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RESEARCH

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The gendered nature of household decision making and expenditure choices in the context of smallholder agricultural commercialization in Malawi

Loveness Msofi Mgalamadzi[1,2*], Mirriam Matita[1,3] and Masautso Chimombo[1,4]

Abstract

Background The push towards commercialization is driven by the modernization paradigm which argues that traditional subsistence farming is backward and primitive. Despite commercialization having the potential to enhance people's livelihoods, it can also bring unfathomable social differentiation and widen inequalities in communities. This paper investigates the gendered decision-making and expenditure choices of smallholder households in the context of agricultural commercialization in Central Malawi.

Methods The analysis is performed by employing sequential mixed methods of quantitative and qualitative data collection, consisting of 28 focus group discussions, 100 life histories, and 519 surveys. Qualitative data were analysed using thematic content analysis while quantitative data were analyzed using descriptive and various regression estimations.

Results The results show that many men heads make decisions on cultivated plots and control realized income. The results further show that there are no differences between households headed by women and those headed by men in pursuit of markets. Women's participation in markets is limited by lack of means of production. Men are getting more involved in crops that were dominated by women such as groundnuts. Women plot managers engaged more with markets, but their control of realized income was less associated with reinvesting in crop commercialization which is also reflected in their expenditure choices. When they control income, women spend relatively less than men on both productive and households assets. In households headed by men, the men dominate selling of produce, decisions on the control over resources, income, and expenditure choices, which results in deepening gender inequalities.

Conclusions Differences exist in expenditure choices between women and men which points to differing priorities and disparities in access to productive resources. Men dominate decision-making which is preferred by some women to maintain intrahousehold harmony. There is need to create targeted programs for diverse groups of women through participatory approaches to address strategic needs. Women unable to farm due to lack of means of production need social protection programs. Women without decision-making power require empowerment initiatives and gender dialogue sessions to foster joint household activities. Commercial based interventions should go beyond mere targeting of women and men but embed equality interventions to avoid deepening social inequalities.

*Correspondence:
Loveness Msofi Mgalamadzi
loveness.msofi@gmail.com
Full list of author information is available at the end of the article

Keywords Gender, Household decision making, Expenditures, Smallholder farmers, Agricultural commercialization, Malawi

Background

Poverty remains widespread in Africa and across sub-Saharan Africa (Bachewe et al. 2018; Barrett et al. 2018), where many people depend on agriculture for food security and livelihoods. Despite the importance of agriculture in SSA, evidence suggests that its productivity lags other regions (Bachewe et al. 2018; Barrett et al. 2018). For instance, over the past few decades, productivity in South Asia has tripled, while it has grown six times in East Asia (Fuglie et al. 2020). For Africa, agricultural productivity doubled only during the period running from 2000 to 2018 due to expansion of cultivated area and improvements in grain yields (Jayne and Sanchez 2021). The importance of accelerating agricultural productivity and transforming the sector is heightened in Sustainable Development Goal (SDG) 2 aimed at ending hunger, achieving food security and improved nutrition, and promoting sustainable agriculture. Likewise, at national level, agricultural productivity and commercialization are among the priority aspirations described in the Malawi 2063 development strategy (GoM 2020). The initiatives are driven by the modernization narratives to agricultural development that view a shift from subsistence to market-based production and consumption as desirable (Amin et al. 2018). However, the question; 'desirable for whom?' has been put across by those who have written about social differentiation and the changing gender dynamics amidst smallholder commercialization, which has implications for inequalities (Dancer and Hossain 2018; Dancer and Tsikata 2015; Djurfeldt, et al. 2018a, b; Doss et al. 2014; Dzanku et al. 2021).

Smallholder agricultural commercialization—which refers to the proportion of household harvests that are sold (Pingali and Rosegrant 1995), has the potential to enhance people's livelihoods and improve their standards of living (Abdullah et al. 2019; Carletto et al. 2017; Ogutu et al. 2019; Radchenko and Corral 2018). It can also bring unfathomable social differentiation and widen inequalities in communities. It is against the backdrop that gender differences exist in division of labour, access to and control over resources, including land, and control over decision-making on the use of income and other benefits accrued (Quisumbing et al. 2014), which in most instances favors men at the expense of women. There are costs associated with such gender gaps and social inequalities, including rendering smallholder agricultural commercialization non-inclusive and deepening poverty and other negative outcomes, which affects progress towards achieving SDGs (FAO et al. 2015; UN Women 2015).

In recent years, there has been compelling empirical evidence on gender and social differentiation in agriculture with emphasis on the crucial role of women in agriculture as producers of food, stewards of the environment and providers of labor, among others (Doss et al. 2018; Sraboni et al. 2014). However, women occupy a disadvantaged position whose productivity lags that of men (Croppenstedt et al. 2013; Kilic et al. 2013), because of enormous time poverty due to their triple gender roles of production, reproduction and community organization (Mdee et al. 2020). The returns to women's labor and other resources are limited (Quisumbing et al. 2014) and tend to focus on low-value crops such as maize, groundnuts and soyabeans relative to men who venture into lucrative cash crops (Lifeyo 2017; Oduol et al. 2017; Orr et al. 2016). While women's involvement in market-based farming enhances their income opportunities (Mojirayo 2014), it also has the potential to increase their workload (Orr et al. 2016) and affect other roles they play such as ensuring household food security (Handschuch and Wollni 2015). Furthermore, women (both from the MHH and FHH) tend to be demotivated due to unstable markets and inadequate benefits from commercialization, as men tend to control realized income especially for those in MHH (Aberman and Roopnaraine 2020; Fischer et al. 2011; Handschuch and Wollni 2015).

There are, however, merits for closing the gender gap, with studies showing positive expenditure outcomes on education, health, and nutrition when women control resources (FAO 2015; Kenayathulla 2016; Nisbett et al. 2016; Sraboni et al. 2014). In Nigeria, increasing the share of women's income improved expenditures on food, children's clothes, school fees and energy for households (Opata et al. 2020). Similar results were reported by (Hopkins et al. 1994) in Niger and (Hoddinott and Haddad 1995) in Cote d' Ivoire. Nevertheless, others have shown that different domains of women's empowerment affect outcomes differently (Amugsi et al. 2016; Aromolaran 2009; Cunningham et al. 2015; Malapit and Quisumbing 2015), suggesting that the effects vary by context. None of these studies analyzed the effects of increasing the decision-making of women on expenditures in the context of commercialization. However, the effectiveness of interventions promoting increased smallholder farmer participation in markets

and welfare benefits, including social expenditures, are mediated by gender and social norms influencing decision-making for farm activities and income use. To achieve gender inclusivity from policies and programmes supporting smallholder commercialization, there is a need for a better understanding of the outcomes of household decision-making processes. This study is, therefore, aimed at investigating the gendered decision-making and expenditure choices among smallholder households engaged in commercialisation.

