

Full Length Research Paper

Groundnut market participation in Zimbabwe: A case of Makoni District

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Groundnut production and marketing contribute substantially to food and nutrition, livestock feed, soil fertility amendment, and income diversification for the majority of poor smallholder farmers in rural Zimbabwe. However, one of the challenging issues affecting the benefits from groundnut farming continues to be the low market involvement of smallholder farmers. Research on the factors preventing smallholder farmers from effectively participating in local markets remains inadequate and inconclusive. Hence, this study examined the market participation of smallholder groundnut farmers in Zimbabwe and assessed the key factors influencing their decision to participate. A survey was conducted among 234 randomly selected smallholder groundnut farmers in the Headlands area of Makoni district, Zimbabwe. This study employed a combination of data analysis methods, comprising descriptive statistics and econometric tests. The results suggest that groundnut market participation is fairly low in Makoni District. Logit model results indicated that the decision to participate in the local groundnut market was positively influenced by membership in a farmer organization, quantity harvested, off-farm income, and access to credit. Additionally, household characteristics such as family size, gender (being female), and marital status (being divorced) had a negative relationship with the farmers' market participation decision. These findings provide insight into why smallholder groundnut farmers in Zimbabwe select themselves out of remunerative markets. To increase smallholder groundnut farmers' market participation, the government and concerned stakeholders need to focus on strengthening extension services and farmer organizations, which are key to improving smallholders' access to production information and credit facilities.

Key words: Agriculture, market participation, groundnut, logit model, Zimbabwe

INTRODUCTION

In today's changing climatic patterns and turbulent markets, groundnut – a drought-tolerant legume crop, is

increasingly grown by smallholder farmers in most parts of sub-Saharan Africa (Abady et al., 2019; Majola et al.,

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2021; Witcombe and Tiemann, 2022). In Zimbabwe, about one-tenth of the total land is under groundnuts. The crop is mainly cultivated by about 36% of the country's smallholder farmers in communal areas and resettlement areas (Tui et al., 2015), and the majority of them are subsistence farmers (Mango et al., 2018). Smallholder farmers contribute about 75% of groundnut produce in the country (Katema et al., 2017). The crop provides smallholder farmers with a range of benefits such as fixing atmospheric nitrogen in soils which in turn improves soil fertility and reduces the fertilizer needs of subsequent crops. Many smallholders use groundnuts as an intercrop or in crop rotation to fix nitrogen supply for other crops (Pasipanodya et al., 2022; Jahanshiri et al., 2022). This is particularly important given the rising prices of inorganic fertilizers, making them expensive for resource-poor smallholder farmers. Additionally, studies have shown that groundnuts have a good market demand which can help smallholder farmers to increase incomes and improve their living standards (Homann-Kee Tui et al., 2016). Yet the majority of smallholder farmers who grow groundnuts in Zimbabwe remain subsistence-oriented (Mango et al., 2018). Smallholder farmers' participation in local markets could be an effective route for rural households to escape the vicious cycle of poverty (Omiti et al., 2009; Dube, 2020). Research has identified improving market links as being essential for the successful integration of legumes into smallholder farming systems (Zamasiya et al., 2014; Mango et al., 2018). Scholars argued that the low market participation by smallholder farmers has hindered agricultural-driven economic growth and increased poverty in Zimbabwe (Cele and Mudhara, 2022). Improved market access for smallholder farmers can boost groundnut production and income significantly (Katema et al., 2017; Mahofa et al., 2022).

Consequently, smallholders' welfare and livelihoods are improved when they have access to markets, as they may sell their surpluses and buy other household needs (Boughton et al., 2007; Geremewe, 2019; Camara et al., 2023). Considering this, government institutions and the private sector in Zimbabwe have emphasized the transformation of smallholder farmers from subsistence-based farming to market-based-oriented production. The current agricultural policy is anchored on revitalizing and transforming smallholder farmers from subsistence-oriented to commercial farmers. Despite these efforts, however, the participation by smallholder farmers in groundnuts markets remains significantly very low (Hanyani-Mlambo et al., 2021; Madududu et al., 2022), and it remains unclear why some farmers choose not to participate. Much of the produce is consumed at the household level or sold at the farmgate at very low prices (Mubaiwa et al., 2018; Mango et al., 2018). Thus, there is still much uncertainty about the market participation of smallholder farmers involved in groundnut farming.

