

Available Online at EScience Press Journals

International Journal of Agricultural Extension

ISSN: 2311-6110 (Online), 2311-8547 (Print)

<http://www.esciencepress.net/IJAE>

INTRA-HOUSEHOLD DECISION-MAKING AMONG SMALLHOLDER AGROFORESTRY FARMERS IN THE EASTERN HIGHLANDS OF UGANDA

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ARTICLE INFO

Article history

Received: April 14, 2020

Revised: July 25, 2020

Accepted: August 27, 2020

Keywords

Decision-making

Dual-headed households

Spouses

Agroforestry technology

Decision accord

ABSTRACT

This paper examines the intra-household decision-making patterns among spouses regarding agroforestry decisions in the eastern highlands of Uganda. The study uses both quantitative and qualitative data to examine spousal differences in the allocation of decision-making power over eight agroforestry decisions in dual-headed households. Quantitative data were collected through a cross-sectional survey in which both husbands and wives were interviewed separately and used to determine the decision-making power of spouses as well as the influence of individual and household characteristics on decision-making. Qualitative data from focus group discussions were collected to validate the quantitative findings. The study found that there were agreements and disagreements among spouses on how decision-making power is exercised over a range of agroforestry decisions. Wives allocated themselves more decision-making power than was assigned to them by their husbands. The higher allocation of decision-making power for wives tended to be in decisions linked to their roles and responsibilities in the household. The most critical factor influencing accord in decision-making was the number of years spent together by the couple while the number of children shared between the couple and farm-labour difference between husband and wife was the most significant for discord. Findings imply that most agroforestry interventions where wives participate without their spouses are bound to fail in dual-headed households because wives have limited decision-making power. It's desirable for programmes promoting agroforestry to integrate both husbands and wives in their interventions, for agroforestry to be more meaningful in meeting their divergent interests.

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INTRODUCTION

Agroforestry has been a topical issue as one of the cheap and sustainable approaches in sustaining agricultural productivity. Many research and development agencies opted for agroforestry

technologies and practices as they seek to achieve improved smallholder farmers' livelihoods. They target a household as a single agent on the assumption that individuals within the household share the same preferences or that the household head acts in the best

interest of the family (Meijer *et al.*, 2015; Rogan, 2013). This assertion is however contestable, with studies showing that individuals in the household have different preferences (Bomuhangi *et al.*, 2016; Lusiba *et al.*, 2017; Meijer *et al.*, 2015). As a result, agroforestry decisions made by one member may not consider all the different interests of the household members (Haider, Smale, & Theriault, 2018). Moreover, most smallholder farmers, especially in Sub-Saharan Africa, cannot afford to split their land parcels into individually managed plots to cater separately for the individual preferences of household members. The organization and management of their fields are often done collectively by all household members through a decision-making process.

Decision-making is one of the most critical functions within the household undertaken to ration resources. Central to many household decisions is the idea of decision-making power, which reflects one's ability to influence decisions (Duflo, 2012; Kabeer, 1999). In many parts of Africa, household heads (usually men) are regarded as principal decision-makers in the households (Kabeer, 1999). However, the growing failure of development interventions targeting household heads has led some people to question whether they act in the best interest of their families. Also, there is more recognition of the central role women play to improve livelihoods of their families suggesting that increasing women's intra-household decision-making power could enhance positive outcomes of technological interventions (Godek & Garcia, 2018; Duflo, 2012; Kabeer, 1999). Women's involvement in intra-household decision-making is linked to the concept of women's empowerment – the expansion in their ability to make strategic life choices, particularly in contexts where this was lacking (Alkire *et al.*, 2013). Consequently, women-responsive approaches have been mainstreamed in international policy and development agenda. For example, the United Nation's Sustainable Development Goals (SDGs) recognize that improving women's involvement in decision-making is a crucial element to enhance livelihood and boost economic development (UN, 2020). These views have been contextualized into country-specific national frameworks and sub-national development plans emphasizing joint decision-making processes between men and women. In most dual-headed households (households where both husband

and wife are staying together), decision-making power is shared between husband and wives who may also have different interests concerning household activities (Godek & Garcia, 2018; Anderson *et al.*, 2017; Chen & Woolley, 2001). Household decision outcomes vary depending on who wields more decision-making power in the household. In their study in the Ivory Coast, Duflo and Udry (2004) found-out that in years when the production of wives' crops was higher than that of their husbands, dual-headed households spent more money on women other than men private goods. Likewise, dual-headed households in South Africa were found to spend more money on food than alcohol whenever wives garnered larger shares of income than their husbands (Gummerson & Schneider, 2013). Smith and Chavas (2007) concluded that male-favoured decision-making in Burkinabe households restricted the positive effects of rising income on the physical well-being of women.