Conceptual framework

Figure 1 presents the conceptual framework linking individual, household, and society characteristics to differentiated gender relations about expenditure choices and decisions regarding commercial agriculture. In debates about gender relations, the position of the household head in relation to other household members is important. Unlike in a unitary model where the household head, a term synonymous with decision-maker (Meijer et al., 2015), aims at meeting the household common welfare, individual preferences could be different and may likely be contested and require negotiation—a need recognized by collective models. Relatedly, expenditure choices are connected to household decision-making and may depend on gender of a decision maker and intra-household dynamics (Quisumbing 2003).

The study conceptualizes that in the context of smallholder agricultural commercialisation, women and men who are also different based on their individual characteristics, whether it is a household headed by a woman or a man, and from different cultural setting (matrilineal vs patrilineal) are subject to different gender relations in terms of who makes decisions, who has access to what, who does what, who controls what and who owns what (Bernstein 2010). This differentiation results in different expenditure choices and consequently differentiated livelihood outcomes. Studies have shown that in households headed by men, women are less empowered than in households headed by women, but livelihoods of those households headed by men are better than those households headed by women (Msofi 2024).

The concept of social differentiation helps to understand differences among women and men in decision-making and expenditure choices within the context of commercialization and the implications of such differences in their livelihoods. According to Dancer and Hossain (2018), gender is one of the most significant dimensions of social differentiation. This is the case because gender determines the social power relation, asset accumulation, and livelihood opportunities both inside and outside households (Dancer and Hossain 2018). This determines the division of labour, care and reproductive responsibilities, decision making, control and access to resources and benefits versus access to employment opportunities, leadership positions, and casualization and feminization of labour.

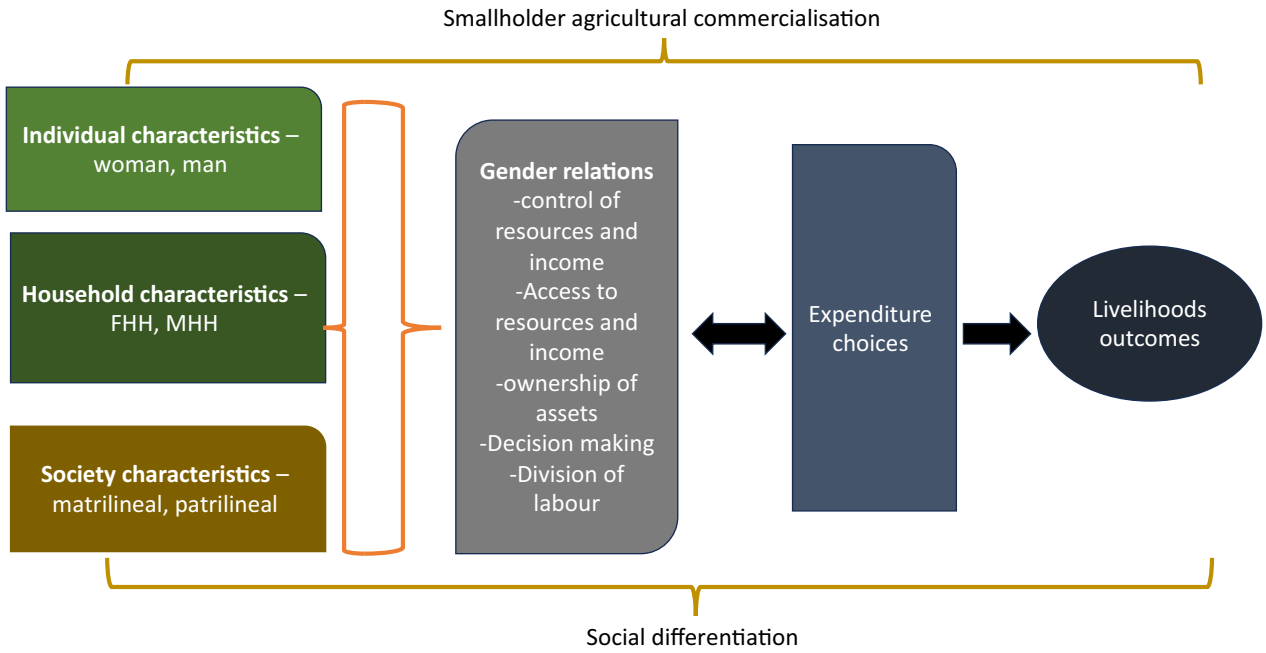

Fig. 1 Conceptual framework

Methods

Data collection and sources

This study used data from wider data collection efforts that were conducted as part of Agriculture Policy Research in Africa (APRA) programme that investigated commercialization of smallholder farmers in Mchinji and Ntchisi districts in central Malawi (Matita et al. 2018). The APRA study tracked households that were surveyed as part of Agricultural Input Subsidy Programme (AISP) evaluation by the School of Oriental and African Studies (SOAS) in collaboration with the National Statistical Office (NSO) in the 2006/2007 farming season. The AISP study randomly sampled 240 households. These households were followed up in 2018 in APRA data collection, and a total of 217 original households were interviewed (103 from Mchinji district and 114 from Ntchisi district). This represents an attrition rate of 90 percent, which is comparable to other longitudinal surveys (Thomas et al. 2012). Original household members who had started their own livelihoods at the time of the follow-up survey were also interviewed separately. A total of 302 branching out households (143 from Mchinji district and 159 from Ntchisi district) were surveyed. The analysis for this paper combines both original households (217) and branching out households (302) giving a total of 519 respondents.

Sequential data collection was conducted. In 2018, we began with focus group discussions (FGD) to collect qualitative data and individual interviews to obtain quantitative data. FGDs were conducted until a saturation point where interactions were not generating new information (Guest et al. 2020). This was reached after conducting a total of 28 FGDs. We conducted FGDs separately with women and men farmers. The associated data collection tools asked questions about crop production, harvest, and marketing activities and demographic and socioeconomic characteristics of the households, including income sources, expenditure and asset holding patterns. Additional information on food and nutrition security, shocks and coping mechanisms was also collected. One of the limitations of this research stems from its foundation which is based on a larger study centered on pathways to agricultural commercialisation with one of the focuses being gender dynamics. Despite this broader scope, study tools included modules specifically dedicated to gender issues within the context of agricultural commercialisation. Future research should undertake studies that are exclusively focused on gender and commercial agriculture.