Several studies have examined the factors influencing

smallholder participation in local markets in sub-Saharan Africa Sori and Adugna, 2022. These studies indicate several factors that influence smallholder market participation, including socio-economic characteristics. Socio-economic factors such as household income, household size, distance to the market, education level, ownership of assets, and membership in farmer organizations are often found to be significant determinants of market participation among smallholder farmers (Sebatta et al., 2014; Vunyingah et al., 2021; Zondi et al., 2022; Kalauba et al., 2023). Yet, despite the importance of these findings to decision-makers, given the heterogeneity between and within countries and sectors, generalization of the findings often leads to poor policies and targeting of interventions. Empirical literature focussing on groundnut farmers in Zimbabwe is rather thin and inclusive. Only a few studies have examined smallholder farmers' participation in groundnut markets (Mango et al., 2018). This study expands this strand of literature by focusing on two objectives: (1) to investigate the market participation of smallholder groundnut farmers in Makoni District, Zimbabwe; (2) to assess the key factors influencing the farmers' decision to participate in the groundnut market.

Understanding of the key factors influencing the market participation decision is crucial when developing policies to encourage smallholder farmers' participation in groundnut markets. The results of this study will provide insight into why the smallholder groundnut farmers in Zimbabwe are self-selecting out of the remunerative markets. The implication is that increased production of groundnut in Makoni district will bring opportunities to promote smallholder income growth, reduce poverty levels and also enhance achievement of household food security in Zimbabwe.

LITERATURE REVIEW

This section reviews several previous studies that found different factors to influence smallholder farmers' decision to participate in output markets. Market participation has been positively associated with several factors such as ownership of private assets, access to credit, input use, access to extension services and off-farm income or activities (Boughton et al., 2007; Siziba et al., 2011; Omiti et al., 2009; Olwande and Mathenge, 2012; Geremewe, 2019; Hanyani-Mlambo et al., 2021; Nkegbe et al., 2023). However, these studies' findings are inconclusive, especially among smallholder farmers. While some studies have found socioeconomic characteristics such as gender, age, farm size, and marital status to have a significant relationship with farmers' market participation (Siziba et al., 2011; Boughton et al., 2007; Mango et al., 2018; Dube, 2020), other studies have only found, for instance, household size, ownership of livestock and farm size to have a negative effect on market participation

(Omiti et al., 2009; Randela et al., 2008; Olwande and Mathenge, 2012). One of the elements impacting market participation, according to transaction costs literature, is the cost of information discovery, negotiations, harvesting, and contract enforcement (Key et al., 2000; Barrett, 2008; Cazzuffi and McKay, 2012; Mmbando et al., 2015). These costs were found to be very important in influencing the decision to participate in markets. Okoye et al. (2010), found that the decision to operate as a seller or buyer were largely relying on fixed and proportional transaction costs associated with operating in the market. Goetz (1992), mentions that high fixed transaction costs prevent participation in markets. The transaction costs literature suggests that there is a strong positive relationship between low levels of transaction costs and market participation (Alene et al., 2008; Cazzuffi and McKay, 2012; Mmbando et al., 2015; Karing'u et al., 2021).

A study by Ohen et al. (2013) found that membership in farmer groups and contractual arrangements significantly influences market participation. Extension contact was also one of the factors that positively influence market participation. This means, the more the extension contact, the more the likelihood of market participation (Bardhana et al., 2012; Ohen et al., 2013; Okoye et al., 2010). According to Mpombo et al. (2022), farmers who interact with extension officers receive market information about the market requirements which improves their negotiation skills. Another factor that was found to influence market participation was the education of the household head (Mihretie, 2020). Paul et al. (2021) and Aliyi et al. (2021), found that a person's propensity for taking risks increases with education. Risk-takers will be encouraged to sell their produce on the commercial market in order to make money. According to Megerssa et al. (2020), farmers who are more educated can easily get market information which increases their chances of participating in markets. On the other hand, Haille et al. (2022) found a negative relationship between education level and market participation. They argued that farmers who are more educated can create other non-agricultural opportunities to participate in, which then reduces their chances of participating in markets. Extant literature suggests that market participation is influenced by the availability of market information, geographical location as well as distance to the market (Mihretie, 2020). Results found by Randela et al. (2008), and Onoja et al. (2013) showed that distance to the market negatively affects market participation. Oparinde and Daramola (2014), state that geographical location also affects the decision to operate in the market. The availability of market information has an impact on market involvement as well since it allows farmers to find out where their goods are in high demand and where they may sell them for higher prices (Jagwe et al., 2010).

