Jacobs & Kes, 2015; Kilic & Moylan, 2016). While much of this literature analyses the extent to which spouses agree on whether the wife has rights over the asset, we also consider their responses regarding the rights of the husband. We extend these analyses to analyse spousal agreement on the full bundle of rights for different types of livestock. We discuss the implications for the patterns of discrepancy that we find.<sup>1</sup>

## Review of gendered patterns of livestock ownership

Much of the literature on gender within the livestock sector focuses on one or two dimensions of ownership. For example, the recent FAO report on the Status of Women (2023) identifies the incidence of men and women owning livestock in six African countries but does not identify other rights.

Another strand of the literature on gender and livestock focuses on the gendered patterns of labour

used to care for livestock (Bain et al., 2018; Dumas et al., 2018; Tavenner et al., 2018). It demonstrates that women are actively involved in caring for livestock, particularly in livestock feeding (Harris-Coble et al., 2022) and the physically demanding task of harvesting fodder and forages (Njuguna-Mungai et al., 2022), and that interventions in the livestock sector must consider the labour provided by women. We bring in additional dimensions by considering who has the rights over the livestock.

There are different factors that could influence rights over the livestock within the household. One is that the rights over livestock within the household may depend on who acquired the animals and the means they used. A study focused on the Nandi in the Rift Valley Province, Kenya, finds that cattle inherited and bequeathed through the male lineage are passed on to sons. Women have more power to insist on their fructus rights and rights to bequeath over cattle gifted from relatives at marriage or those they purchased themselves. Women have the fewest rights over cattle purchased by men (Oboler, 1996). Similarly, women in East and Southern Africa are more likely to consider themselves an owner of livestock if they purchase the livestock with their own income or receive it individually as a grant from a development programme (Njuki & Sanginga, 2013).

Rights may be influenced by intrahousehold dynamics and social norms in a way that women's ownership does not necessarily translate into full rights over the animals (Njuki et al., 2011; Ransom et al., 2017; Valdivia, 2001). Particularly in settings where men are assumed to own all of the household's property, husbands often claim ownership rights even when their wives purchased the livestock themselves (Dumas et al., 2018; Njuki & Sanginga, 2013; Simiyu & Foeken, 2013). If the marriage dissolves, husbands are likely to claim ownership over all the livestock regardless of who owns it and how it was acquired. As one woman expressed in a study in rural Kenya: '... what belongs to a woman really belongs to the man .... For the bigger livestock like sheep, goats, and cows, the ownership is with the man, even if I'm the one who bought it, because if you disagree and have to leave his home, you won't go with the sheep' (Dumas et al., 2018).

Rights to the livestock within the household may change. Men may use their power to claim greater rights over livestock as activities become commercialized and more profitable (Kristjanson et al., 2014). As the profitability of livestock and products from

livestock increases, women often become less likely to control the activities and income (Njuki et al., 2011; Quisumbing et al., 2015). This is consistent with earlier studies that find that as agricultural activities become more profitable, men tend to take them over (Doss, 2002; Von Braun & Webb, 1989).

There are mixed findings on whether providing the labour of the livestock results in greater rights over the livestock. Simiyu and Foeken (2013) find that in Eldoret, Kenya, men and women were less likely to consult their spouse regarding livestock market activities when they considered that their own labour input gave them rights over the animals. Studies suggest that those who care for the livestock are more likely to claim rights over the products in Nicaragua, Tanzania, and Ethiopia (Galiè et al., 2015). But providing the care did not necessarily mean that the women claimed ownership of the animals themselves in either in Tanzania or Uganda (Galiè et al., 2015; Ransom et al., 2017).

One way to safeguard one's rights over livestock is to limit information about livestock activities. For example, Eldoret, Kenya husbands often did not consult their spouses about selling livestock, possibly as way to hide the sale, if they did not want to split the income received from the animal (Simiyu & Foeken, 2013).

Spouses may not tell each other about all of the animals they own. Field staff collecting the data for this project in Uganda noted that men and women sometimes keep livestock at friends' households. In Nyanza Region, Kenya, women 'lend' livestock to other women (Dumas et al., 2018). Women lending livestock to other women may indicate a form of 'hiding' to secure rights to livestock. It may prevent husbands from selling the animals. It may also be a way for women to ensure that they can retain the livestock in the event of household dissolution through divorce or the death of their husband. Other research finds evidence of men and women hiding financial assets (Ashraf, 2009; Castilla & Walker, 2013; Fiala & He, 2017; Hoel, 2015).

We use a unique data set to analyse how husbands and wives respond to questions about the rights that they have over livestock. We have data on the full bundle of rights that each of them holds, based on the answers that they give themselves separately, rather than using a proxy respondent. We not only are able to look at the gendered patterns, but also to analyse when the answers that spouses give are inconsistent. A now extensive literature demonstrates

spouses often provide different answers when asked the same survey questions (Ambler et al., 2021, 2022; Anderson et al., 2017; Deere & Twyman, 2012; Hillesland et al., 2020). While some of the discrepancies may be simply a result of measurement error, we often see systematic gender differences in responses. These different responses may reflect men's and women's different roles and responsibilities in the household (Matheson & McIntyre, 2014). Even if husbands and wives have the same information, their responses may differ if they decide to respond in ways that are seen as socially desirable (Matheson & McIntyre, 2014). Men and women may also interpret the questions differently (Kriel & Risenga, 2014). A further explanation may be that there are information asymmetries within the households. People may not know about the assets belonging to other household members (Jacobs & Kes, 2015). Ambler et al. (2021) highlight asymmetric information as a reason for conflicting spousal responses to survey questions about asset ownership and decision-making and provide a framework for analysing the reasons for spousal disagreement regarding asset ownership and household decision-making.

With some exceptions, much of the quantitative literature about gender and livestock relies on proxy respondents, in other words, one member of the household provides information about the ownership and rights of everyone in the household (e.g. Tavenner et al., 2018). One exception are studies that use the Women's Empowerment in Livestock Index (WELI) (Galiè et al., 2019). However, while the WELI is designed to solicit self-responses from men and women within the household and includes questions about the input that the respondent has into decisions about the two main types of livestock owned by household, it does not ask specifically about ownership across all types of livestock.

This study highlights the complexity of rights over livestock within the household. Conflicting responses about who holds these rights may hint that there is asymmetrical information. If ownership and rights over livestock are insecure within a household, 'hiding' livestock may be a way to better ensure fructus rights particularly if the animals are used as a form of savings.

## Data and methodology

The data for the study comes from a field-test survey that was administered to households in three districts

in Uganda: Bukedea, Kamuli, and Buikwe, as part of the Global Strategy to improve Agricultural and Rural Statistics (GSARS).<sup>2</sup> Households in this area are agro-pastoralists involved in mixed livestock and crop farming (FAO, 2018b).

The initial sample consisted of 510 agricultural households from 30 randomly selected enumeration areas (EAs) with 17 households per EA. A complete listing of households in each EA was done prior to sampling and survey implementation. In 318 households, the enumerators interviewed two people. In 275 of these households, the two interviewees were the husband and the wife. In the 192 households where only one person was interviewed, this was because the respondent was divorced, separated, or widowed or because the spouse was away from the village for work or lived in another household. For this analysis, we use the 275 households where the husband and the wife were both interviewed and responded to the questions on livestock.

The survey had two components. First, a household questionnaire included a household roster and questions about the household. In addition, an individual questionnaire included detailed questions on livestock ownership and decision-making about livestock. The household questionnaire and the first part of the individual questionnaire were administered by two enumerators with both respondents in the same room. One enumerator interviewed the respondents and both enumerators recorded the information. Each enumerator then interviewed one member of the couple in separate locations to limit the influence the other had on the responses. These were administered privately whenever possible.

In the individual surveys, each respondent was asked whether the household currently has any of the following types of livestock: local and improved cattle, local and improved goats, sheep, pigs, chickens, and other poultry (ducks, turkeys, guinea fowl, doves, pigeons), horses, donkeys and mules, rabbits, and beehives. They were asked to include animals regardless of whether they were held on the household farm or at another household. This study focuses on cattle, goats, sheep, pigs, and poultry; fewer than 1% of respondents claimed that the other types of animals were on the holding. If the respondent says that the holding keeps livestock, he or she is asked how many of each livestock type the household has.

Finally, the respondent is asked whether he or she currently owns any of the animals of each livestock type, either exclusively or jointly with someone on or off the holding. For each type of animal, we categorize the respondent as an exclusive owner if they own all of that type of animal exclusively. This means they do not report that anyone else in the household owns any livestock of that type and they do not list anyone else as joint owners of any of these animals. We do not ask each respondent about their ownership of each individual animal, but instead we ask about their ownership of each type of animal.