The APRA study categorized households into various livelihood trajectories based on the Dorward framework (Dorward 2009). The process of determining the livelihood trajectories is documented elsewhere (Matita et al. 2021). In summary, the livelihood trajectories included households that are hanging in (barely surviving in their agricultural livelihoods), stepping up (investing and expanding their agricultural enterprises), stepping out (moving on to nonagricultural enterprises such as salary work or business), dropping out (relying on social assistance/remittances and piece work commonly called *ganyu*) and those that are stepping in (new people starting to engage in agricultural enterprises).

We randomly selected and interviewed 12 original households and 8 branching-out households for each livelihood trajectory which gave us a total of 100 life history interviews. This is consistent with recommendations about plausible sample for qualitative studies (Guest et al. 2006, 2020). The life histories documented the role of agriculture commercialization through different stages of life (i.e., childhood and adolescence, youth, young adulthood, late adulthood, and older age). The study protocols were approved by the National Committee on Research in the Social Sciences and Humanities (NCRSSH) in Malawi.

Data processing and analysis

Qualitative data management and analysis

We used thematic analysis to identify, analyze, and report patterns and themes within the qualitative data. Data was recorded, transcribed, and coded using Atlas.ti 8. This allowed us to manage the data and generate themes, codes, and quotations. We initially created a comprehensive list of qualitative data codes, which were later merged to identify closely related and similar themes. The development of the codes was an iterative process that involved several code validation meetings by the research team.

Quantitative data management analysis Quantitative data from individual interviews were analyzed using descriptive statistics and regression estimations in STATA 13. The estimations used cross-section data analysis.

(a) Drivers of agricultural commercialization

To determine the drivers of agricultural commercialization, the following equation was estimated consistent with previous studies (Carletto et al. 2017; Sibande et al. 2017).

$$CCI = \alpha + hh + cp + \varepsilon \quad (1)$$

where CCI is the crop commercialization index for households defined as the proportion of crops harvested that are sold; *hh* represents household demographic and socioeconomic characteristics, including assets and land holdings, the gender of the household head, household

size and composition; *cp* represents cropping patterns, such as the hiring of agricultural labor and crop diversification, defined as the number of crops cultivated and the use of commercial fertilizer; and *e* is the error term. The model was estimated using fractional logit analysis since the dependent variable CCI values range between zero and one (Ogutu and Qaim 2019; Papke and Wooldridge 1996; Woodridge 2010).

(b) Gendered decision-making effects on commercialization

To establish the effects of gendered decision-making on crop commercialization, Eq. (1) above was estimated. However, we added variables reflecting decision-making at the household level. Specifically, dummy variables determine whether decisions on crop income use are made by the men head or women head. Joint decision-making on how to use crop sales income was used as the base category. Another key variable here is the gender of the plot manager. A plot manager is a person who makes decisions about crop choice, input use and timing of cropping activities. This study captured whether these decisions were made by a household head who is either a man, woman or jointly. Similarly, the fractional logit model was used to analyze the cross-sectional data.

(c) Expenditure choices in the context of commercialization

Further analysis was conducted to determine how the gender of a decision maker on a plot on how to use crop sales income affects expenditure choices of households. Several probit estimations were conducted to determine the probability of spending realized income on assets, health, education, food, farm inputs, communication, energy, and transport in the context of commercialization. Here, the following regression was estimated:

$$exp = \alpha + hh + dcsn + CCI + \mu \quad (2)$$

where *exp* is a dummy variable equal to one if a household spent on assets, food, farm inputs, etc., zero otherwise; *hh* represents household demographic and socioeconomic characteristics; *dcsn* represents the gender of the person making decisions on how to use crop sales income and the plot manager; and *CCI* is the crop commercialization index. Other control variables were also included. A detailed description of key variables and their measurement is presented in Table 1. These variables have been identified based on the literature suggesting that they drive outcomes of interest, such as agricultural commercialization and expenditure choices (Abdullah et al. 2019; Ogutu and Qaim 2019; Pingali and Rosegrant 1995; von Braun 1995; Von Braun and Kennedy 1994).

Table 1 Description of variables used in models

Variables	Description
CCI	Gross value of crop sales/gross value of crops produced * 100; takes values [0,1]
Man-headed household	1 if household head is a man, 0 otherwise
Age of head	Age of household head in years
Household size	Adult equivalents
Education	Maximum years of schooling in a household
Land holding	Total land holding size in hectares under crop cultivation by household
(Log) Land productivity	Value of crop output per hectare
Purchased commercial fertilizer	1 if purchased commercial fertilizer, 0 otherwise
Hired labor	1 if hired agricultural labor, 0 otherwise
Crop diversification	Number of crops cultivated
Food security	1 if household reported adequate food in the past month, 0 otherwise
Livestock ownership	Total Livestock Units (TLU)
Gender typologies	1 if household has only men adults, 0 otherwise. 1 if household has only women adults, 0 otherwise. 1 if household has dual sex adults, zero otherwise (used as base category)
Control of crop income	1 if man head controls use of crop income, 0 otherwise. 1 if woman head controls income, 0 otherwise. 1 if joint control of income, 0 otherwise (used as base category)
Plot manager	1 if man head is plot manager, 0 otherwise. I if woman head is plot manager, 0 otherwise. 1 if joint plot management, 0 otherwise (used as base category)
Asset holding	(log) value of durable assets (Malawi Kwacha) Asset index generated by principal component analysis
Expenditure	D = 1 if expenditure is on food, health, education, farm inputs, communication, transport, and assets, 0 otherwise
District	1 if Mchinji district, 0 otherwise. 1 if Ntchisi district, 0 otherwise (used as base category)

Table 2 Characteristics of study participants (n = 519)

Characteristics	MHH	FHH	Test of mean difference by sex of household head—p-values
Sex of the household head (%)	82	18	***
Age of household head (mean)	45 years	46 years	–
Total household income (mean Malawi Kwacha)	562,008.55	152,272.31	**
Number of years in school (mean for household head	6	4	***
Economic activity (%)	95	72	***
Household size (mean)	7	7	–
Plot size (mean)	1.75hectares	0.75 hectares	***

Based on the current value, 1 dollar is equivalent to 1,751 Malawi Kwacha

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Results

Description of study participants

Table 2 outlines the socioeconomic attributes of the study respondents. This analysis encompasses a total of 519 survey respondents comprising both original households and those that branched out.