Studies that focused on socioeconomic characteristics suggest that the age of the household head, gender and

asset ownership influence market participation (Barrett, 2008; Mihretie, 2020; Pasipanodya et al., 2022). According to Okoye et al. (2010), the older the household head, the more likely they are to participate in the market. Oparinde and Daramola (2014) and Ma-Azu et al. (2022) found similar results where the age of the household positively affected market participation. Older farmers are more likely to have a long-term relationship with their customers, have better access to credit or loans, possess their own land, and have enough labor due to bigger families, increasing their chances of participating in markets. Studies by Sigel et al. (2014) and Mergessa et al. (2020) found conflicting results in which age had a negative relationship with the decision to participate in the markets. This indicates that younger farmers were participating in markets more than older farmers. According to Sigei et al. (2014), young farmers are more enthusiastic and tend to have longer planning horizons which motivates them to participate in the output markets.

According to Jagwe et al. (2010), gender influences market participation. Based on their results, females were negatively affected by transaction costs and other costs for searching for buyers as compared to males. As a result, female farmers faced more hindrances in market participation. A study by Zamasiya et al. (2014) found conflicting results where females participated more in soybean markets than males. This is mainly because legume crops such as groundnuts and soybean are dominated by women in Zimbabwe (Zamasiya et al., 2014; Pasipanodya et al., 2022). Oparinde and Daramola (2014) also found the decision to participate in marketing to be affected by the volume of production. Ownership of assets such as livestock, land, equipment and labor influences market participation. Barrett (2008) and Green et al. (2006), state that people with enough assets may have incentives that enable them to participate more in the market compared to those without enough assets. The land size was also found to influence market participation (Ohen et al., 2013; Randela et al., 2008; and Oparinde and Daramola, 2014). A study by Ismaili (2022) also investigated the influence of psychological contracts on market participation. The regression results from their study showed a positive relationship between market participation and transactional, ideological as well as relational contracts.

RESEARCH METHODOLOGY

Description of study area

Makoni is a district located in Manicaland Province, in northeastern Zimbabwe with an estimated population of 288 444 in 2022 (Zimstat, 2022). The district is located approximately 170 kilometers, by road, southeast of Harare the capital city of Zimbabwe. It is found in the natural farming region 2 which is mainly characterized by intensive crop and livestock farming systems, receiving an average rainfall of 700 to 1050mm per year and is subject to either more severe dry spells or the occurrence of a

relatively short rainy season (Murashiki et al., 2017; Dube and Mugwagwa; 2017). According to Dube et al. (2015), Makoni district is primarily a farming district with the chief crop being tobacco and a large number of smallholder farmers in the area are involved in groundnut.

Research design, data collection and analysis

The study used descriptive research design to examine the characteristics of those farmers participating in groundnut markets and those not participating in the markets in Headlands, Makoni District. According to Dulock (1993) and Sileyew (2019), descriptive research accurately captures the characteristics of the individuals, groups, or circumstances as well as the association among variables making use of statistical measures such as mean, percentage, standard deviation, tabulation, and frequency distribution. A cross-sectional research design was then applied to assess the relationship between smallholder farmers' decision to participate in the groundnut market and various socio-economic variables. The primary data was gathered using a structured questionnaire administered by trained enumerators. The questionnaire was designed to collect information on groundnut production as well as various farmer socio-economic and household characteristics such as age, gender, farm experience, family size, and marital status of the household, off-farm income, access to credit, extension contact and access to market information.

The target population for the study was farmers who cultivated at most 2 hectares of groundnut in the 2021-2022 production seasons. The research employed a multi-stage sampling technique, with the first stage consisting of the intentional selection of the Headlands area, and the second stage consisting of the purposive selection of 3 wards based on the number of smallholder farmers growing groundnut. In the third stage, simple random sampling was used to select 80 households from each of the 3 wards within the Headlands area. The simple random sampling technique was preferred because of its lack of bias as it ensures that every individual within the target population has an equal chance of being selected in the sample. Six questionnaires from one of the wards were disregarded, therefore, a sample of 234 smallholder groundnut farmers was used for the study.