To analyse the rights over livestock, we differentiate between management and fructus rights. The survey directly asks who manages the livestock and

the enumerator's manual defines managers as the individuals who are responsible for the financial aspects of the livestock and for ensuring the proper care and feeding of animals. It may include providing care themselves or supervising others in the care of the animals. Thus, this is not a question about who provides the labour, but who is responsible for making the higher-level decisions about the animals. To understand fructus rights, we analyse the decisions made over the use of livestock and livestock by-products for home consumption (rights over the output for home consumption) and decisions over the sale of a whole animal or animal products (rights over

**Table 1.** Mapping survey questions to rights over livestock.

Rights	Survey questions
Ownership	Do you currently own [livestock type] exclusively or jointly with someone on or off the holding?
Management	Who manages [livestock type]?  Since the beginning of the last rainy season, were any products produced from [livestock type] consumed in the household or used on the holding? (Examples include milk from dairy cows, eggs from poultry, wool from sheep, and using manure as fertilizer.) Who made the decisions regarding which products from [livestock type] to consume at home or to use on the holding?
Rights over the output for household consumption (fructus rights)	Since the beginning of the last rainy season, were any [livestock type] slaughtered for home consumption? Who made the decision to slaughter [livestock type] for home consumption?
Rights over market activities (fructus rights)	Since the beginning of the last rainy season, were any products produced from [livestock type] sold for cash or bartered? Who made the decisions on which products produced from [livestock type] to sell or trade?  Since the beginning of the last rainy season, were any [livestock type] sold? Who made the decision to sell [livestock type]?

**Table 2.** Characteristics of the agricultural households.

	Mean	Median	Min	Max
Household size		6.6	7.0	2 16
Husband's age		44.8	42.0	18 95
Wife's age		37.1	34.0	18 90
Land the household holds or owns (hectares)*		1.4	0.9	0 15
Land the household cultivated (hectares)*		0.6	0.1	0 10
Number cattle the household owns		1.2	0.0	0 20
Number goats and sheep the household owns		1.4	0.0	0 11
Number pigs the household owns		0.9	0.0	0 15
Number poultry the household owns		8.1	6.0	0 60
Household tropical livestock unit**		1.2	0.7	0 15
Percent of households				
Since the beginning of the agricultural season:				
Crops were sold		64		
Animals were sold		35		
Eggs, milk or other livestock products were sold		19		
Household dwelling floor				
Earth dirt or sand		71		
Cement or concrete		29		
Household lighting source				
Electricity		30		
Paraffin-lantern or tadooba		54		
Other		16		
Sanitation				
Flush toilet		0		
Improved latrine		40		
Unimproved or traditional latrine		53		
None		7		

Source: Calculated by the authors. Notes: \* Land held or owned by the household are parcels acquired from village leader, inherited, purchased, or gifted. Most parcels held or owned by these households are inherited or purchased. The excluded categories include land that is leased, rented in, moved in without permission, borrowed, or allocated to the household by a family member. Parcels that are not owned are primarily allocated to the household by a family member or land that is rented in. \*\* The tropical livestock unit is weighted sum of all animals: cattle = 0.7, Goats = 0.1, Sheep = 0.1, pigs = 0.2 and chicken = 0.01 using Otte and Chionda (2002). The estimates of the crops sold, animals sold, and livestock products sold are based on the husband's responses. Based on couple sample of 275 households.

market activities). Table 1 maps the survey questions to the activities and rights.

Many households in the survey are poor smallholder households (Table 2). According to the Uganda Bureau of Statistics, smallholder farmers are ‘those who usually cultivate less than one hectare of land, in a cropping season, practice labour intensive farming using rudimentary technology especially the hand hoes, own a few heads of cattle, and produce mainly for family consumption, with a limited surplus for the market’ (Atube et al., 2021). Although many of these households engage in the markets, they are primarily farming for subsistence rather than commercial purposes. Within our sample, the median area of land owned or held by the household is 0.91 hectares and the median area cultivated is only 0.13 hectares. While nearly 90% of the households own livestock, most own a few animals, with a mean Tropical Livestock Unit (TLU) of 0.72, which is about one cow, seven sheep, or 20 fowl.<sup>3</sup> Few households have large herds. There are only 12 households with a TLU of six or more.

The study employs detailed descriptive statistics to examine the gendered relationship between ownership and the broader set of rights over livestock within smallholder households in Uganda. The first part of the analysis considers the gendered patterns of ownership using husband’s and wife’s own reports of whether they own animals. We then consider the management and other fructus rights, disaggregating by whether or not the respondent claims to own the animals.

In the second part of the analysis, we combine the responses of each husband-and-wife pair and analyse the discrepancies in their responses. Drawing on the framework by Ambler et al. (2021), we consider whether the discrepancies are due to random measurement error, asymmetric measurement error, or other factors such as asymmetric information. If due to random measurement error, then we would expect the discrepancies would be symmetric across men and women. In other words, when we are analysing whether or not both husband and wife say the wife has the ownership rights over cattle, we would expect that it would be as likely that the discrepancy was that she said that she did have the rights and he said that she did not as that it was the opposite, she said that she did not and he said that she did. Asymmetric measurement error would be that men and women understood the question differently or that they had different ideas of what it means to own (or manage) livestock. In this case, we might see that it

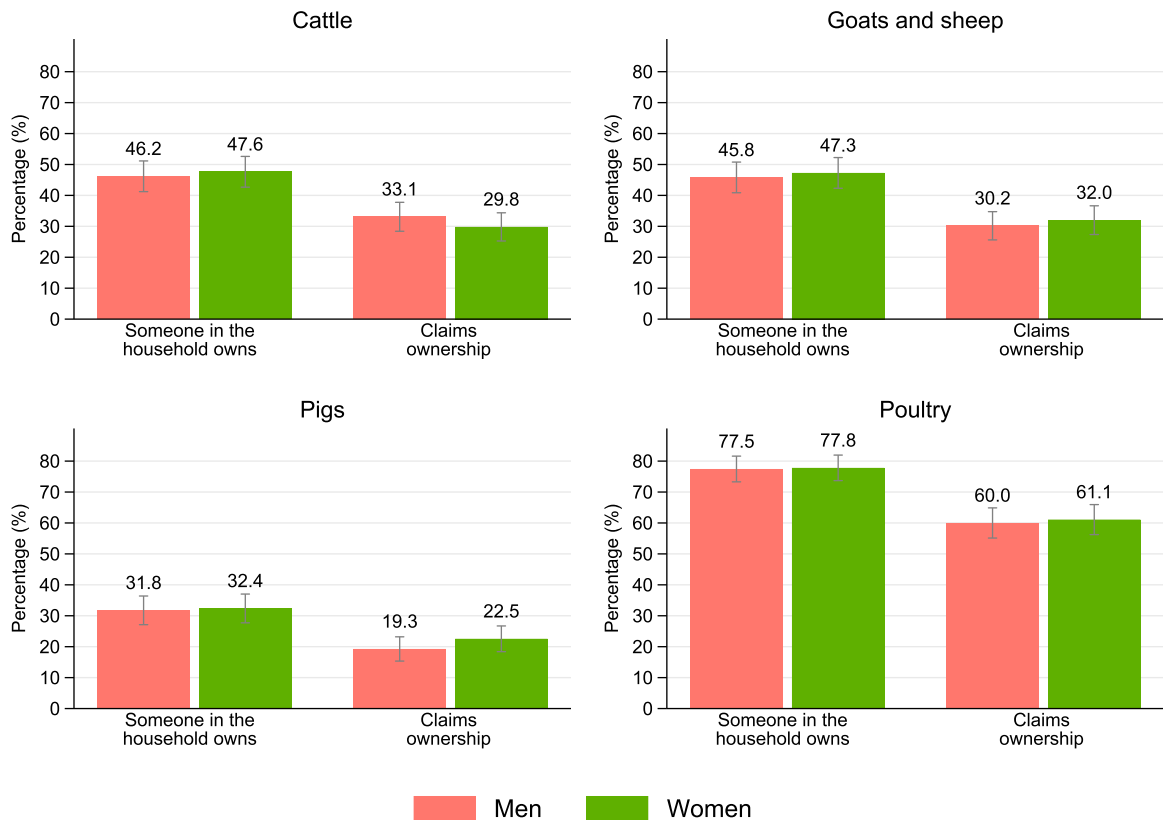
was more likely that women said that they owned the livestock, but their husband said that they did not, but the discrepancies would be equally likely across types of livestock. If we reject that it is random and systematic measurement error, this means other factors are at play, including the possibility that spouses are not privy to the same information.

### Gendered patterns of ownership, management, and fructus rights

Figure 1 presents the responses of men and women to questions about livestock ownership. The figure is based on the responses by the men and women themselves about their ownership; it does not rely on a proxy respondent who reports on the ownership and rights of their spouse. The figure shows the incidence measures, which are the percentage of women and of men in our couple sample who say the household owns the particular type of livestock and the percentage of women and of men who claim that they are an owner. There are no statistically significant differences in whether men and women say that the household owns any particular type of livestock (based on the 90% confidence intervals). Nor are there statistically significant differences in the incidence of men and women reporting they own the various types of livestock.