Many interventions aimed at increasing women's involvement in agroforestry have failed to result into anticipated outcomes (Kiptot, 2016; Meijer *et al.*, 2015) due to lack of a proper understanding of their ability to influence decisions regarding key agroforestry activities. Only a few studies have examined intra-household decisions concerning agroforestry in dual-headed households (Haider *et al.*, 2018; Meijer *et al.*, 2015; Enete & Amusa, 2010; David, 1998). Such studies, however, are based on data mainly collected from household heads - often biased towards men reports (Rogan, 2013). Besides, these few studies often considered a single aggregated agroforestry decision (e.g. decision to adopt or not to adopt). Such studies are likely to hide a lot of variabilities since decision-making power varies depending on the nature of decision at stake (Haider *et al.*, 2018; Anderson *et al.*, 2017; Bomuhangi *et al.*, 2016). Therefore, knowledge of the decision-making power of spouses in dual-headed households and how it varies across agroforestry decisions remains unclear. This lack of clarity makes it hard to tailor agroforestry technologies to specific individuals within households. Given the composite nature of agroforestry, the new tasks it introduces and its multiple outcomes, splitting it into sub-activities might improve our understanding of the relative decision-making power between spouses for specific tasks. This study investigated how the relative decision-making power between spouses in a

household explains the agroforestry decisions on a farm. Specifically, this paper: (1) explores how the decision-making power varies between spouses in a dual headed household across a range of agroforestry decisions, and (2) determines the influence of wife and household characteristics on the accord in decision-making.

THEORETICAL FRAMEWORK

The unitary household model that treats the interests of individual household members as homogenous (Quisumbing & Maluccio, 2003; Bobonis, 2009) has been used in many studies to examine intra-household decisions. Under this framework, the attention is on the household heads who are assumed to be selfless for the well-being of other household members. However, this model does not consider the processes of household decision-making and underscores the individual factors that influence outcomes across a range of decisions (Richards *et al.*, 2013; Duflo & Udry, 2004). This study draws from the cooperative bargaining model (Marchant, 1997; Stahl Ingolf, 1972) to examine the intra-household agroforestry decisions among dual-headed households in the eastern highlands of Uganda. The model posits that decision-making in dual-headed households is negotiated directly between spouses. The decisions outcomes reflect each spouse's ability to influence the decisions within the dual headed household. At the heart of this model is the decision-making process through which spouses on their own try to reach an agreement on a particular course of action (Gummerson & Schneider, 2013; Stahl Ingolf,

1972). Decision-making power is perceived differently by both husband and wife and has to be negotiated across multiple household decisions (Anderson *et al.*, 2017).

In the context of this study, the agroforestry decisions reached at the household level are informed by the relative decision-making power of the husband and wife within the household. As shown in Figure 1, decision-making power is conditioned by the individual characteristics (Haider *et al.*, 2018) as well as household shared characteristics (Anderson *et al.*, 2017; Bertocchi *et al.*, 2014). Given that this study was carried-out in a patriarchal community, special focus was given to the decision-making power of wives because it is much linked to the expansion in their ability to make agroforestry decisions which are presumably dominated by their husbands. Wife-specific attributes such as age, education, and farm labour hours are critical determinants of their decision-making power (Bertocchi *et al.*, 2014; Bradshaw, 2013; Doss, 2013; Ashraf, 2009). From the household perspective, the number of children shared by the couple, size of land owned, livestock units as well as the number of years spent together will influence decision-making (Gummerson & Schneider, 2013; Sow, 2010). This study assumed that during the decision-making process, spouses do not evoke non-cooperative threat points such as violence and divorce (Seebens, 2011). Both husband and wife were treated as interdependent—exercising their decision-making power while leaning more to the family interests rather than their respective utility frontiers.

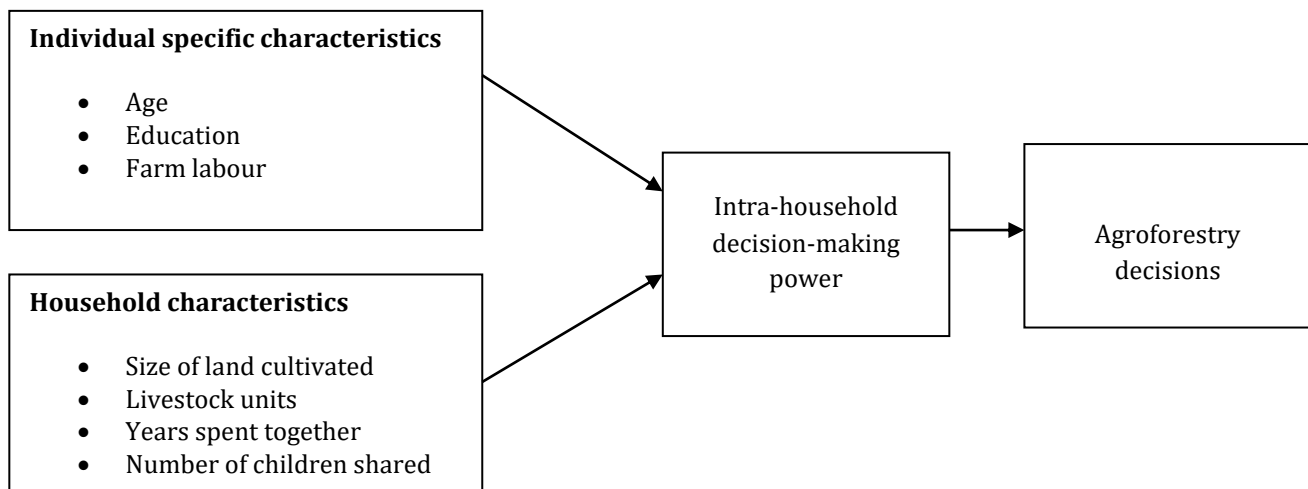


Figure 1. Conceptual framework for understanding intra-household decision-making (Source: own elaboration).