From the data presented in Table 2, it is evident that most of the households are headed by men. There are significant disparities in total household income as households headed by men exhibit considerably higher incomes compared to households headed by women. Once more, notable differences are evident in education as women heads tend to have fewer years of schooling compared to men heads. Moreover, there are significant distinctions in economic activity and average plot sizes, with households headed by women being less likely to engage in economic activities and possessing considerably smaller plot sizes compared to their men headed counterparts.

Descriptive statistics

Table 1 presented descriptive statistics of the variables used in the modeling. On average, households sold 57 percent of their harvest with slight differences among men and women headed households. Largely, the households are headed by men with an equivalent of 4 adults in household size. Close to 10 percent reported having men adults only, while 11 percent had women adults only, suggesting that the proportion of households with dual-sex adults was higher. In close to 60 percent of the households, men control crop income, while women control income in approximately 20 percent of the households. With respect to the gender of the plot manager, a similar trend was observed, with men reportedly making most of the plot-related decisions than women as shown in Table 3.

Figure 2 shows the proportion of households reporting different expenditure items. The primary expenditure of over 70 percent of the households surveyed is on food items. This was followed by expenditures on farm inputs and health. The least three expenditure items were on energy, assets, and remittances. Based on Fig. 2, it is evident that in nearly all expenditure categories, a higher proportion of households headed by men report spending money compared to those headed by women. The

Table 3 Descriptive summary of variables

	All households (2018)		Test of mean difference by sex of household head
Variable	Mean	SD	P-value
CCI	0.57	0.36	*
Age of household head	42.5	17.3	
Adult equivalents	4.01	2.12	**
Man headed household (0/1)	0.84	0.37	–
Men adults only (0/1)	0.10	0.30	–
Women adults only (0/1)	0.11	0.31	***
Man head control income (0/1)	0.66	0.48	***
Woman head control income (0/1)	0.17	0.38	***
Man head is plot-manager (0/1)	0.67	0.47	***
Woman head is plot-manager (0/1)	0.15	0.36	***
Log value of durable assets	3.41	1.70	–
Adequate food past month (0/1)	0.38	0.49	*
Total livestock units	0.58	1.37	**
Land size (ha)	1.48	2.59	***
Land productivity	10.6	3.50	–
Hired labor (0/1)	0.30	0.46	**
Purchased fertilizer (0/1)	0.56	0.50	–
Number of crops cultivated	2.80	1.57	**
Mchinji district (0/1)	0.48	0.50	–
Number of observations	560		

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

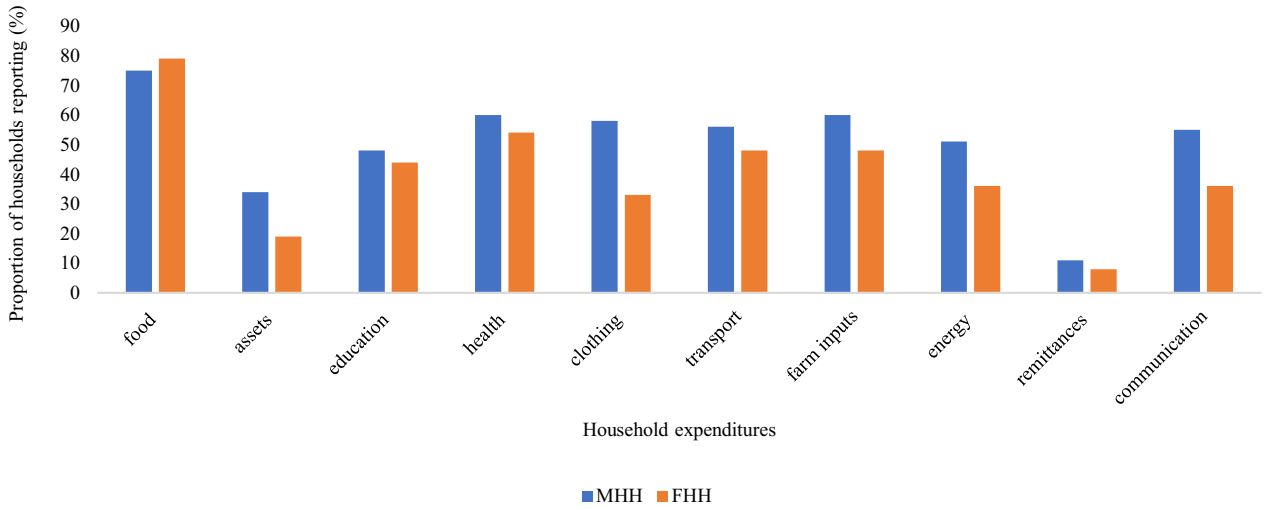

Fig. 2 Proportion of households reporting expenditure items (%)

exception is on food, where more households headed by women report spending their money on this item.

The extract from a life history interview below illustrates how expenditure choices are made in a typical farming household in Malawi.

> *'My parents were farmers growing a variety of crops. The money realized from the sale of groundnuts and piece work was spent on various items, with food being a priority. The household would then decide on farm inputs needed and household necessities such as soap, salt, and clothes in that order. The decisions on expenditure choices were dominated by my father. During my youth, I briefly stayed at my sister's place. Again, my sisters' husband made all the decisions, including regarding expenditure choices. (Life history interview with a woman, Mchinji District).*

Drivers of crop commercialization

Table 4 presents the drivers of crop commercialization obtained from fractional logit models based on cross-sectional analysis of all households (model I). The findings show that households that have a higher value of durable asset holding experience over a 15.6 percent increase in CCI ($P < 0.01$). The effect of having adequate food is positive showing an increase in CCI by a margin of 4 percent. The results further show that higher land productivity is associated with a greater extent of market participation, in line with other studies (Olwande et al. 2015; Rios et al. 2008). Furthermore, diverse crop cultivation is associated with higher crop

Table 4 Drivers of crop commercialization

Dependent var: CCI	All HH in 2018 (Cross-section analysis)	
	Model I	
	dy/dx	SE
Log age of household head	− 0.183	(0.162)
Adult equivalents	− 0.105***	(0.032)
Man headed household (0/1)	0.028	(0.037)
Men adults only (0/1)	− 0.009*	(0.005)
Women adults only (0/1)	0.012**	(0.005)
Log value of durable assets	0.156***	(0.033)
Adequate food past month (0/1)	0.040***	(0.011)
Total livestock units	0.009	(0.006)
Land size (ha)	− 0.004	(0.011)
Land productivity	0.275***	(0.054)
Hired labor (0/1)	− 0.035***	(0.010)
Purchased fertilizer (0/1)	− 0.032*	(0.016)
Number of crops cultivated	0.122***	(0.028)
Mchinji district (0/1)	0.012	(0.013)
Pseudo R-squared	0.084	
Log likelihood	− 350.050	
Chi-squared	110.775***	
Number of observations	560	

Model I presents cross-section fractional logit estimates of drivers of commercialization among sampled households in 2018. First, (0/1) indicates dichotomous variables for the stated category equal to 1, otherwise equal to 0 for the base category. The incidence rate ratio (IRR) is the ratio of the expressed category to the base category. IRR is incidence of count = exponential of intercept plus coefficient times the value of X. dy/dx = Average marginal effects. Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

commercialization, supporting (Sibande et al. 2017) findings in the context of maize commercialization in Malawi. Any additional crop cultivated increases the CCI by 12.2 percent. In contrast, large household sizes and the hiring of agricultural labor reduced the extent of crop commercialization. This possibly reflects the greater food requirements for large households and the reliance on family labor for production in this context where households produce their own food.