The stylized fact that women are less likely than men to own large livestock but more likely than men to own poultry and small ruminants is not visible in our couple sample. However, note that this is only an indicator of whether men and women are livestock owners, not about how many livestock they own. There may be large and significant differences in the number of each type of livestock men and women own. Given our focus on intrahousehold patterns using a couple sample, we do not pick up other potential patterns such as differences in livestock ownership between households headed by men and women. Studies that look at gender differences in livestock ownership using responses from men and women from different households may actually pick up differences in household socio-economic status and position of respondents to the head rather than differences attributable to the gender of the respondent.

When the different types of livestock, such as improved cattle and local cattle breeds are aggregated as they are in Figure 1, most herds or flocks within the household have more than one owner, and there are no statistically significant differences between men



**Figure 1.** Incidence of livestock ownership, by gender of respondent, form of ownership, and livestock type. Source: Calculated by the authors. Notes: The figures show the incidence based on the responses to answers to the questions: 'Does the household currently have any [livestock type] as part of the holding?' and 'Do you currently own [livestock type] exclusively or jointly with someone on or off the holding?' Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds. Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons). Ninety per cent confidence interval represented as vertical lines. Based on couple sample of 275 households.

and women owning these livestock jointly across the size of the herd. When we disaggregate by type of cattle, however, men are statistically significantly more likely to own improved cattle (as opposed to the local breeds) than women. Of the 20% of men who own improved cattle, slightly more than half of these men claim they own the cattle exclusively. Of the 19% of women who own improved cattle, only one-fourth of these women own cattle exclusively. We do not see statistically significant differences between men and women's exclusive ownership across the other livestock types.

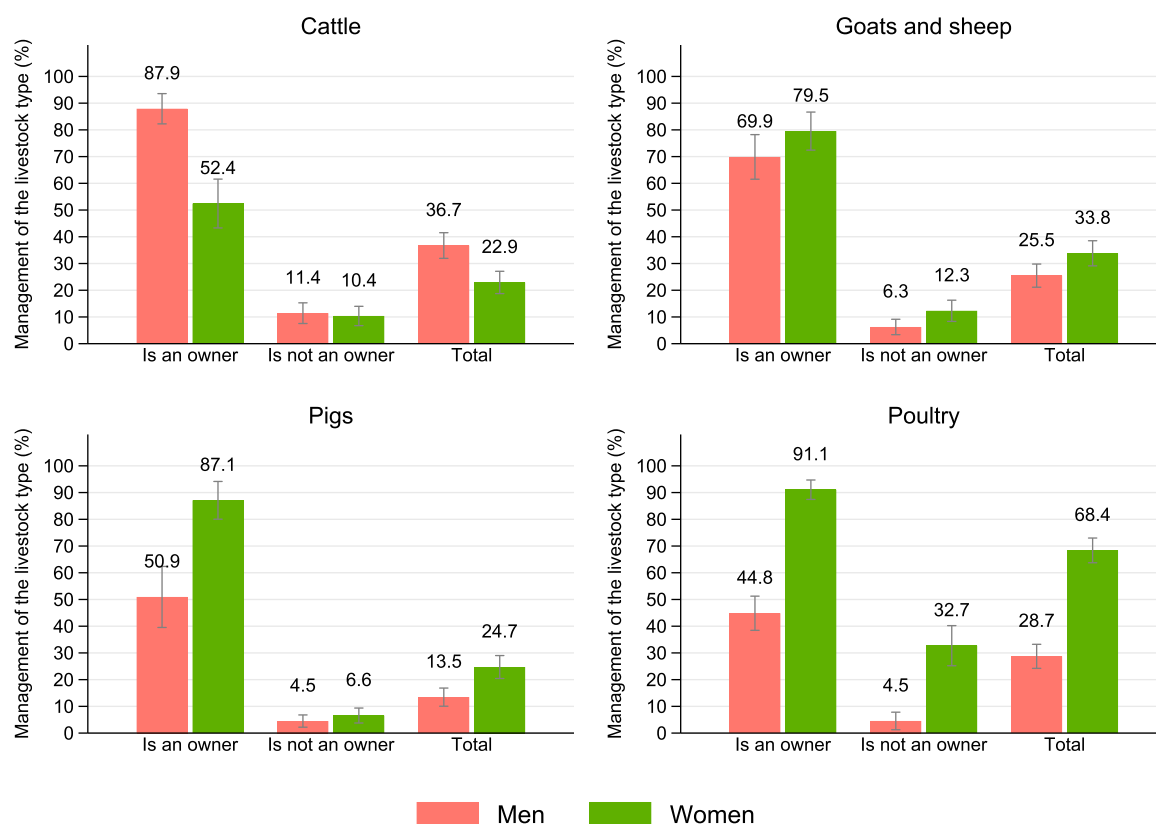
The gender differences are more pronounced in the management of livestock (Figure 2). More men than women manage cattle, while the opposite is true for pigs and poultry. The gender gap in livestock management is most pronounced for poultry – 68% of women compared to only

29% of men report managing poultry and is not necessarily the owners of the animals who manage them.

There are also gender differences in the other rights over livestock. Figures 3 and 4 present the patterns of men's and women's fructus rights by comparing the incidence of men and women claiming that they make decisions about home consumption and marketing activities.<sup>4</sup>

More men than women claim they make decisions about home consumption and marketing activities of all livestock except poultry. Although many of these gender differences are not statistically significant in our sample, the lack of significance could be due to the relatively small sample size.

The only statistically significant differences between men and women in the couple sample are the rights to home consumption of milk, eggs, and



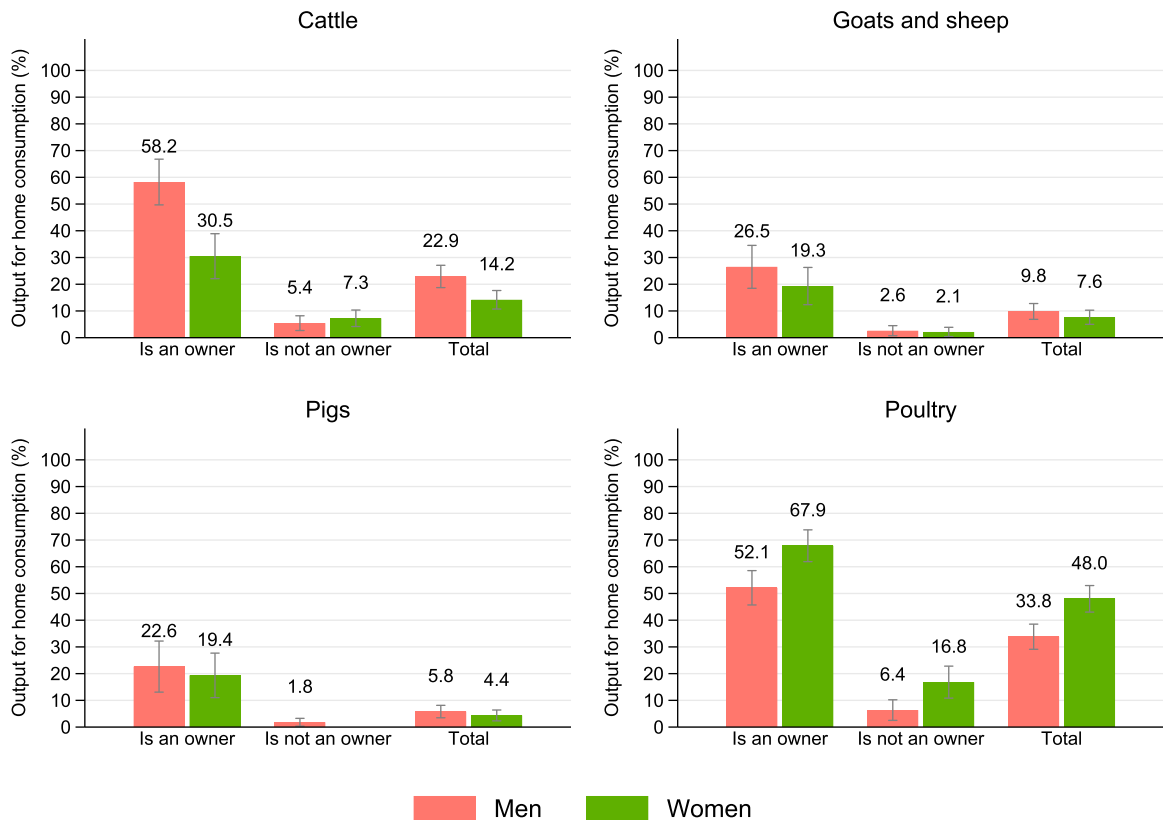
**Figure 2.** Incidence of livestock management, by gender of respondent, ownership status, and livestock type. Source: Calculated by the authors. Notes: The figures show the incidence based on the responses to the question: 'Who manages the [livestock type] on the holding?' Percentages conditional on owning and not owning [livestock type] are reported along with the percentage over the total sample. Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds; Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons). Ninety per cent confidence interval represented as vertical lines. Based on couple sample of 275 households.

meat from cattle and poultry. Men are more likely to claim the rights over the output for consumption for cattle, whereas women are more likely to have these rights for poultry.