METHODOLOGY

Description of the study area

The research was carried-out in Manafwa (00° 55'N 34° 17'E) and Namisindwa (00° 49'N 34° 23'E) in the eastern highlands of Uganda. The districts were selected purposively based on their extended interface with agroforestry interventions. Both districts are described as medium to high altitude and are characterized by steep terrain, a bimodal rainfall pattern and a population density of over 200 persons per square kilometre which is about double the national average (UBOS, 2013). This high population density tremendously reduces the average land acreage per household and increases pressure on the existing natural resources.

Most of the people in the two districts belong to the Gisu tribe who subscribe to patrilineal descent. Among the Gisu, male children are initiated into manhood after circumcision, which occurs as early as 15 years at which point, they leave their parental house and begin to live independently. Also, at this point, the parents allocate land to their fully-grown son so that if he marries, he can fend for his family. Because of this, land among the Gisu is gradually sub-divided as more sons transform into adulthood in the family. The girls are married off as soon as they finish or drop-out of school. Agriculture is the primary source of livelihood with coffee, beans, maize, bananas, vegetables (onions, cabbage, tomato) and fruits being the leading enterprises (Oduol *et al.*, 2016). Declining land productivity has become more pronounced, especially among smallholder farmers due to soil erosion, deforestation and intensive cultivation of steep slopes. Climate change impacts such as landslides, floods, drought, pests and diseases are also rampant in the districts further leading to reduced land productivity (Bomuhangi *et al.*, 2016; Jiang *et al.*, 2014; Mbogga, 2013; Mubangizi *et al.*, 2017). Within the existing intensively managed banana-coffee agroforestry system, research and development agencies have been promoting innovative agroforestry technologies to enhance farm productivity. However, such interventions also paid limited attention to intra-household decision-making which may lead to success or failure to realize the anticipated outcomes (Doss, 2013).

Research design

A cross-sectional survey was conducted in April 2019

to collect data from both husbands and wives regarding their decision-making power on critical agroforestry decisions. The survey data was complemented by Focus Group Discussions (FGDs) to obtain an in-depth understanding on; agroforestry decisions made in the household, and why participants felt a particular decision fell predominantly to either husband or wife.

Sampling and sample selection

We purposively selected Manafwa and Namisindwa districts for the study based on their extended interface with research and development agencies that helped in the promotion of agroforestry technologies through on-farm trials and demonstrations. Previous studies in the two districts showed that there are no significant differences in socio-demographic characteristics between the two districts (Oduol *et al.*, 2016). Through consultations with key informants (district production coordinators) in the two districts, we purposively selected two sub-counties (Butta in Manafwa and Namabya in Namisindwa) that were considered to have the highest concentration of agroforestry activities. For the survey, the population of the study was defined as all dual-headed households implementing agroforestry in the targeted sub-counties. We referred to a dual-headed household as one where both a man and a woman were staying together in a socially sanctioned engagement that is based on a sexual relationship. The dual-headed households implementing agroforestry were identified by the names of household heads. Subcounty agricultural officers and a few extension staff for development agencies operating in the targeted sub-counties helped in generating a list of dual-headed households. A total of 492 dual-headed households implementing agroforestry constituted a sampling frame from which a sample of 215 dual-headed households was randomly obtained following Krejcie and Morgan (1970) Both husband and wife were interviewed in each household consequently resulting in 430 respondents.

A total of 4 focus group discussions was conducted; one for husbands alone, one for wives alone and two were mixed – husbands and wives. There were 36 participants (18 males and 18 females) involved in all the focus group discussions. Focus group participants were selected purposively selected from the survey participants based on spousal category (husband or wife) while paying attention to those whose age was

close to the average obtained in the survey and who had stayed with their spouses for at least five years.