The following quote illustrates characteristics of households participating in markets, which confirms the drivers of crop commercialization:

> *"They can hire labor to complement available family labor. They own productive assets and farm implements, including oxcart, and they can have access to mechanized implements. They also have a few large animals, such as cattle, and high-value animals, such as pigs. They grow a wide range of crops, including tobacco, which is considered the main cash crop. They have food most of the season, but they can also buy food when it runs out." (FGD with men in Ntchisi district).*

In contrast, the following quote illustrates barriers to market participation: *"Poorer households are less likely to participate in markets because they do not have capital and labour. They may own land but fail to farm because they do not have seeds and fertiliser, so they end up renting the land out. To survive they do piecework. They sometimes access government subsidized inputs, but they end up selling the coupons/voucher to buy food which is their immediate need."* (FGD with women in Mchinji).

This study finds no significant association between sex of the household head and crop commercialization. A weak relationship, however, is observed when considering the gendered composition of the households. We find that men adults only households weakly participate in markets (with a marginal effect of 0.9 percent) relative to those with dual adults ($p < 0.10$). In contrast, households with women adults only experienced a 1.2 percent higher extent of commercialization ($P < 0.05$) relative to those with dual adults. This finding is contrary to the literature suggesting that women lag men in market participation (Djurfeldt et al. 2018a, b; Mutabazi et al. 2013) but may well reflect increased levels of women's engagement with agricultural markets due to gender awareness and empowerment work by Nongovernmental organization in Malawi (MacIntyre et al. 2013). It seems crop marketing is the primary source of income to meet basic needs in households with women adults only. Conversely, the data showed that households with dual adults significantly engage in salaried work ($p < 0.05$) and business ($p < 0.01$).

Gendered decision-making in the context of commercialization

Decision-making at the household level affects the access, use and control of productive resources, which in turn mediates crop commercialization and the benefits from agriculture (Quisumbing et al. 2014). Qualitative findings show that in households headed by men, it is the man that dominates decision-making in agricultural activities but also control the use of resources such as land and income. The following quotes illustrate the situation: *"I am the one that makes all decisions because I am the head and a man"* (Focus group discussion with men in Ntchisi district). We find in Table 5 variation in the results based on the gender of the person who makes decisions. The results indicate that women plot managers are associated with higher levels of commercialization compared to where plot level decisions are made jointly. Specifically, such households experience a 2.2 percent increase in CCI ($p < 0.5$). Even so, the associated extent of commercialization is reduced by 1.5 percent when the woman head controls income compared to decisions made jointly ($p < 0.10$).

Table 5 Gendered decision-making effects on crop commercialization

Dependent var: CCI	dy/dx	SE
Log age of household head	0.001	(0.167)
Adult equivalents	− 0.097***	(0.030)
Man headed household (0/1)	0.044	(0.044)
Men adults only (0/1)	− 0.007	(0.005)
Women adults only (0/1)	0.012**	(0.005)
Man head control crop income (0/1)	0.028	(0.023)
Woman head control crop income (0/1)	− 0.015*	(0.009)
Man head is plot manager (0/1)	− 0.044	(0.031)
Woman head is plot manager (0/1)	0.022**	(0.010)
Log value of durable assets	0.146***	(0.036)
Adequate food past month (0/1)	0.035***	(0.010)
Total livestock units	0.004	(0.007)
Land size (ha)	0.007	(0.012)
Land productivity	0.593***	(0.097)
Hired labor (0/1)	− 0.031***	(0.010)
Purchased fertilizer (0/1)	− 0.025	(0.017)
Number of crops cultivated	0.151***	(0.032)
Mchinji district (0/1)	0.010	(0.013)

Table presents fractional logit estimates of drivers of commercialization based on cross-sectional data of households in 2018. (0/1) indicates dichotomous variables for the stated category equal to 1, otherwise equal to 0 for the base category. Standard errors are presented in in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Qualitative findings reveal that women sometimes accept that men have an upper hand in decision-making not only for the sake of peace and harmony but also as a strategy for negotiating access to certain resources and privileges, and these quotes provide the evidence:

> *"Both of us were involved in selling produce at a nearby market. However, it is my husband that makes decisions and has control. If I am to access the produce or the money, I must ask for his permission. As a woman, I am not in control. I must obey my husband [as stated in the Christian Holy Bible, Ephesians 5:22-23] and that is what I do…" (Life history interview with a woman in Ntchisi district).*

The study also found that women prefer joint decision-making which they think gives them an opportunity to address their interests. These quotes illustrate this finding:

> *"my husband does things differently than most men in this village. He allows for joint decision making, control and access to resources and income which is helpful in market-based farming, and we can take care of our family." Life history with a woman in Ntchisi.*

We further observed that in cases where women's involvement in decision-making is high or even higher than men due to improved agency and empowerment, the community negatively labelled such empowered women as a form of negative social sanction for deviating from expected cultural standard which demands men to lead and women to be passive and submissive followers of their husbands. For example, such women are seen as being rebellious as noted in this quote: *"My father made most of the decisions affecting us, but my mother was also active—she was actively involved in picking tobacco, making tobacco bales, constructing a shed, including going to the auction floors to sell tobacco. She could do anything that a man could do but was labelled as man* (Life history interview with a man in Mchinji district*).* Further, it is not only the woman who is punished by the society, but also the man who is seen to be allowing his wife to be domineering or engages in joint decision-making with the wife is also negatively socially sanctioned by being labelled as a 'man under peat coat government', denotating that the man is being ruled by a woman. This is done to dissuade and discourage men from allowing equal power in the decision-making sphere in their marriages.