Analytical model

A logit model or logistic regression model is commonly used in regression analysis involving a binary dependent variable, i.e., one for yes and zero for no (Gujarati, 2004; Wooldridge, 2009). Several studies have employed the logit model to analyze data involving binary results or choices (Randela et al., 2008; Onoja et al., 2013; Agrawal et al., 2022; Nyakatonje and Jambo, 2023). According to Wooldridge (2009), the logit model is preferable because it avoids the possibility that a prediction of the dependent variable might be outside the probability interval of 0 to 1. The logit model was used in this study to analyze the farmers' characteristics that were associated with the decision to participate in the groundnut market. The dependent variable takes a value of 1 if the farmer participated in the market and a value of zero if the farmer did not participate in the groundnut market. According to Gujarati (2004:597) and Kgosikoma and Malope (2016), theoretically, the logit model can be expressed in terms of log ratio as indicated in equation 1.

$$L_i = \ln \left[\frac{P_i}{1-P_i} \right] = \beta_0 + \beta_i X_i + \mu_i \quad (1)$$

Where L is referred to as the Logit; indicating the log of the odds ratio (Gujarati, 2004)

P_i is the probability that the farmer will decide to participate in the market.

$1 - P_i$ is the probability that the farmer will decide not to participate. X_i are the various socio-economic factors that will be considered in this study

β_0 is a constant term

μ_i is the error term

β_i is the regression co-efficient measuring the change in L for a unit change in X_i .

The specific theoretical relationship between the Market Participation Decision (MPD) and various independent variables is shown below.

$$MPD = F(\text{age, gender, household size, farming experience, area under groundnut, membership in an organization, off-farm income, access to credit}) \quad (2)$$

Using the previous theoretical relationship in equation 1, the following logit model was estimated using the Stata Software Package (Gujarati, 2004; Greene. 2012).

$$\ln \left[\frac{P_i}{1-P_i} \right] = \beta_0 + \beta_1 \text{age} + \beta_2 \text{gender} + \beta_3 \text{maritalstatus} + \beta_4 \text{familysize} + \beta_5 \text{experience} + \beta_6 \text{membership} + \beta_7 \text{areacultivated} + \beta_8 \text{offfarmincome} + \beta_9 \text{quantityharvested} + \beta_{10} \text{accesstocredit} + \mu \quad (3)$$

Justification of variables

Table 1 provides a description of the variables considered in the study. The independent variables indicated in Equation 3 are defined and their expected relationship with the dependent variable of market participation is given. The dependent variable (MPD) is a binary variable showing the decision to participate or not participate in the market.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents related to market participation

The respondents were categorized into those who participated in markets and those who did not participate. Table 2 indicates that, out of the 234 respondents, 113 farmers did not participate in the market whilst 121 farmers participated in the market. The level of market participation of smallholder groundnut farmers in the study area is 51.71% as shown in Table 2. Therefore, groundnut market participation is fairly low in Headlands, Makoni District. A chi-square test is used when analyzing the correlation between two categorical variables (Ugoni and Walker, 1995). The chi-square test was employed in this study to examine whether there was a relationship between the various respondent characteristics and their decision to participate in the market. Only those chi-square test findings that showed a statistically significant correlation between the categorical variables under consideration are explained in the study. The chi-square test shows a significant association between market participation and membership in a farmer organization

Table 1. Description of independent variables and expected signs.

Variable	Description	Measurement	Expected sign
Age	Age of household head	Number of years	+/-
Gen	Gender of household head	Dummy: 1 = male, 0 = otherwise	+
Marst	Marital status of the farmer	0 = single, 1 = married, 2 = divorced, 3 = widowed	+
Hhsize	Household size of the farmer	Number of people in the household	+/-
Fexpe	Farmer experience in growing groundnuts	Number of years in farming	+
Memb	Membership of farmer to an Association	Dummy: 1 = member, 0 = otherwise	+
Areaundergrn u	The total amount of land cultivated for groundnuts in the 2021 production season	Number of hectares	+
Offinc	Off-farm income	USD	+/-
Quantityharv	The total output of groundnuts produced in the 2021 production season	Kilograms	+
Accesscredit	Access to credit by farmer	Dummy: 1 = farmer received credit 0 = otherwise	+

Source: Field Survey (2022).

Table 2. The level of market participation.

Market Participation	Frequency	Percentage
No	113	48.29
Yes	121	51.71
Total	234	100.00

Source: Field Survey (2022).

Table 3. Association between market participation and education level.

Market Participation	Farmer organization member		
	Yes	No	Total
No	56	57	113
Yes	80	41	121
Total	136	98	234

Chi-square value = 6.5817 p. value. 0.010.

Source: Field Survey (2022).