Data collection

The first phase of data collection involved a survey where we used a semi-structured questionnaire to elicit data from the respondents (husbands and wives). Before each interview, we explained the purpose of the study and sought consent from the husband to interview his spouse. Husband and wife were interviewed separately for each household to reduce response bias that could arise from cultural norms and expectations (Anderson *et al.*, 2017). During the interviews, the male and female enumerators interviewed the husband and wife, respectively. The survey questionnaire was used to collect data on personal and farm characteristics, roles and responsibilities of each spouse in agroforestry as well as the allocation of intra-household decision-making power regarding key agroforestry activities by both husband and wife. Wife and husband specific characteristics were measured by age, years of education and the number of labour hours spent working on the farm daily. Household and farm characteristics were measured by land size owned by the household, livestock units, the number of children shared by the spouses, as well as the number of years the couple had spent living together. Following

Anderson *et al.* (2017), we adapted a scale of 0 to 10, which was used by each spouse to score their decision-making power in a given agroforestry decision (Table 1). If for example, a husband scored himself 6, he would be indirectly giving 4 to his wife. Decision-making power between husband and wife was scored on eight agroforestry decisions which had been generated during the pre-study:

- Who attends agroforestry training?
- Which tree species to plant on the farm
- Where to plant trees on the farm
- Which crop enterprises to incorporate in the agroforestry plot
- How to manage trees in the agroforestry plot
- Which tree products to harvest from the agroforestry plot
- Which tree products to sell
- How to spend money obtained from the sale of tree products

The quantitative data from the survey was supplemented with qualitative data collected through focus group discussions. The information processed from the survey was used to develop specific follow-up questions during focus group discussions. The focus group discussions were conducted in the local language (Lumasaba) – with participants discussing and agreeing by consensus. Responses were translated into English by a native Lumasaba speaker.

Table 1. Description of the scores used to analyze decision-making power.

Score	Description
10:0	The spouse holds all the decision-making authority. He/she does not have to inform their counterpart before or after the decision
9:1	The spouse informs their counterpart about the decision after it has been taken
8:2	The spouse informs their counterpart about the decision before its execution
7:3	The spouse informs the other before the execution of the decision, with the view of hearing their ideas. But their suggestions are rarely considered
6:4	Spousal ideas are considered, but the spouse has the final say in case of discord
5:5	Spouses participate equally in the decision-making process and agree on a course of action

Analysis

The quantitative data were analyzed using STATA version 13.0 to generate descriptive and inferential statistics. Descriptive statistics including means, standard deviations, minimum and maximum were obtained for all explanatory variables. For each decision, average scores for both husband and wife

were obtained as a measure of decision-making power. A t-test of the mean was used to determine whether mean accord scores for each decision was significantly different from zero. Following Anderson *et al.* (2017), intra-household decision-making was examined as a difference between the wife's decision-making authority over key agroforestry activities as reported

by the husband ($W_i[H_i]$) and the wife's self-reported authority ($W_i[W_i]$), i.e. $W_i[H_i] - W_i[W_i]$. This decision-level accord variable was then transformed into a dichotomous variable. For a given decision, households were classified as either in accord (i.e. 1 = accord) when the difference in spousal allocation of decision-making power ($W_i[H_i] - W_i[W_i]$) fell between -2 and +2, or otherwise (i.e. 0 = otherwise) with the difference in spousal allocation of decision-making power of +2 scores or greater, or -2 scores or less. Since both spouses shared the total score of 10, it did not matter whether husbands' or wives' allocation was used. We looked at the share of authority given to wives rather than husbands because a husband is the default head of the household in the study area and cedes power to his wife. Binary logistic regression was used to predict the probability of accord for each agroforestry decision.

The logistic model is specified as:

$$P(\text{Accord}_{ij}) = \beta_0 + \beta_1 W_{ij} + \beta_2 H_{ij}$$

Where $P(\text{Accord}_{ij})$ is the probability of accord in household i on decision j ; β_0 is the Y-intercept; W_{ij} is a vector of wife-specific characteristics in household i on decision j , H_{ij} is a vector of household characteristics (shared by wife and her husband). β_1 is a change in probability for a unit change in a given wife-specific characteristic. β_2 is a change in probability for a unit change in a given household-specific characteristic. Table 2 shows how we operationalized the explanatory variables included in the model and their hypothesized influence on decision-making.

Qualitative data from focus group discussions were analyzed using content analysis to synthesize the emergent issues. The detailed explanations gained from FGDs (including anecdotal evidence) were used to elaborate on the quantitative findings in the survey.

Table 2. Description of explanatory variables used in the models.

Variable	Variable description	Variable measurement	A priori sign	
			Accord	Discord
Wife specific characteristics				
Age	Age of the wife	continuous	+	+
Education	Number of years spent by the wife in school	continuous	+	+
Labour hours	Number of hours the wife spends on the farm daily	continuous	+	+
House characteristics				
Total land owned	Total land owned by the household in acres	Continuous	+	+
Livestock units	Total livestock units in the household	continuous	+	+
Number of children	Number of children shared between spouses	Continuous	±	±
Years spent together	Number of years spouses have been living together	Continuous	+	+

RESULTS AND DISCUSSIONS

Description of the respondents

Table 3 shows that the age of the respondents ranged between 19 and 79 years with husbands on average being older than their wives. The average number of years spent in school was 8 years for husbands and 6 years for the wives. Generally, wives spent slightly more time working on the farm as compared to their husbands. The average household land size owned by the household was 3.6 acres. This land size is larger

than the 2 acres reported in the region by Kimaiyo *et al.* (2017) and the national average of 2.7 acres reported by the Uganda Bureau of Statistics (2010) possibly because this study targeted agroforestry farmers who could have had slightly more land than the average farmer. The average livestock units were 1.1 with chicken and cattle being the leading livestock enterprises, although goats and pigs were also common. On average, couples had 6 children and spent 19 years together.