Additionally, we found that women often fail to utilise their social networks to bridge their participation in markets. The following quotes illustrates challenges to acquiring skills and information about tasks that are dominated by men in the household:

> *"I stopped cabbage production upon the death of my husband. I noticed I do not have the skills to do it even though my husband was very knowledgeable about the enterprise" (Life history interview with a woman in Mchinji district). "My husband finds market for the farm produce; for instance, he makes a relationship with a person who has a license of selling tobacco at Kanengo then he sells his tobacco through that person. Some money is given to the person owning a license" (Focus group discussion with women in Mchinji district).*

Findings also show a shift in crops that men and women concentrate on. Traditionally, tobacco and other cash crops used to be mostly controlled by men while women concentrated on groundnuts and maize or other food crops. However, this is increasingly changing as more men are also concentrating their efforts in growing groundnuts, soybean, and other crops other than tobacco because of challenges faced in tobacco production and marketing. The following quote provides evidence:

> *"Before the year 2000 groundnuts was called "mbewu ya azimayi" [women's crop] because it was mainly grown for consumption and by women while Tobacco was grown mainly for cash crop by men and was called "mbewu ya azibambo" [men's crop]. (FGD with women and men in Mchinji district)*

We also noted that despite the involvement of women in majority of the production activities, they tend to be missing in marketing activities which are dominated by men. The following quote illustrate this finding: *"The time we were growing up, it was clear that crop marketing was my father's main domain. He was the one that was involved in selling the crops, and he was in control of the money realized"* (focus group discussion with women in Mchinji district).

Gendered decision-making and expenditure patterns in context of commercialization

The regression estimates in Table 5 show that the probability of spending money on assets, energy and clothes strongly increases in households headed by men relative to households headed by women by 12.3, 16.0 and 24.8 percent, respectively. In households with only woman or man adults, expenditures are less likely to be made toward assets, energy, remittances, and communication compared to households with dual-sex adults. Additionally, households with women adults only are 1.3 percent less likely to make expenditures on farm inputs ($p < 0.10$) as shown in Tables 6 and 7.

The results in Tables 6 and 7 highlight that when women and men heads control crop incomes, they are

Table 6 Effect of the gender of the decision maker in a household on expenditure choices

Type of Expenditure	Food		Asset		Education		Health		Transport	
	dy/dx	SE	dy/dx	SE	dy/dx	SE	dy/dx	SE	dy/dx	SE
Age of head (years)	0.221	(0.264)	− 0.512*	(0.299)	1.001***	(0.352)	− 0.454	(0.309)	0.331	(0.311)
Age of head squared	− 0.085	(0.129)	0.183	(0.146)	− 0.488***	(0.173)	0.176	(0.150)	− 0.178	(0.150)
Adult equivalents	0.075**	(0.036)	− 0.029	(0.044)	0.294***	(0.052)	0.129***	(0.046)	0.019	(0.050)
Man headed household	− 0.044	(0.046)	0.123**	(0.058)	0.043	(0.055)	− 0.008	(0.055)	0.053	(0.057)
Maximum year of schooling	0.166***	(0.039)	0.069	(0.052)	0.077	(0.049)	0.164***	(0.049)	0.184***	(0.050)
Men adults only (0/1)	− 0.008	(0.007)	− 0.008*	(0.004)	− 0.006	(0.006)	0.007	(0.007)	− 0.002	(0.007)
Women adults only (0/1)	–0.002	(0.007)	− 0.009*	(0.005)	− 0.002	(0.007)	0.016**	(0.008)	0.011	(0.008)
Man head control crop income (0/1)	0.027	(0.025)	0.080**	(0.032)	0.017	(0.031)	0.021	(0.031)	0.038	(0.031)
Woman head control crop income (0/1)	− 0.020	(0.013)	0.026***	(0.010)	− 0.004	(0.010)	− 0.025**	(0.011)	0.021*	(0.011)
Land (ha)	− 0.006	(0.014)	0.002	(0.014)	0.045***	(0.011)	− 0.007	(0.014)	0.013	(0.013)
Log value of assets (MK)	0.046	(0.046)	0.267***	(0.051)	0.054	(0.051)	0.068	(0.053)	0.233***	(0.050)
Total Livestock Units	− 0.046***	(0.009)	0.001	(0.011)	− 0.014	(0.010)	0.011	(0.009)	− 0.031***	(0.012)
Number of crops cultivated	− 0.100**	(0.039)	− 0.015	(0.038)	− 0.028	(0.038)	0.031	(0.042)	0.029	(0.039)
Crop commercialization index	0.024	(0.027)	0.035	(0.033)	0.041	(0.033)	0.002	(0.035)	0.023	(0.034)
Mchinji district	− 0.051***	(0.020)	0.015	(0.019)	0.005	(0.019)	− 0.080***	(0.021)	− 0.074***	(0.019)

Standard errors in parentheses

* $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table 7 Effect of the gender of the decision maker in a household on expenditure choices

Type of Expenditure	Farm Inputs		Energy		Communication		Clothes		Remittances	
	dy/dx	SE	dy/dx	SE	dy/dx	SE	dy/dx	SE	dy/dx	SE
Age of head (years)	− 0.657**	(0.287)	0.151	(0.315)	− 0.356	(0.268)	0.181	(0.323)	0.158	(0.174)
Age of head squared	0.321**	(0.137)	− 0.098	(0.151)	0.060	(0.129)	− 0.119	(0.156)	− 0.047	(0.085)
Adult equivalents	0.007	(0.048)	0.027	(0.049)	0.111**	(0.045)	− 0.038	(0.047)	− 0.055**	(0.023)
Man headed household	0.038	(0.050)	0.160**	(0.065)	− 0.084	(0.054)	0.248***	(0.062)	− 0.045	(0.037)
Maximum year of schooling	0.034	(0.047)	0.110**	(0.054)	0.082*	(0.047)	− 0.011	(0.052)	0.056	(0.037)
Men adults only (0/1)	0.000	(0.006)	− 0.021***	(0.004)	− 0.011**	(0.005)	− 0.022***	(0.004)	− 0.005**	(0.002)
Women adults only (0/1)	− 0.013*	(0.007)	− 0.015**	(0.006)	− 0.012**	(0.005)	0.000	(0.008)	− 0.006***	(0.001)
Man head control crop income (0/1)	− 0.016	(0.030)	-0.024	(0.033)	0.078***	(0.029)	0.095***	(0.031)	0.006	(0.020)
Woman head control crop income (0/1)	0.006	(0.011)	0.013	(0.012)	0.012	(0.009)	0.010	(0.011)	− 0.001	(0.005)
Land (ha)	0.021	(0.016)	0.019	(0.016)	0.020	(0.014)	− 0.003	(0.014)	0.006	(0.009)
Log value of assets (MK)	0.258***	(0.048)	0.013	(0.055)	0.470***	(0.044)	0.142***	(0.051)	0.153***	(0.042)
Total Livestock Units	0.006	(0.009)	− 0.009	(0.012)	− 0.015	(0.010)	− 0.021**	(0.010)	− 0.016***	(0.006)
Number of crops cultivated	0.196***	(0.038)	0.030	(0.043)	− 0.059	(0.038)	0.074*	(0.041)	0.052	(0.033)
Crop commercialization index	0.020	(0.032)	− 0.006	(0.035)	0.075***	(0.029)	0.016	(0.034)	− 0.034*	(0.018)
Mchinji district	− 0.038**	(0.018)	0.053***	(0.020)	− 0.053***	(0.017)	− 0.009	(0.019)	− 0.010	(0.010)