(p.value = 0.010). As indicated in Table 3, the majority of those who participated in the groundnut market (80) belonged to a farmer organization. Among those who were not members of an organization, 41 participated in the market whilst 57 did not participate. Table 4 shows that there is a significant association between market participation and the gender of the household head. The results indicate that, out of the 130 respondents who participated in the market, 83 of them were males whilst 47 were females. The majority of the male respondents participated in the market and on the other hand, the majority of the female respondents did not participate in the market (Table 4).

The results in Table 5 indicate that there is a significant

association between market participation and access to credit. The majority of the farmers who did not participate in the market had access to credit (58) whilst 55 farmers did not receive any credit (Table 5). Among the farmers who participated in the market, the number of those who received credit (62) was more than the number of those who did not receive credit (59). The results of the chi-square test show a significant association between market participation and marital status (p. value = 0.000). The respondents in the study consisted of 10 single farmers, 14 divorced farmers, 29 widowed farmers and 181 married farmers who were the majority. Table 6 indicates that most of the single (7) and widowed (26) farmers participated in the market whilst most of the

Table 4. Association between market participation and gender.

Market participation	Gender		Total
	Male	Female	
No	67	46	113
Yes	63	58	121
Total	130	104	234

Chi-square value = 8.1424 p. value. 0.004.

Source: Field Survey (2022).

Table 5. Association between market participation and access to credit.

Market participation	Access to Credit		Total
	No	Yes	
No	55	58	113
Yes	59	62	121
Total	114	120	234

Chi-square value = 28.3293 p. value 0.000.

Source: Field Survey (2022).

Table 6. Association between market participation and marital status.

Market participation	Marital status				Total
	Single	Married	Divorced	Widow	
No	3	100	7	3	113
Yes	7	81	7	26	121
Total	10	181	14	29	234

Chi-square value =21.6876 p. value 0.000.

Source: Field Survey (2022).

married farmers (100) did not participate in the market.

The mean difference between groundnut market participants and non-participants was compared using an independent t-test (Table 7). It was found that there is a significant mean difference between participants and non-participants in age, quantity harvested, and groundnut land size in hectares at a 1% significance level. This implies that groundnut market participants are older farmers who produce larger quantities of groundnuts and who have a fairly larger cultivated land on groundnut when compared to non-participants. Additionally, there was a significant mean difference between participants and non-participants by distance to the market at a 5% significance level. The average distance to the market for market participants is 29.18519km which is less than the distance to the market for non-participants.

Table 8 shows the marginal effects associated with the factors influencing the market participation decision. According to Wang et al. (2021), marginal effects explain the changes that occur in a dependent variable in response to changes in independent variables and can

be expressed as either a derivative or elasticity. Table 8 indicates that four variables including quantity harvested, off-farm income, access to credit and member of an organization had a positive relationship with the market participation decision. On the other hand, the market participation decision had a negative relationship with variables such as gender, marital status (being divorced) and family size. The study found an insignificant relationship between the farmer's decision to participate in the market and age, being married, being widowed, farming experience, as well as the size of land allocated to groundnut.

Factors influencing the market participation of groundnut farmers

Table 8 shows a negative relationship between gender (female) and market participation decision at a 5% significant level (p. value = 0.036). As indicated by the marginal effect value of -0.11545, compared to males,

Table 7. Mean comparisons between market participants and non-participants.

Variable	Market participant	Non- participant	Mean difference	Std error	t-value
Age (years)	43.83471	37.68142	-6.153295	1.846555	-3.3323***
Family size	6.966942	6.442478	-0.5244643	0.35096	-1.4944
Groundnut land size (ha)	1.740179	1.225664	-0.5145149	0.102492	-5.020***
Distance to market (km)	29.18519	32.26531	3.080121	1.566134	1.9667*
Quantity harvested in 50 kg bags	19.05785	14.40816	-4.649688	1.149529	-4.0449***

Source: Field Survey (2022).

Table 8. Factors influencing market participation decision of groundnut farmers.