Table 3. Socio-demographic characteristics of the sample.

Variable	Mean	Std. dev	Minimum	Maximum
Individual-specific characteristics				
Husband's age in years	48.4	12.0	23.0	79.0
Wife's age in years	41.9	11.9	19.0	75.0
Husband's education in years	7.7	4.0	0.0	19.0
Wife's education in years	6.2	3.1	0.0	17.0
Hours spent on the farm by the husband	4.8	1.8	0.0	11.0
Hours spent on the farm by the wife	5.1	2.1	0.0	10.0
Household shared assets				
Household land owned – in acres	3.6	2.7	0.3	10.0
Household livestock units	1.1	0.9	0.0	5.1
Number of children shared by the couple	5.5	2.3	1.0	12.0
Number of years spent together	18.8	10.4	5.0	59.0

Roles and responsibilities of spouses in agroforestry

Both husbands and wives were involved in all the agroforestry activities but to a varying extent (Table 4). Husbands were responsible for attending most of the agroforestry training sessions, preparing the land, planting of the tree seedlings and marketing of the agroforestry products. Women, on the other hand, were responsible for weeding and protecting trees against grazing animals. Although harvesting of tree products is mainly done jointly, participants in the focus group discussions explained that women are mostly involved in the harvesting of products that are primarily used at home such as firewood, medicine and fruits. At the same

time, men are responsible for the harvesting of highly marketable products like timber. Women mainly harvest the twigs, branches, leaves while men dominate the harvesting of trunks that are converted into commercial products such as poles and timber. These roles and responsibilities in agroforestry are linked to the traditional division of labour and social obligations among the Gisu people. It is a responsibility of the wife, for instance, to weed agricultural fields and protect them against grazing animals. The wife is also responsible for food preparation in the household, which is linked to the collection of firewood.

Table 4. Roles and responsibilities of spouses during the implementation of agroforestry activities.

Activity	Husband (%)	Wife (%)	Joint (%)
Attending agroforestry trainings	70.0	21.4	8.6
Preparing of land	76.0	19.8	4.2
Planting of tree seedlings	64.4	12.1	23.5
Weeding	13.0	53.3	33.7
Protecting trees against grazing animals	23.7	55.1	21.2
Harvesting of tree products	32.1	18.8	49.1
Marketing of tree products	55.4	5.1	39.5

NB: the percentage scores are from both husbands and wives' responses (n=430)

Allocation of decision-making power between spouses

Figure 1 highlights the average score of decision-making power attributed to wives as reported by their husbands and themselves over nine decisions. For all the decisions, women allocated themselves more decision-making

power than was assigned to them by their husbands. One decision where wives had almost the same score of decision-making power as their husbands were on what crop enterprises to incorporate on the agroforestry plot. The other decisions fell predominantly in the domain of the husbands with less than 4 out of the total score of 10

on average being attributed to wives.

Decision-making power of wives was highest for decisions concerning which enterprises to incorporate in the agroforestry plot because it's associated with their household role of providing food to the household members. Literature shows that women tend to dominate decisions in activities that are linked to their household role of food preparation (Bomuhangi *et al.*, 2016; Meijer *et al.*, 2015; Enete & Amusa, 2010). Wives' decision-making power was lowest for agroforestry decisions related to the type of tree products to sale to the market which highlights men's continued dominance in activities likely to influence household income (Lusiba *et al.*, 2017). Further, decisions on which tree products to sale is linked to access to market information which is a privilege of men given their mobility. Men often go to trading centres for their social errands where they are more likely to access market information while their wives contend with multiple household roles such as childcare and cooking. Therefore, because men are more aware of the market information, they are better positioned to dominate decisions concerning the sale of

tree products.

The FGDs revealed that men often took decisions regarding tree management because men mainly did some of the tree management tasks such as pollarding (removing the top of a tree) and pruning. Such tasks are not regarded by society as usual for women to do in the study area. For example, pollarding and pruning many times involve climbing the tree which is culturally considered to be an indecent practice by girls and women as it exposes their legs above the knees which is culturally unacceptable among the Gisu. This claim is a clear example of where decision-making power in the household is linked to cultural norms (Lusiba *et al.*, 2017; Bomuhangi *et al.*, 2016). This linkage between decision-making power and roles and responsibilities was further emphasized by a participant in one of the FGDs:

"It's men who carry out most of the tougher tasks of tree management that involves climbing the tree. Since it's their work, they decide on when and how to do it".