Rights over consumption and marketing activities appear to be strongly associated with ownership. The most striking gender gaps are with regards to cattle. Nearly 60% of men who own cattle compared to only 31% of women who own cattle report making decisions over products from cattle (e.g. milk) for home consumption. The percentage of people reporting they make decisions about market activities for cattle are smaller than those making decisions about home consumption, but again these are dominated by men. Among owners, 24% of men compared to only 15% of women report making decisions over market activities, although it is not statistically significant. Nonetheless, cattle are clearly in the domain of men and ownership

does not necessarily confer the same rights for women as it does for men.

While a larger share of women compared with men manage goats, sheep, and pigs (Figure 2), decisions over the consumption and sales of these livestock and livestock by-products appear to be dominated by men (Figures 3 and 4). Fewer women than men report deciding about home consumption and market activities for these livestock, regardless of whether they are owners, with the exception of poultry. As mentioned earlier, more women than men claim they make decisions about home consumption of poultry, both among owners and nonowners. About 68% of women who own poultry report having rights over the output for home consumption as compared to 52% of men who own poultry. Similarly, a higher incidence of women who are not owners of



**Figure 3.** Incidence of rights over the output for home consumption, by gender of respondent, ownership status, and livestock type. Source: Calculated by the authors. Notes: The figures show the incidence based on the responses to the questions: 'Who made the decisions regarding which products from [livestock type] to consume at home or to use on the holding?' and 'Who made the decision to slaughter [livestock type] for home consumption?' Percentages conditional on owning and not owning [livestock type] are reported along with the percentage over the total sample. Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds; Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons). Ninety per cent confidence interval represented as vertical lines. Based on couple sample of 275 households.

poultry report making decisions about home consumption.

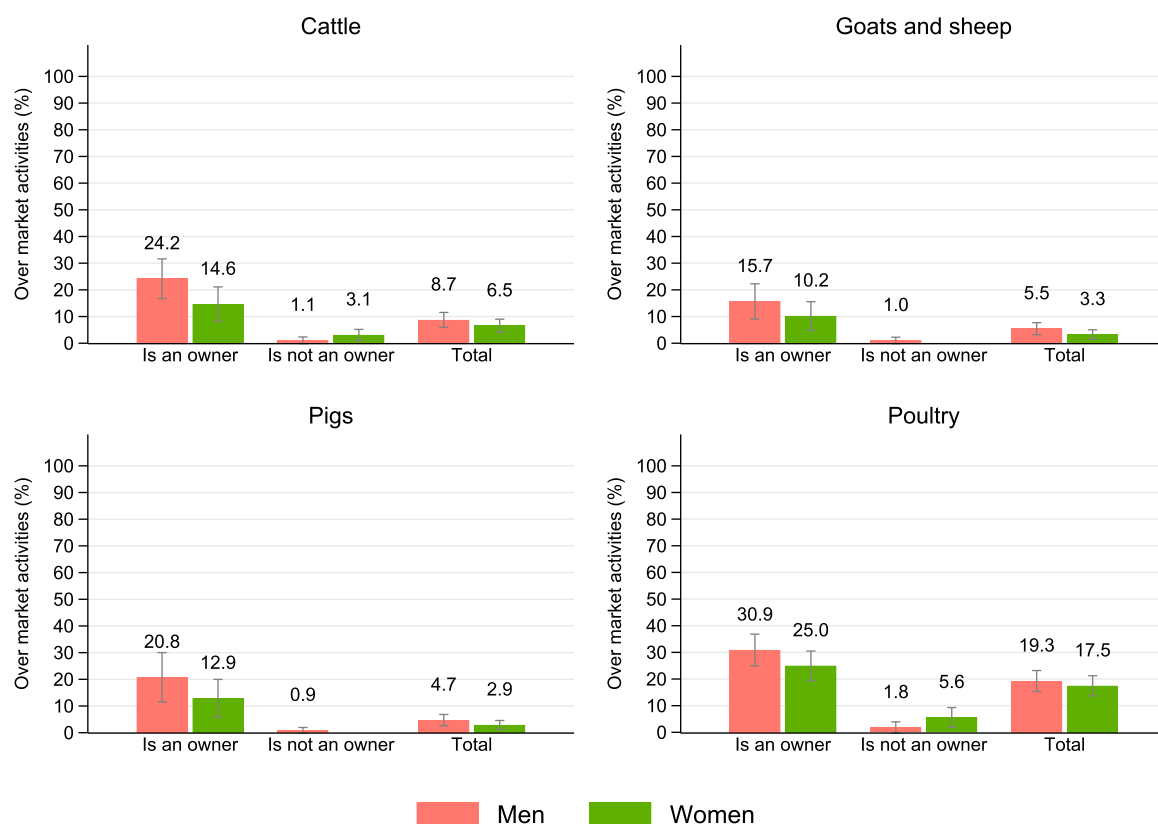
Men, however, are more likely than women to claim they make decisions about the market activities regarding poultry. Thirty-one per cent of men who claim ownership over the poultry report making decisions over the market activities compared to 25% of women. But more women than men who are not owners report making decisions over market activities. Although these gender differences are large, in our sample, the differences in rights to market activities are not statistically significant.

These patterns highlight the complexity of defining ownership with respect to livestock – ownership is strongly correlated with management and fructus rights, but to a greater extent for men than

women. Yet, ownership does not always confer management and fructus rights as evidenced by the fact that owners, especially women owners may not always manage their livestock themselves. At the same time, ownership of livestock is not a prerequisite for respondents to claim these other rights.

### Intrahousehold discrepancies regarding ownership and rights of livestock

The first part of our analysis considers the gendered patterns of rights over livestock for men and women, using a couple sample where we have responses from both the husband and wife. The analysis is simply comparing men and women within this sample. In this section, we add in an



**Figure 4.** Incidence of rights over market activities, by gender of respondent, ownership status, and livestock type. Source: Calculated by the authors. Notes: The figures show the incidence based on the responses to the questions: 'Who made the decisions on which products produced from [livestock type] to sell or trade?' and 'Who made the decision to sell [livestock type]?' Percentages conditional on owning and not owning [livestock type] are reported along with the percentage over the total sample. Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds; Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons). Ninety per cent confidence interval represented as vertical lines. Based on couple sample of 275 households.

intrahousehold dimension, matching the responses of each husband-and-wife pair to identify whether or not they are providing consistent answers. Discrepancies in their responses regarding rights may indicate there is measurement error, asymmetric information between the spouses, or that the rights are contested.

We find some discrepancies in reports by spouses regarding the number of animals belonging to the holding (Table 3). For cattle, goats and sheep, and pigs, spouses reported the same number of animals in over three-quarters of the households. When there is a discrepancy, it is more likely the wife reported more animals than her husband. For poultry, spouses reported the same number in only 35% of the households. In 27% of the households, wives reported more poultry than husbands (with an average difference of nearly seven fowl.) When

husbands report more fowl than their wives report, the average difference is five fowl.

While we saw above that cattle are more likely to be owned and managed by men, intrahousehold discrepancies in the numbers of cattle owned are more likely a result of women reporting larger numbers than men, rather than vice versa. The opposite is true for poultry; women are more likely to be the managers, but men report the household has larger numbers of poultry than their wives. We would expect managers to be better informed on the actual numbers, suggesting asking someone other than the manager may bias the number of livestock reported upwards.

Another reason for the discrepancy in the number of livestock reported by husbands and wives may be that some livestock is held at other households. Observations from the field suggest that people may keep

**Table 3.** Distribution of households by spousal reporting on number of livestock the household owns (%).

	Cattle	Goats and Sheep	Pigs	Poultry
Wife reports household owns more than husband reports	16	12	10	27
Report the same number	77	77	83	35
Husband reports household owns more than wife reports	8	10	7	39
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated by the authors.

Notes: The table is based on the responses to the question 'How many of [livestock type] does the holding have?' This includes all households regardless of whether they have the livestock type of not ( $N = 275$ ). Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds; Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons).

**Table 4.** Distribution of households by location of the livestock (%).

	Cattle	Goats and Sheep	Pigs	Poultry
<b>Wives' responses</b>				
Only in own household	44.4	45.1	31.3	76.7
Any in another household	3.2	2.2	1.1	1.1
No animals	52.4	52.7	67.6	22.2
<b>Husbands' responses</b>				
Only in own household	44.5	44.2	31.0	75.6
Any in another household	1.8	1.8	0.7	1.8
No animals	53.7	54.0	68.3	22.6

Source: Calculated by the authors.