Standard errors in parentheses

* $p<0.10$, ** $p<0.05$, *** $p<0.01$

both likely to spend it on assets, with a higher likelihood for men (8 percent) than women (2.6 percent), supporting findings by others that men spend a greater proportion of their income on assets compared to women in Ghana and Malawi (Njuki et al. 2011). Men heads that control incomes are also likely to spend it on communication and clothes. However, the likelihood for women who control income to spend on transport is 2.1 percent higher ($p<0.10$) than when joint control is used. The results further indicate that the possibility of women heads that control income to spend on health is 2.5 percent less ($p<0.05$) relative when joint control of income is exercised. Greater CCI is associated with the higher likelihood of spending on communication by 7.5

percent ($p < 0.01$) but less so on remittances by 3.4 percent ($p < 0.10$). However, this study did not collect data on leisure expenditures, which was reportedly a common occurrence when men control crop sales income in qualitative interviews as this quote illustrates; *"some men when they get money, they like using it to have fun, some even reach a point of marrying another wife and they spend the family hard earned money on the other women."* FGD with women in Mchinji. "*Many men engage in excessive beer drinking after selling crop produces leaving the spouse and kids with nothing.*' FGD with women in Ntchisi.

Discussion

From the analysis, several narratives emerged regarding gendered decision making, expenditure choices and commercialisation: First, men dominate decision-making in the households. Men are perceived by the community at large as heads of household and are therefore responsible for leadership in the house (Mudege et al. 2015). This leadership entails deciding on all activities around the house, including production and marketing of agricultural goods and use of realized incomes. This position of men is often accepted in the society and is sometimes approved even by women and is embedded in the social cultural orientation of the study population, influencing the gendered division of roles in the household. The men make all decisions and where needed instructs the women on what they should undertake. In such households, the women have neither a voice nor control over expenditures, since when men control production, they have also been found to control realised incomes (Fischer and Qaim 2012; Handschuch and Wollni 2015). It was also observed that even in cases where a woman owns cultivatable land (through inheritance or purchase), the decisions on how to use the land, including crop choices, were made by men, and often, the choices favor the interests of men. The difficulties with this occurrence were found to be worse in the context where the man owns the land as in such cases the woman is not considered as part of the wealth and therefore totally excluded from decision-making.

Second, the idea of men overseeing decision-making is viewed differently among different people and under different circumstances. In some cases, women accept that men have an upper hand in decision-making. According to these women, the men are the ones that provide for the household, and it is difficult for women to assume this role. This contradicts with what others have found that women and men when interviewed separately, would claim to have authority in decision-making (Anderson et al. 2017). The results bring out an interesting nuance to the debates on decision-making in relation to agricultural development, as often it is assumed that because women are not the ones that make production decisions (Quisumbing et al. 2014), they are against the idea. Often, they accept their position to maintain peace in the household, sometimes because of the cultural and religious beliefs, but also as a strategy for bargaining (Sikweyiya et al. 2020). Others have also argued that it is important not to always assume that women are victims but rather to understand their preferences and priorities (Doss et al. 2018). The findings about the central role of men indecision-making accords with the unitary household approach where the altruistic household head is responsible for ensuring that the welfare of the household is achieved (Agarwal 1997). Others who subscribe to Karl Marx's conflict theory may attribute false consciousness to women's contentment and happiness with men dominating in decision-making. According to Marx and Engels (1975), as cited in (Eyerman 1981), false consciousness occurs when victims of oppression and exploitation not only defend but also enjoy and express gratitude with their own victimizations. Usually, culprits use culture and religion to create a mental state and social orientation that promote false consciousness in their victims. From this perspective, it is wrong to see the women in the study areas in Mchinji and Ntchisi as truly happy and choosing oppression on their own volition but rather victims of strong and overarching cultural and religious structures that are rooted in patriarchy. The distinction between the former and later view is very significant, as the former entails maintaining the status quo of women subjugation, while the Marxist view calls for action that not only emancipates women but also empowers them by dismantling the social institutions and structures that are the source of their false consciousness.

Third, a notable limitation to women's market participation is related to the failure of women to use their social networks to bridge their market participation. This is in addition to challenges in accessing farm inputs and physical labor for production, as described elsewhere (Djurfeldt et al. 2018a, b). Instead, women often use bonding social networks such as assisting each other at weddings or during sickness but not necessarily those activities that would support their pursuits of markets. This points to the failure of women to use their networks to effectively leverage access to productive resources (Kabebe and Butterfield 2009; Crowell 2004).

Fourth, there could be merits in joint decision making. It was a commonly held view among women that they preferred joint decision-making and control of resources, including income, as this has the potential to benefit both men and women, as described by others (Quisumbing et al. 2019), although only a few reported this was happening in their households.

Fifth, the study has shown that decision-making processes in households are 'dynamic and evolving' (Bjornlund et al. 2019). The level and degree to which decisions are made jointly is increasingly changing. Several factors explain the changes, including the market value of crops, a greater awareness of human rights, the agency inherent in the women themselves and gender divisions in labor that are becoming less rigid. However, women who defy the odds by having greater agency and venturing into men-dominated spheres of agricultural activities are seen as rebellious in the community. The labeling of women who depict signs of agency and actively participate in decision-making is not without informal negative social sanctions. In some cases, some of these women may experience violence or even divorce for not behaving and acting 'feminine' (Lawson et al. 2021; Schuler et al. 2018).