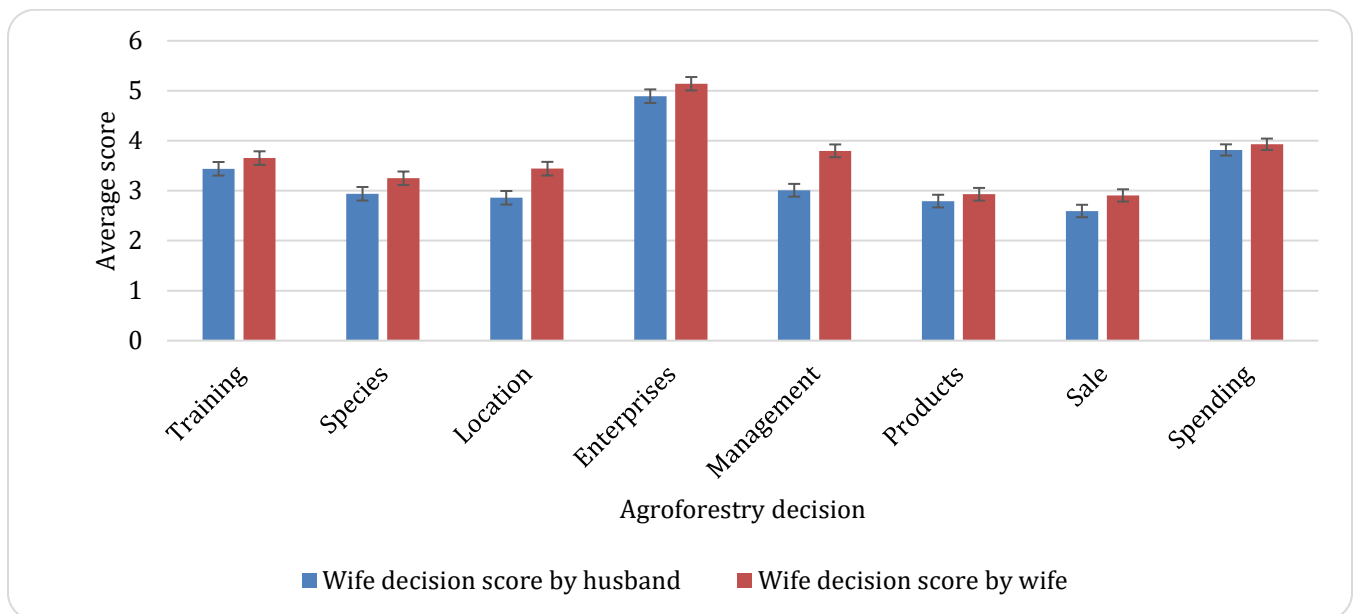


Figure 1. Average score of decision-making power attributed to wives as reported by the husbands and wives themselves.

Considering all the decisions, the differences in the score of decision-making power range up to 5 or more on all decisions and mean accord scores are significantly different from zero for 4 out of the 8 decisions (Table 5) representing potential disagreements in these decisions. For all the decisions, the mean difference between

husbands' reports of their wives and wives' self-reports was less than zero, implying that wives claimed more decision-making power than was acknowledged by their husbands. While there could be a tendency for wives to over-report their household decision-making power (Acosta *et al.*, 2019; Anderson *et al.*, 2017; Colfer *et al.*,

2015), the difference could alternatively be attributed to husbands' under-reporting of the decision-making power of their wives as explained by one of the participants during focus group discussions:

"As a woman, I can't argue so much with my husband. I will listen to what he says. Sometimes I do what he wants, and other times I do what I think is right. After all, I spend more time on the farm. If you argue, he will try to prove to you that he is the head of the household".

The mean of differences in husbands' and wives' reports regarding decisions on who attends training, which enterprises to incorporate in the agroforestry plot, which products to harvest and use of income were not

statistically different from zero implying accord between spouses in the decision-making process. The household decision-level accord variable ranges from -10 to +10. A minimum of -10 means that both spouses in a household thought that they held the decision-making power - reflecting a potential conflict between them over a decision. A maximum of +10 implies that a husband believed that a decision was entirely in the wife's domain, and the wife thought that it was entirely in the husband's domain - reflecting neglect of a decision. Incidences of a spouse assuming overall decision-making power and indecision between spouses in decision making have also been reported by Anderson *et al.* (2017) and Becker *et al.* (2006).

Table 5. Intra-household accord (Wi[Hi] – Wi[Wi]) means and variability across decisions.

Decision variable	Mean accord Wi[Hi] – Wi[Wi]	Std. Dev.	Minimum	Maximum	t-test of mean = 0
Training	-0.24	1.935	-10	6	-1.75
Tree species	-0.32	2.218	-10	10	-2.07**
Location	-0.59	2.428	-10	10	-3.43***
Crop enterprises	-0.32	2.704	-10	10	-1.70
Management	-0.79	2.467	-10	5	-4.55***
Harvesting	-0.22	2.171	-9	8	-1.46
Selling	-0.34	2.523	-10	8	-1.90*
Use of income	-0.19	2.092	-9	5	-1.32

*, ** and *** indicate statistical significance level at 10%, 5% and 1% respectively.