Notes: The table shows the frequency of answers to the question: 'Does the household currently have any [livestock type] as part of the holding?' (i) Yes, in this household; (ii) Yes, in another household; (iii) Yes in both this household and in another household; (iv) No. Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds; Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons).  $N = 275$  couples.

some of their livestock with other households. There are various potential explanations. People may loan an animal to another household in order to provide them with milk or animal traction (Dumas et al., 2018). People may send animals to a household that is better able to care for them at a particular time or people may diversify the location of their animals as a risk strategy against drought, disease or theft. Keeping animals at another household may also be a way to hide them and protect claims over the livestock from other household members.

The survey asked where the livestock were kept. Table 4 shows the husbands' and wives' reports. We do find reports of animals being held by other households, although the numbers are small. Two to three

**Table 5.** Distribution of households by spousal responses regarding wife's ownership (%).

	Cattle	Goats and Sheep	Pigs	Poultry
Husband says joint, wife says she doesn't own	2.5	4.7	1.5	7.6
Wife says joint, husband says she doesn't own	9.5	5.5	3.6	14.2
Wife says she owns exclusively, husband says jointly	0.4	0.0	1.8	0.0
Wife says she owns, husband says no livestock kept	4.0	3.3	3.6	4.0
<b>Total with discrepancy</b>	<b>16</b>	<b>13</b>	<b>11</b>	<b>26</b>
Neither lists wife as an owner	67.6	63.3	76.0	31.3
Both say wife jointly owns with husband	5.5	6.2	4.7	20.4
Both say wife owns, other combinations of ownership	10.5	17.1	8.7	22.5
<b>Total without identified discrepancies</b>	<b>84</b>	<b>87</b>	<b>89</b>	<b>74</b>
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated by the authors.

Notes: The table is based on the responses to the questions: 'Do you currently own [livestock type] exclusively or jointly with someone on or off the holding?' and 'Who owns [livestock type] jointly with you?' Includes all households regardless of whether they have the livestock type of not ( $N = 275$  couples). Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds; Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons).

per cent of respondents reported that cattle or sheep and goats were held in another household. One to two per cent of respondents reported that pigs or poultry were held elsewhere. These numbers may be undercounting the animals held elsewhere; if people are hiding livestock from their spouse, they may not report those animals to the enumerators.

To explore these discrepancies further, we look at the distribution of matching and divergent responses from spouses regarding ownership and their rights. As noted above, when either the husband or wife responded they owned animals of a particular type of livestock, they were asked whether the animals are also owned by someone else, and if so, who the other owners are. Thus, we know whether or not they list their spouse as having ownership rights. For fructus rights, all respondents were asked who made these decisions regardless of ownership. Thus, we have information from both spouses on whether the wife has rights and we can compare this information. We can do this for each type of livestock, for each right, and also for husbands' rights.

**Table 6.** Distribution of households by spousal responses regarding husband's ownership (%).

	Cattle	Goats and Sheep	Pigs	Poultry
Wife says joint, husband says he doesn't own	5.1	3.3	2.9	6.6
Husband says joint, wife says he doesn't own	6.9	8.0	3.6	14.9
Husband says he owns exclusively, wife says jointly	0.7	0.0	1.8	0.0
Husband says he owns, wife says no livestock kept	2.6	1.8	2.2	3.6
<b>Total with discrepancy</b>	<b>15</b>	<b>13</b>	<b>11</b>	<b>25</b>
Neither says husband owns	61.8	66.6	77.8	33.5
Both say husband owns jointly with wife	5.5	6.2	4.7	20.4
Both say husband owns, other combinations of ownership	17.5	14.2	6.9	21.1
<b>Total without identified discrepancies</b>	<b>85</b>	<b>87</b>	<b>89</b>	<b>75</b>
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Calculated by the authors.

Notes: The table is based on the responses to the questions: 'Do you currently own [livestock type] exclusively or jointly with someone on or off the holding?' and 'Who owns [livestock type] jointly with you?' Includes all households regardless of whether they have the livestock type of not ( $N = 275$  couples). Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds; Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons).

Table 5 presents the information regarding the wife's ownership of livestock as reported by both spouses. We can identify two forms of discrepancy in responses. The first is when the wife says she owns livestock, but her husband's response is inconsistent with hers. She may claim to be an owner with her husband, but her husband does not include her as a joint owner. Or the wife may say she owns the livestock exclusively, but her husband says they own the livestock jointly. Finally, the wife may say that she owns livestock, but her husband says there are no livestock owned by the household. The second type of discrepancy is when the wife does not claim to be an owner, but her husband lists her as a joint owner. In the other combinations of responses, we cannot identify a discrepancy. Table 6 is constructed similarly based on the information on the husband's ownership of livestock.

We are able to identify a substantial amount of discrepancy, which is largely driven by one spouse claiming exclusive or joint ownership and the other not recognizing those claims. For wives, this is particularly true for cattle. Sixty-two per cent of the discrepancies

over the wives' ownership of cattle is the wife claiming she owns the livestock jointly with her husband and the husband not acknowledging it or the wife claiming the cattle are hers exclusively and the husband claiming joint ownership.

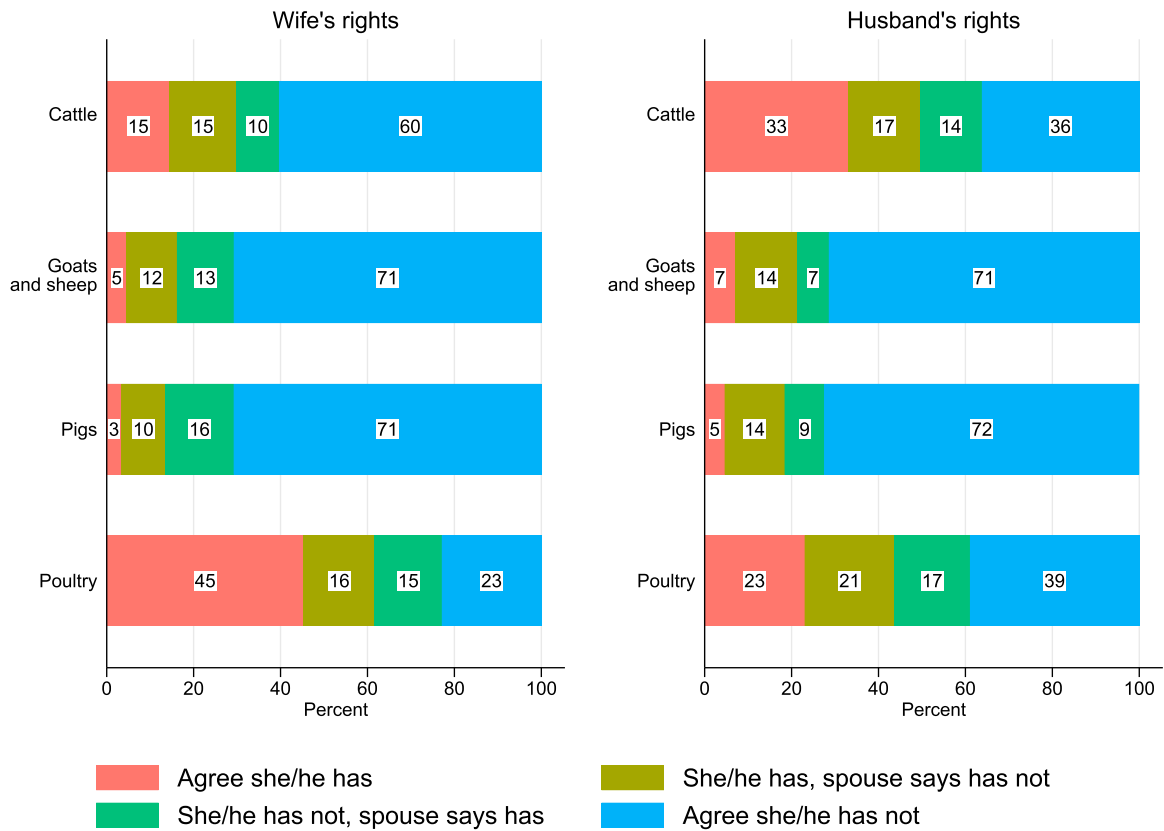
Figures 5 and 6 are based on the responses to questions about who made the decisions over home consumption (Figure 5) and market activities (Figure 6) since the past rainy season and all are conditional on the wife (with regards to her rights) and husband (with regard to his rights) reporting that the household owns the respective livestock type.<sup>5</sup> In some households, the decision was made to not consume any of the products at home or to sell livestock or their products in the market. These observations appear in the category where both the husband and wife respond that the other did not have the right. Any bias resulting from our approach would identify fewer discrepancies around the rights than is the case.