Sixth, there are shifts in the historical inclination of men on tobacco production toward the cultivation of groundnuts (Orr et al. 2016; Nuijten 2010). The shift is due to a variety of reasons, including challenges being faced in the tobacco sector (Makoka et al. 2016) and groundnuts becoming more manageable to grow and lucrative to sell than was previously the case (Chinsinga and Matita 2021). This has implications for women's access, control, and use of the proceeds from the sale of groundnuts, especially in this context where marketing is the men's domain. Similar trends have been observed in Southern Malawi among cassava-growing households (Forsythe et al. 2016) and in other countries such as Ghana, where men dominate cash crop production and their control of food crops is growing as the crop becomes more commercialized (Djurfeldt et al. 2018a, b). In other settings such as Zambia, however, women were happy that men were joining in groundnut production and providing help with labor, which was enabling them to expand production to earn more income (Orr et al. 2016).

Seventh, men predominantly interact with markets, which gives them an advantage in controlling and using realized income. Unlike in some other countries where men will only dominate the sale of some crops and leave others (usually those with less value) to women (Ankale et al. 2019), in Malawi most of the selling is dominated by men. This also points to the mobility restrictions and care responsibilities that affect women's movement (Njuki et al. 2011). FGDs revealed different expenditure patterns of agricultural proceeds, with evidence seemingly suggesting that men heads utilize money in ways that benefit them more than other members of their household. We also noted that women heads are more likely to spend money on food items compared to men heads.

Nevertheless, there were also reported improvements in welfare and livelihoods following participation in markets by households. This was evident in expenditures on children's education, health, and housing, among others. However, as noted in our earlier work, the changes in welfare are mostly temporary, and households find it difficult to sustain them to culminate into sustainable poverty escapes (Chinsinga et al. 2021). Various idiosyncratic and community-wide shocks related to climate variability, crop productivity, disease burden and functioning of marriages, among others, explain the situation. In addition, agricultural policies and strategies implemented by the government, such as liberalization, structural changes to the economy, reduced state intervention in markets, and emphasis on maize food security over other crops, interact in complex ways, affecting outcomes.

Conclusions and policy implications

This study investigates the gendered decision-making and expenditure choices of smallholder households in the context of commercialization. The findings suggest that the type of gendered decision-making regarding plot-level activities and control of income matters for commercialization and expenditure choices. Furthermore, there are gendered differences in crop commercialisation participation where households with dual adults participate more than those with women adults only or men adults only, but those with women adults only participate more in markets than those with men adults only. We further note that women are less likely to spend on farm inputs which is a critical element in producing marketable surplus. However, their expenditures are more likely to go toward health and transport. This may reflect discourse on women's expenditure pattern, where women are less interested in spending on leisure than men but are more concerned with expenditures related to household welfare, including food, children's education, and household necessities.

Both women and men recognize the role of the man as the head of the household and therefore responsible for production, marketing, and control of income. This brings out an interesting nuance to the debates on decision-making in relation to agricultural developments, as often it is assumed that because women are not the ones that make production decisions, they are dissatisfied. However, this must be traded carefully because this false consciousness could mean that women are not only in defense of their victimization but there are also enjoying it and expressing gratitude towards it. Despite women reporting preferences for joint decision-making, they lack the voice and agency to negotiate and influence decision-making outcomes. Women who are actively engaged in decision making, which is considered the domain of men, are viewed by the society as deviant. This suggests

that communities perpetuate and cement gendered perceptions about what a woman can/cannot do; hence, confronting gender norms limiting women's pursuit of opportunities should be aggressively done at the household and community-wide levels.

The findings present the following implications. First, there are differences in expenditure choices among women and men, with women spending less on assets, transport and health while men choosing to spend on assets, inputs, communication and leisure. These differences in expenditure choices point to differences in priorities. However, since expenditure decisions are dominated by men, it is unlikely that the choices of women are prioritized. Second, many decisions at the household level are preserved by men, and women seem to prefer this for purposes of intrahousehold harmony. What this entails is that women are unlikely to benefit from commercial farming endeavours in equal measure to men even if their involvement is active. Therefore, it is important that initiatives promoting commercialization should understand these dynamics and not impress on communities otherwise to avoid animosity. Furthermore, there is a need to develop programmes tailored for women that can benefit them such as empowerment programs to improve their agency and be able to engage in decision making. At household level, promote dialogue between women and men on the importance of making decisions that benefit both and reducing workload from women. For those that are heads, programs to improve their access to means of production (inputs) can be helpful. Third, the changing trends in the level and extent of women's participation in decision-making present an opportunity to strengthen women's agency – women should be supported in how they could use their social networks to bridge them to productive markets. This may mean going beyond mere targeting of women and men with commercialization ventures but coming up with tailored initiatives that could offer benefits to both women and men and not deepening inequalities. Fourth, it seems merely entrusting women with plot management decisions or that they should control income realized is not enough to achieve inclusive commercialization. There is a need to address the challenges to productivity and asset accumulation, among others, including financial management education. This study has shown that gender inequalities persist in market-based agriculture and have become engrained in many communities. The research contributes to debates that are crucial in consistently highlighting the repercussions of these inequalities so that they are addressed to ensure progress towards gender equality and secure benefits for all members of smallholder households.

Abbreviations

AISP	Agricultural Input Subsidy Programme
APRA	Agricultural Policy Research in Africa
CCI	Crop commercialization index
FGD	Focus group discussions
GoM	Government of Malawi
HH	Household
NCRSSH	National Committee for Research in Social Sciences and Humanities
NGO	Non-Governmental Organizations
NSO	National Statistical Office
SDG	Sustainable Development Goals
SOAS	School of Oriental and African Studies
TLU	Total Livestock Unit

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Author contributions
Loveness Msofi Mgalamadzi: Conceptualization; Data curation; Formal analysis; Roles/Writing—original draft. Mirriam Matita: Conceptualization; Data curation; Methodology; Formal analysis; Roles/Writing—original draft. Masausto Chimombo: Editing the manuscript.

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Availability of data and materials
The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
The study was performed with ethics approval from the National Committee for Research in Social Sciences and Humanities (NCRSSH), which is under the National Committee for Science and Technology. Individual participants were asked for consent to participate in the study. The consent forms contained clear information about the study, benefits to them and their rights as study participants. The information sheet and consent forms were written in their local language. In the event that the participants could not read, the information sheet and consent form were read to them in their language. Before the interview, they were supposed to sign if they agreed to be interviewed. Consent was also obtained to record the interview.

Consent for publication
During data collection, consent was obtained to publish results for purposes of communicating research findings. Where names have been used, they have been anonymized.

Competing interests
The authors declare no competing interests.

Author details
[1]Department of Extension, Lilongwe University of Agriculture and Natural Resources, PO Box 219, Lilongwe, Malawi. [2]Institute for Poverty, Land and Agrarian Studies, University of the Western Cape, Cape Town, South Africa. [3]Economics Department, University of Malawi, Zomba, Malawi. [4]Sophia University, Tokyo, Japan.

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