The influence of wife and household characteristics on intra-household decision-making

Wife and household characteristics were both important in influencing accord during decision-making, but their effect varied depending on the nature of the decision (Table 6). Starting with wife specific characteristics, for every 1-year increase in age of the wife, the probability of accord regarding where to plant trees on the farm increases by 0.8 percentage points and decreases by 0.6 percentage points concerning how to manage trees on the agroforestry plot. This means that relatively older wives are more likely to agree with their husbands on where to plant trees on the farm but disagree with them on how to manage trees planted. Other studies have also shown that women's age is correlated with more decision-making power as well as confidence in airing-out their views even when they are contrary to those of their husbands (Peterman *et al.*, 2015; Sraboni *et al.*, 2014; Becker *et al.*, 2006).

The probability of accord regarding use of income increases by 2.3 percentage points for every unit increase in the number of years spent in schools by the wife. This shows that educated wives are more likely to influence decisions on how to use the income from the sale of tree products. This reflects the possibility that increasing women's education may allow them to participate at least jointly with their spouses in decisions related to the use of income from the sale of tree products. This is because more education for women results in improved self-confidence when articulating household issues which may ultimately result in agreement or disagreement in the decision-making process with their spouses. This is in agreement with studies that have shown education to be a key component of women's decision-making power within the household (Colfer *et al.*, 2015; Peterman *et al.*, 2015; Becker *et al.*, 2006).

A unit increase in the number of hours spent by the wife on

the farm decreases the probability of accord about who attends agroforestry training and what tree species to plant on the farm by 6.7 and 4.1 percentage points respectively. Conventionally, it's the husbands who are entitled to attend training sessions because they are the household heads. And as owners of the land, they tend to decide on which tree species to be planted. However, if the wife spends more hours on the farm, she assumes more responsibility for the general outlook of the farm. This evokes her motivation to be more involved in decisions on who attends agroforestry training sessions and which tree species to plant on the farm, as explained by one of the participants during the focus group discussion:

"Some of our husbands work for a few hours, and others even don't work daily. They spend most of their time in the trading centres where they learn about trainings but rarely tell us. Even when they tell us, they still feel entitled to attend as household heads. But if I work for long hours on the farm, I know a lot about the farm than my husband. It's only fair that I'm the one who attends the agroforestry training sessions."

Some household shared assets and attributes were more strongly and consistently associated with the probability of accord. A unit increase in the livestock units of the household decreases the probability of agreement regarding how to manage the trees and how to use the income from the sale of tree products by 8.4 and 6.6 percentage points respectively. Within the study area, livestock is considered a key indicator of wealth and improved livelihood. This suggests that households with more animals were more likely to disagree on how to manage trees on the farm and use of income from the sale of tree products. This was substantiated by one of the husbands in the focus group discussions:

"...for example, we planted some Ficus spp. in our coffee farm to provide shade for the coffee. It later produced a dense shade, and we needed to cut off some of the branches. But when I talked about it with my wife, she refused because the trees provide shade for her pigs".

It later emerged from the FGDs that women own some of the livestock, especially goats and pigs in the household while others like cows and donkeys mainly belong to men. Usually, trees also provide materials for erecting the shelter for the animals and therefore, a reason why some trees in the garden may not be managed until such a time when the household needs construction raw

materials. This can result in conflicts depending on who is benefiting from the animals and underlying crop enterprises. The number of children shared by the couple decreased their probability of agreement in decisions related to where to plant trees on the farm, tree products to harvest, products to sale and overall management of the agroforestry plot by 4.1, 5.8, 5.0 and 5.4 percentage points respectively. In most parts of Uganda, children are traditionally seen as the most obvious way of cementing the relationship between spouses. While this may be true in the sense that spouses find it hard to separate when they have children, studies have also shown post-birth deterioration in the relationship functioning between spouses which could potentially result into disagreements on critical decisions in the household (Ivanova & Balbo, 2019; Gabb *et al.*, 2013; Doss *et al.*, 2009). In this context, children seem to be a source of disagreement in the decision-making of spouses. According to Gummerson and Schneider (2013), the presence of children is likely to moderate women's decision-making power as they always want to act in the best interest of their children. This was affirmed during the FGDs as one of the participants argued:

"As a wife, my role is to fight in the interest of my children. For example, I can't just allow my husband to sell the fruits when we have children at home. The same goes for firewood. If I don't have firewood to cook food for the children and there are trees in the garden, I will cut some. In the end, men usually get what they want, but we can disagree".

This affirmation signifies that even in cases where women try to hold on to their positions in the decision-making process, the ultimate decision was more like to be taken by the husband in the event of a disagreement. This points to the fact that women are seldom allowed to implement ideas that are not favoured by their husbands (Jahan & Sarker, 2015, p. 48).