Wives' claims to rights regarding decisions about home consumption of products produced and for market activities are highly contested. Although 14% of the wives claim to have rights over market activities of cattle, their husbands rarely acknowledge their right. Wives also claim rights over decisions about home consumption of products produced from cattle in 30% of households that own cattle, but for half of these households, the husbands disagree.

Similarly, husbands frequently disagree with wives' claim to rights over decisions about home consumption and market activities of goats, sheep, and pigs. The least amount of discrepancy is with regards to wives' claim to rights of over decisions about home consumption of poultry and eggs. Wives' claim rights over decisions about home consumption of poultry and eggs in 61% of households that own poultry; husbands disagree in only one-quarter of these households.

Poultry are usually considered to be in women's domain and wives are more likely to manage the poultry and are equally likely to claim ownership as their husbands. The proportion of husbands and wives who claim rights over the market activities are similar and a large share of the claims to market activities are not acknowledged by the other.

Across all livestock, husbands' claims to rights over cattle are the least contested by wives (Figures 5 and 6). It is noteworthy that in some households, spouses assert the other has the rights over livestock, while they themselves do not claim these rights. This is less common for wives' rights over market activities



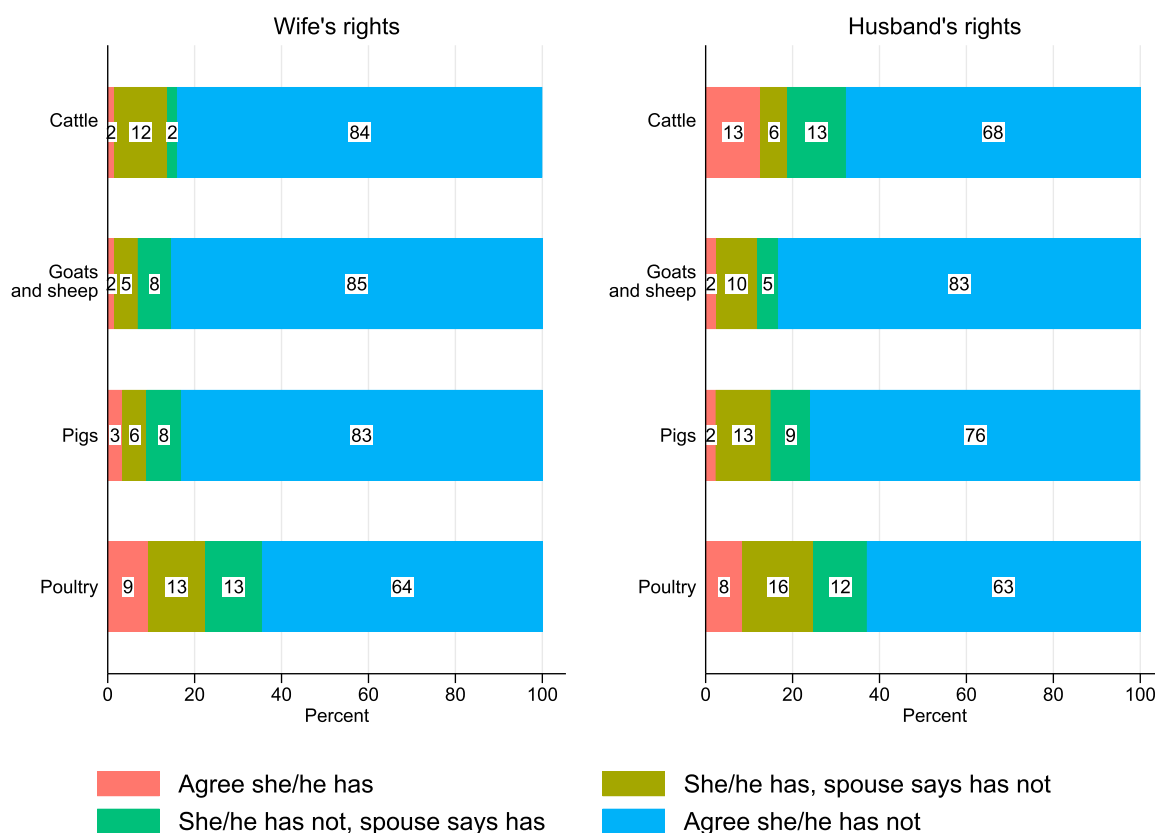
**Figure 5.** Distribution of couple's agreement on rights over output for home consumption, conditional on the household owning livestock, by livestock type. Source: Calculated by the authors. Notes: The figures show the distribution of households by agreement/disagreement on rights over output for home consumption from the wife and husband's perspective separately. Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds; Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons). These are conditional on the household owning livestock from the perspective of the wife and husband respectively. For wives, this is based on 131 (cattle), 130 (sheep and goats), 89 (pigs), and 214 (poultry) observations. For husbands, this is based on 127 (cattle), 126 (sheep and goats), 87 (pigs), and 213 (poultry) observations.

for cattle (2% of the households), but, for wives, it ranges from 8% of households that sold goats/sheep or pigs, to 13% of households that sold poultry or poultry byproducts. For husbands, it ranges from five to 13%. For husbands, it is particularly striking with cattle and poultry.

### Are discrepancies due to asymmetrical information?

We find discrepancies in the reports from husbands and wives, both about the numbers of livestock owned by the household and in terms of the rights that spouses ascribe to themselves and to each other. One explanation may be that neither spouse has full information.

Following Ambler et al. (2021), we explore whether the discrepancies in the reports from spouses, both about the numbers of livestock owned by the household and in terms of the rights that spouses ascribe to themselves and to each other, may be due to asymmetric information or hiding. First, we assess whether the discrepancy in the data between husbands and wives is due primarily to measurement error, which would suggest that the differences are random and not due to asymmetrical information. In this case, the discrepancies would be symmetrical. If husbands and wives make errors with equal likelihood and the probability of making the error that the wife has rights over the livestock is the same as making the error the wife does not have rights over the livestock, then the two types of discrepancies with regards to the wife's rights should occur with equal



**Figure 6.** Distribution of couple's agreement on rights over market activities, conditional on the household owning livestock by livestock type. Source: Calculated by the authors. Notes: The figures show the distribution of households by agreement/disagreement on rights over market activities from the wife and husband's perspective separately. Cattle includes domestic and improved breeds; Goats and sheep include domestic and improved breeds; Poultry includes domestic and improved chicken and other poultry (ducks, turkeys, guinea fowl, doves, pigeons). These are conditional on the household owning livestock from the perspective of the wife and husband respectively. For wives, this is based on 131 (cattle), 130 (sheep and goats), 89 (pigs), and 214 (poultry) observations. For husbands, this is based on 127 (cattle), 126 (sheep and goats), 87 (pigs), and 213 (poultry) observations.

probability. The same is the case with regards to the husband's rights. We test this in Table 7 and test the symmetry between responses regarding husbands' rights in Table 8. We disaggregate the responses by both the type of livestock and each specific decision made. If the wife or husband claims the household does not have livestock, this is coded as the individual not owning that type of livestock, so that the analysis is not conditional on the household holding livestock. Thus, it differs from the figures above which are conditional on the household owning the livestock type. We also disaggregate the two survey questions that make up the consumption rights and the two questions that make up the market rights. In addition, there are two additional questions in the survey related to market rights: the decision on how to use the earnings from selling

the products, and decision on how to use the earnings from selling the animal. These are conditional on the other two market decisions and, thus, did not change the aggregated rights incidence in the statistics above. We include them here for a more detailed look at the discrepancies in the responses by the spouses.