Inversely, years spent by the couple together increases the probability of agreement on decisions related to what tree species to plant, where to plant on the farm and products to harvest from the planted trees by 0.8, 1.1 and 1.3 percentage points respectively. This means that as spouses live together for many years, they tend to have mutual respect. They become more accommodative of each other's views which contributes to the agreement in decision-making (Anderson *et al.*, 2017).

Table 6. The influence of wife, household and relative spousal attributes on intra-household accord $\{(Wi[Hi] - Wi[Wi]) < 2\}$ regarding agroforestry decisions.

Models	1	2	3	4	5	6	7	8
	Attends training	Tree species	Location	Crop enterprises	Managemen t	Products to harvest	Products to sale	Use of income
Wife's age (years)	-0.005	-0.004	0.008**	0.000	-0.006*	-0.002	0.001	0.002
Wife's education (years)	-0.001	0.008	0.008	-0.011	-0.011	-0.019	-0.004	0.023*
Wife's farm labour (hours)	-0.067***	-0.041*	-0.033	-0.027	-0.025	0.001	-0.022	-0.025
Household land cultivated (acres)	0.007	-0.011	-0.003	0.000	0.017	0.004	-0.011	-0.003**
Livestock units	-0.041	0.008	0.000	0.016	-0.084*	-0.040	-0.021	-0.066**
Number of children shared	0.018	-0.029	-0.041*	-0.024	-0.032	-0.058***	-0.050**	-0.049
Years spent together	0.002	0.008*	0.011**	0.007	0.004	0.013**	0.007	0.011

*, ** and *** indicate statistical significance level at 10%, 5% and 1% respectively.

CONCLUSIONS AND RECOMMENDATIONS

their ideas (Jahan & Sarker, 2015) and may reduce challenging tasks poses profound implications for This study has shown that there are agreements and their commitment to technology implementation on some of the agroforestry technologies like mixed disagreements on how decision-making power is the farm. The anticipated outcomes of agroforestry tree-cropping where the trees must be heavily shared across all agroforestry decisions. They may not be attained when wives who spend more managed to co-exist with crops. Such technologies agreement does not necessarily mean equal hours on the farm than their husbands reduce they may not appeal to female-headed households since decision-making power, but both spouses being commitment to agroforestry. This also means that they would have to hire men to provide extra comfortable with the way decision-making is wives remain at the periphery when it comes to labour for tree management tasks. In the event of exercised in the household. Decision-making in most accruing benefits from agroforestry since most of labour challenges, such labour-intensive tasks of the agroforestry decisions fell predominantly in their interests are kept at bay. The results of this might not be done on time which may result in the domain of husbands apart from the decisions on study also mean that most agroforestry adverse effects of trees on crops. which crop enterprises to integrate into interventions targeting wives in dual-headed The study found that although wives' decision-agroforestry plot. The allocation of decision-making households are bound to fail since wives have less making power in the overall harvesting of tree power to husbands tends to be linked to their more influence on decision-making. This means that products was lower than that of their husbands, it prominent roles and responsibilities in undertaking targeting agroforestry interventions within dual-was high for products that are linked to their agroforestry activities in the household. This implies headed households matters. Agroforestry household roles such as firewood and herbal that agroforestry decisions are not taken in isolation interventions should target both spouses for the medicine. This informs that priority setting should but are more linked to household roles and intended benefits to be realized since women, focus on promoting tree species that are responsibilities. Husbands' dominance in most of despite their less influence on decision-making, can multipurpose with a bias to products like firewood, the agroforestry decisions has implications on still frustrate decision implementation. fruits and medicine that are linked to wives' role of uptake of agroforestry decisions. The inability of The fact that men dominate tree management feeding the family and ensuring the health of wives to influence agroforestry decisions inhibits decisions because they do most of the more children in the household.

We find that a wife's influence in decision-making increases as her characteristics in terms of age, education and farm-labour hours get closer or even higher than those of her husband. Thus, affirmative action programmes that can enhance female literacy should be promoted alongside agroforestry interventions. Such affirmative action programmes could include adult literacy programmes for women tailored to suit their needs, as well as policies to reduce barriers to a girl child's primary and secondary school education.

The study also shows that accord between spouses in decision-making is also significantly influenced by household characteristics, especially the number of children shared by the couple as well as years spent together. The positive influence of the number of years spent together on decision-making warrants agroforestry promoters to ensure more precise targeting of technologies if the anticipated results are to be realized. In other words, for households where spouses have spent more years together, it doesn't matter who of them is engaged given that decisions are ultimately agreed upon by the couple.

In this study, we did not consider the influence of external factors on intra-household decision-making. Take, for instance, households that have remittances. Depending on who receives remittances in the household, they could have better financial power which in turn could increase their decision-making power. Likewise, suppose one of the spouses is connected to socially powerful individuals in society such as politicians. Thus, research is needed to determine the influence of external factors on the bargaining power between spouses.

ACKNOWLEDGEMENTS

Funds from the German Academic Exchange Service (DAAD) through the World Agroforestry Centre (ICRAF), as well as the National Agricultural Research Organization (NARO), supported this study.

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