While there are discrepancies (differences in (a) and (b) in Tables 7 and 8), and occasionally large discrepancies, many of the patterns are symmetric, suggesting it may simply be measurement error. There are some notable exceptions, however. The responses about the wife's involvement in decisions to sell products (i.e. milk) from cattle are asymmetrical. Correspondingly, the responses to the wife's involvement in decision about what to do with earnings from milk are asymmetric. In nearly 6% of households, the

**Table 7.** Patterns of responses regarding whether wife has rights.

			Cattle	Goats and sheep	Pigs	Poultry
Rights over the output for household consumption (fructus rights)	Decisions regarding which by products to consume	(a) Wife yes/husband no	7.3%	5.5%	3.3%	15.6%
		(b) Wife no/husband yes	5.1%	5.5%	5.1%	18.2%
		<b>Absolute difference (a) – (b)</b>	<b>2.2%</b>	<b>0.0%</b>	<b>1.8%</b>	<b>2.5%</b>
	Decision to slaughter for home consumption	(a) Wife yes/husband no		0.4%		12.0%
		(b) Wife no/husband yes		1.5%		10.9%
Rights over market activities (fructus rights)	Decisions on which by products to sell or trade	(a) Wife yes/husband no	5.1%	0.4%	0.4%	5.1%
		(b) Wife no/husband yes	0.7%	1.1%	0.7%	3.3%
		<b>Absolute difference (a) – (b)</b>	<b>4.4%**</b>	<b>0.7%</b>	<b>0.4%</b>	<b>1.8%</b>
	Decision to sell animal	(c) Total discrepancy (a) + (b)	5.8%	1.5%	1.1%	8.4%
		<b>Difference in total discrepancy (c) between cattle other livestock</b>		<b>4.4%***</b>	<b>4.7%***</b>	<b>2.5%</b>
		(a) Wife yes/husband no	1.8%	2.2%	1.8%	8.0%
	Decisions on how to use the earnings from selling the products	(b) Wife no/husband yes	0.7%	3.3%	2.9%	8.4%
		<b>Absolute difference (a) – (b)</b>	<b>1.1%</b>	<b>1.1%</b>	<b>1.1%</b>	<b>0.4%</b>
		(c) Total discrepancy (a) + (b)	2.5%	5.5%	4.7%	16.4%
	Decision on how to use the earnings from selling the animal	<b>Difference in total discrepancy (c) between cattle other livestock</b>		<b>2.9%*</b>	<b>2.2%</b>	<b>13.8%**</b>
		(a) Wife yes/husband no	5.5%	0.4%	0.4%	5.8%
		(b) Wife no/husband yes	0.7%	0.4%	1.1%	3.3%
	Decisions on how to use the earnings from selling the products	<b>Absolute difference (a) – (b)</b>	<b>4.7%***</b>	<b>0.0%</b>	<b>0.7%</b>	<b>2.5%</b>
		(c) Total discrepancy (a) + (b)	6.2%	0.7%	1.5%	9.1%
		<b>Difference in total discrepancy (c) between cattle other livestock</b>		<b>5.5%**</b>	<b>4.7%**</b>	<b>2.9%</b>

Source: Calculated by the authors. Notes: The table shows the incidence of discrepancies on wife's fructus rights and the results of testing that the proportion of households where the wife reports that she has the right and the husband does not acknowledge it (a) equals the proportion of households where husband reports that the wife has the right and the wife does not (b). \* Significant at  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.001$ . Includes all households regardless of whether they have the livestock type of not ( $N = 275$ ).

wife reports being involved in these decisions and the husband reports that she was not. But in fewer than 1% of households the husband says the wife is involved and she reports that she is not.

One explanation might be that men and women have different interpretations of the question or understandings of what it means to make these

decisions. In this case, spouses would systematically provide different answers, but we would expect that the discrepancies would be similar across different forms of livestock. Instead, we find that discrepancies in responses differ depending on the type of livestock for the rights over market activities (Tables 7 and 8 differences in total discrepancy across livestock

**Table 8.** Patterns of responses regarding whether husband has rights.

			Cattle	Goats and sheep	Pigs	Poultry
Rights over the output for household consumption (fructus rights)	Decisions regarding which by products to consume	(a) Husband yes/Wife no	7.6%	6.2%	4.4%	14.2%
		(b) Husband no/Wife yes	7.3%	4.4%	3.3%	10.9%
	Decision to slaughter for home consumption	<b>Absolute difference (a) – (b)</b>	<b>0.4%</b>	<b>1.8%</b>	<b>1.1%</b>	<b>3.3%</b>
		(a) Husband yes/Wife no		1.5%		15.3%
Rights over market activities (fructus rights)	Decisions on which by products to sell or trade	(b) Husband no/Wife yes		0.7%		12.0%
		<b>Absolute difference (a) – (b)</b>		<b>0.7%</b>		<b>3.3%</b>
		(a) Husband yes/Wife no	2.9%	1.1%	1.8%	5.8%
		(b) Husband no/Wife yes	5.8%	0.0%	0.7%	3.6%
	Decision to sell animal	<b>Absolute difference (a) – (b)</b>	<b>2.9%</b>	<b>1.1%*</b>	<b>1.1%</b>	<b>2.2%</b>
		(c) Total discrepancy (a) + (b)	8.7%	1.1%	2.5%	9.5%
		<b>Difference in total discrepancy (c) between cattle other livestock</b>		<b>7.6%***</b>	<b>6.2%***</b>	<b>0.7%</b>
		(a) Husband yes/Wife no	1.8%	4.4%	3.3%	10.2%
	Decisions on how to use the earnings from selling the products	(b) Husband no/Wife yes	4.4%	2.5%	2.9%	9.5%
		<b>Absolute difference (a) – (b)</b>	<b>2.5%*</b>	<b>1.8%</b>	<b>0.4%</b>	<b>0.7%</b>
		(c) Total discrepancy (a) + (b)	6.2%	6.9%	6.2%	19.6%
		<b>Difference in total discrepancy (c) between cattle other livestock</b>		<b>0.7%</b>	<b>0.0%</b>	<b>13.5%***</b>
	Decision on how to use the earnings from selling the animal	(a) Husband yes/Wife no	2.5%	1.1%	1.8%	6.2%
		(b) Husband no/Wife yes	5.5%	0.0%	0.7%	3.3%
		<b>Absolute difference (a) – (b)</b>	<b>2.9%*</b>	<b>1.1%*</b>	<b>1.1%</b>	<b>2.9%</b>
		(c) Total discrepancy (a) + (b)	8.0%	1.1%	2.5%	9.5%
	Decision on how to use the earnings from selling the animal	<b>Difference in total discrepancy (c) between cattle other livestock</b>		<b>6.9%***</b>	<b>5.5%***</b>	<b>1.5%</b>
		(a) Husband yes/Wife no	1.8%	4.4%	3.3%	10.2%
		(b) Husband no/Wife yes	4.4%	2.5%	2.9%	9.8%
		<b>Absolute difference (a) – (b)</b>	<b>2.5%*</b>	<b>1.8%</b>	<b>0.4%</b>	<b>0.4%</b>
		(c) Total discrepancy (a) + (b)	6.2%	6.9%	6.2%	20.0%
		<b>Difference in total discrepancy (c) between cattle other livestock</b>		<b>0.7%</b>	<b>0.0%</b>	<b>13.8%***</b>

Source: Calculated by the authors. Notes: The table shows the incidence of discrepancies on husband's fructus rights and the results of testing that the proportion of households where the husband reports that he has the right and the wife does not acknowledge it (a) equals the proportion of households where wife reports that the husband has the right and the husband does not (b). \* Significant at  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.001$ . Includes all households regardless of whether they have the livestock type of not ( $N = 275$ ).

type). Given that this asymmetric measurement error is present, this suggests that the discrepancies with regard to women's involvement in the decisions to sell milk from cattle and use the earnings are not exclusively due to differences in husbands' and wives' interpretation of the survey questions. It may be husbands are unaware that wives are selling the milk.

Regarding decision-making by husbands, the evidence suggests the discrepancies in decision-making about cattle is not simply due to measurement error

or interpretation of the survey questions. This is true to a lesser extent for goats and sheep. What is curious about the husbands' decision-making with regards to cattle, however, is that a husband is more likely to report he did not make the decision when his wife reports he did, than to report he made the decision when the wife says he did not. Although men are more likely to manage the cattle, wives are attributing more decision-making over the cattle to their husbands than their husbands themselves claim.

## Discussion

Our findings demonstrate it is important to look beyond simply who within the household owns livestock to also analyse who holds the various rights. Different family members may hold ownership, management, and fructus rights.

Spouses gave similar reports on whether or not the household owned the different types of livestock. Husbands' and wives' self-reports about livestock ownership show that the incidence of livestock ownership is similar among women and men, and this holds true across all livestock types. Yet, with the exception of cattle, women are more likely to be the managers of the livestock, regardless of whether or not they self-report as owners. Ample other evidence in the literature suggests that livestock is commonly the responsibility of women in the household (Brugère et al., 2001; Curry, 1996), although much of this literature does not clearly distinguish between management and providing labour for the animal's care. Ownership rights do not automatically confer fructus rights, particularly for women. Although wives may self-report as owners of the different livestock types, they do not necessarily have the rights to decide what to consume at home or about marketing activities. This seems to be particularly the case in terms of cattle.

The gendered patterns of rights vary across livestock types. Cattle are traditionally perceived as being owned and managed by men, although women may provide labour for the upkeep of the cattle (Dumas et al., 2018; Guèye, 2000; Njuki & Sanginga, 2013; Simiyu & Foeken, 2013). Just under half of our sampled households own cattle. In our couple sample, men are equally like to own cattle as women (with the exception of improved cattle breeds), but more likely to manage cattle than women. Only half of the women who own cattle say they are involved in the management, so simply asking about ownership will not tell us about who manages the cattle. But given that nearly a quarter of the women in our sample manage cattle suggests that extension programmes need to recognize women's involvement and not simply focus on men. This goes beyond women simply providing labour; they are claiming they have these management rights.

Men also have more of the fructus rights for cattle, both to make decisions about home consumption and market activities. Yet, we do not see complete

overlap in rights. Even women who do not claim to own the cattle may say that they have fructus rights: 7.3% say that they are involved in decisions about home consumption and 3.1% say that they are involved in marketing decisions.

We identify discrepancies in the spouses' responses regarding who owns cattle in 16% of households with regards to the wives' ownership and 15% of the households with regards to the husbands' ownership. This is a lower bound because we cannot identify all dimensions of discrepancies with our data. In 25% of the households that own cattle, there are discrepancies in the spouses' reports on whether the wife has fructus rights regarding home consumption and in 31% of households there are discrepancies regarding the husband's rights. While discrepancies on the wife's rights regarding market activities are fewer, this is because of a greater agreement that the wife has no rights.

Roughly the same number of households own sheep and goats as cattle; fewer households own pigs. We do not observe gendered patterns in whether or not men and women report that they own sheep and goats. Thus, the stylized fact that men own cattle and women own smaller livestock is not observed in this sample of couples.

For all of these smaller livestock, more women than men report they are the managers. Of the women who report that they own pigs, 87% of them say that they also manage them; the comparable number for men is only 51%. Yet, men are more likely than women to report having the fructus rights. There are similar discrepancies in spousal reporting about who owns the smaller livestock and about who owns the cattle. But there are fewer discrepancies about who has the fructus rights over smaller livestock than cattle.

The patterns for poultry are somewhat different. More than 75% of households own poultry. While traditionally poultry are perceived as belonging to women, we find that roughly equal numbers of men and women claim that they own poultry. Almost all the women who are owners are also managers, but that is less true for men. Additionally, 33% of women who do not own poultry still claim to manage them (compared to only 5% of men who do not own them), highlighting, again, that ownership and management do not necessarily overlap.

More women than men claim fructus rights regarding home consumption, whether or not they own the poultry. Husbands and wives each claim rights over

the market activities for poultry, although for many their rights regarding market activities are not supported by their spouses. These insights into the intra-household distribution of ownership, management and fructus rights over poultry are in line with the literature. Across developing regions, women generally manage the poultry while ownership and fructus rights are less clearly identified (Alemayehu et al., 2018). While the discrepancies about ownership and rights are higher for poultry than for any of the other livestock, we do not find evidence that this is more than measurement error.

We have some instances where one spouse claims to own livestock and the other says that the household does not own any of that type of livestock. This, combined with reports of animals that are kept at other households, suggests that some respondents may be hiding animals from their spouse. These results are consistent with other literature that has explored discrepancies in ownership and decision-making, finding that discrepancies in ownership and decision-making between husbands and wives could be more than measurement error and differences in men's and women's interpretation of questions (Ambler et al., 2021, 2022).

While other studies have considered the reports of husbands and wives about ownership and decision-making, they have tended to focus on the reports on whether the wife is an owner and makes decisions (Ambler et al., 2021, 2022). We extend that approach to examine discrepancies on whether the husband owns or makes decisions and find similar patterns. While some of these patterns may be a result of the same contestation of rights, our findings suggest that the discrepancies are not simply about the wife's rights.

These findings have significant implications for the design and implementation of livestock development interventions (Johnson et al., 2015; Roy et al., 2015). There is increasing recognition that interventions in the livestock sector may affect women's ownership and rights over livestock as well as their work burdens. These interventions may include index-based livestock insurance (Bageant & Barrett, 2017) asset transfer programmes, (Johnson et al., 2015; Roy et al., 2015), dairy commercialization (Tavenner et al., 2018; Tavenner et al., 2019) and vaccination programmes (McKune et al., 2021). Baltenweck et al. (in press) carried out a scoping review on the impacts of livestock interventions, including cooperatives and group support, extension, training and access to input and output markets, on women's empowerment. They found that a range of interventions had some

positive impacts on women's access to and control over assets and income, but most tended to increase women's work burden significantly. By extending the evaluations to consider the full range of rights over livestock at the individual level, we may be better able to identify how the interventions change women's rights, both positively and negatively with this information, interventions can better integrate activities that have the potential to increase gender equality and women's empowerment, in addition to improving household income, food security and resilience.

## Conclusion

This study explores how rights over livestock are distributed between spouses using survey data from smallholder agro-pastoral households in Uganda. The Uganda survey follows the best practice of collecting data on asset ownership of men and women, and included detailed questions on who made the decisions over the livestock (FAO, 2018a). The survey was administered to both a husband and wife and their rights are ascribed based on their own responses. Important gendered patterns become visible when we ask a few more detailed questions about who in the household has the management and fructus rights.

Our data includes information on ownership using the respondents as the unit of analysis. We know whether each respondent owns any cattle, sheep or goats, pigs, or poultry, and the rights they claim regarding them. While we have the number of each type of animal owned by the household, we do not have the information on how many animals each respondent claims the rights over. Our approach works well when the interest is in the people and in understanding how the ownership of different livestock species is distributed between husbands and wives; owning livestock and claiming the rights is an important dimension of empowerment. However, to have a more comprehensive picture of the relative asset holdings of husbands and wives, it is critical that surveys collect information about the numbers of animals within the herd or flock owned by women and men. Even though, in our study, husband and wives are equally likely to own any livestock, significant gender inequalities with respect to the number of animals owned are possible.

We find some evidence of people hiding livestock from family members. Some respondents report that they own livestock while their spouse reports that

the household does not own any, and some people report keeping their livestock in another household. In addition, the discrepancy analysis suggests there may be asymmetric information regarding cattle. While this does not conclusively identify that people are deliberately hiding livestock, it is suggestive. It is challenging to identify hidden assets, since respondents who are hiding assets from their spouse are unlikely to report them to a researcher.

Our results demonstrate the importance of disaggregating the data on ownership and rights over livestock and that it matters who is asked the question within the household, however, it does not suggest we should focus our analyses only on the individual level. Ownership, management, and decisions about what to do with the outputs all happen *within the household*. The discrepancies about the numbers owned and who holds the rights suggest that the household context shapes the responses that are obtained. If people are behaving strategically, we need to begin to understand the ways in which they are doing so, by analysing the decisions of individuals within the context of their household.

Further analysis is needed on the patterns of exclusive and joint ownership for livestock. This would require more detailed information on each animal within the herd or flock to know whether the respondents understood the animals to be owned jointly and whether multiple people held the rights for different animals. Qualitative data can be particularly useful in getting at the nuanced, local interpretations of joint ownership and decisions-making (Acosta et al., 2020). With panel data on these rights over time, we could analyse the extent to which ownership patterns influence which animal is sold. For example, are women's or men's livestock assets sold first in time of economic shocks? These patterns could have longer-term implications for wealth and asset accumulation and for resilience building.

Often researchers and development practitioners assume the owner has the fructus rights; the livestock owner will obtain the benefits from the sale of livestock products. Our findings suggest that this is not necessarily the case. Ownership does not automatically confer management and fructus rights. It is more complex and nuanced than this, in that it is entwined with different rights depending on gender of the owner and the type of livestock. Thus, it is important that project baselines and impact evaluations include dimensions that are most appropriate in the data collection.

## Notes

1. While much of the literature refers to husbands and wives providing different responses as disagreements, we prefer to treat these as discrepancies in responses.
2. One of the authors was involved in the design and collection of the data. The data was collected as part of the Global Strategy to improve Agricultural and Rural Statistics (GSARS) in 2016. GSARS is housed in the Statistics Division at FAO. The data are available at Food and Agriculture Microdata (FAM) Catalogue: <https://microdata.fao.org/index.php/catalog/1918>.
3. The tropical livestock unit is weighted sum of all animals: cattle = 0.7, Goats = 0.1, Sheep = 0.1, pigs = 0.2 and chicken = 0.01 following (Otte & Chilonda, 2002).
4. Note that the questions ask about the decisions made since the last rainy season. Thus, in some cases, no decision has been made in this period.
5. If the wife says the household keeps goats and she has rights over these goats, for example, and the husband reports the household does not have any goats, we categorize this as the husband not acknowledging her rights. If the wife says the household keeps goats but she has no rights over them, and the husband reports the household does not have any goats, we categorize this as that both respond the wife does not have rights over goats.

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## Notes on contributors

**Marya Hillesland** is a Research Officer at the Oxford Department of International Development, University of Oxford, UK.

**Cheryl Doss** is a Professor of International Development at the Oxford Department of International Development, University of Oxford, UK.

**Vanya Slavchevska** is a Social Policy Officer (Poverty Reduction) with the Inclusive Rural Transformation and Gender Equality Division (ESP) of the Food and Agriculture Organization of the United Nations (FAO), Rome, Italy.

**Martina Querejeta** is an Assistant Researcher at the Economics Department, Faculty of Economics and Administration, Universidad de la República, Uruguay.

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