Variable	dy/dx	Std. Err.	z	P>z	95% Interval	Confidence
Age	0.004621	0.003134	1.47	0.140	-0.00152	0.010763
Gender						
Female	-0.11545	0.055189	-2.09	0.036**	-0.22362	-0.00729
Marital status						
Married	-0.16255	0.121102	-1.34	0.180	-0.39991	0.074805
Divorced	-0.29906	0.144608	-2.07	0.039**	-0.58248	-0.01563
Widow	0.032973	0.162223	0.2	0.839	-0.28498	0.350924
Family size	-0.02164	0.012793	-1.69	0.091*	-0.04671	0.003432
Years of growing groundnut	0.001948	0.006383	0.31	0.760	-0.01056	0.014459
Farmer organization						
Yes	0.170861	0.066631	2.56	0.001***	0.040266	0.301455
Area under groundnuts	0.012576	0.034667	0.36	0.717	-0.05537	0.080523
Quantity harvested	0.019938	0.00301	6.62	0.000***	0.014038	0.025838
Off-farm income	0.000281	0.000137	2.05	0.004***	1.27E-05	0.00055
Access to credit						
Yes	0.249386	0.062215	4.01	0.000***	0.127447	0.371325

***, **, and * at 1, 5, and 10% LOS respectively
Source: Field Survey (2022).

being a female farmer is associated with 11.5% decrease in the probability of participating in the groundnut market, *ceteris paribus*. This is because in most cases female farmers have too many responsibilities such as child care which diverts their focus from farming; therefore, they end up not producing enough to sell on the market. The results of this study are similar to the findings by Yaméogo et al. (2018), who found that female farmers were less likely to participate in the market than their male counterparts. A study by Asamu et al. (2020) revealed that gender inequality of women in agricultural activities significantly impacts their performance in farming which in turn affects their participation in the market. The results indicate that off-farm income has a positive influence on market participation and it is significant at 1% ($p=0.04$). The marginal effect for the impact of off-farm income on market participation

decision is 0.000281 as shown in Table 8. This means that an increase in off-farm income by 1 USD will increase the probability of smallholder farmers participating in output markets for groundnuts by 0.03%, *ceteris paribus*. This is because farmers with off-farm income can invest that money in their farming business which increases their groundnut output; hence they can sell some of their produce on the market. The result is contrary to the studies by Rubhara and Mudhara (2019) and Abebe and Debebe (2020), who found off-farm income to be negatively related to market participation. However, a study by Nkegbe et al. (2023) found similar results to this study where non-farming activities enhanced the market participation of farmers in Ghana.

According to the results in Table 8 being in any farmers' organization has a positive and significant influence on market participation at a 1% level (p . value =

0.001). The marginal effect on farmer organizations is 0.170861 meaning that, compared to those who do not belong to any organization, being part of any farmers' organization is associated with a 17.1% increase in the probability of participating in groundnut markets, *ceteris paribus*. Farmers who belong to farming organizations gain crucial skills and knowledge which improves their production leaving them with enough to sell on the market. This result is consistent with the findings of Musah et al. (2014) and Mmbando et al. (2015). According to Aku et al. (2018), the involvement of smallholder farmers in farmer organizations promotes their market participation by giving them better access to market information on pricing, quality, quantities, where to sell, and production technology.

According to the results of this study, the quantity of groundnut harvested is statistically significant at 1% and has a positive influence on the probability of groundnut market participation. The marginal effect associated with the quantity harvested is 0.019938 as indicated in Table 8. This implies that an increase in the quantity harvested of groundnuts by one 50kg bag increases the probability of groundnut market participation by 1.99%, holding other factors constant. This is because having more groundnut output leaves the farmer with enough surpluses to sell on the market. The results are consistent with the findings of Musah et al. (2014), who also indicated that a high amount of yield can motivate farmers to participate in the groundnut market. However, Abebe and Debebe (2020) as well as Haile et al. (2022) found different results where the increased volume of output caused low participation in the market.

Family size has a negative and significant relationship with the farmer's decision to participate in the groundnut market at a 10% level. Table 8 shows the marginal effect under the family size variable being -0.02164. This means that an increase in family size by one household member is associated with a 2.1% decrease in the probability of participating in the groundnut market. This is because an increase in the number of people in the family results in more groundnut produce required for consumption leaving the farmer without any marketable surplus, thus, a decrease in the farmer's participation in the market. Studies by Siziba et al. (2011) and Kyaw et al (2018) found similar results where households with larger family sizes remained with fewer or no agricultural produce to sell on the market. On the other hand, a study by Zamasiya et al. (2014) found an insignificant relationship between family size and farmers' participation in the market. The results in Table 8 show that the relationship between the market participation decision and access to credit is positive and statistically significant at a 1% level. The marginal effect on the access to credit variable is 0.2493. This implies that, compared to those without access to credit, having access to credit increases the probability of participating in output markets of groundnut by 24.93%, *ceteris paribus*. This is because

when credit is easily accessible, farmers adopt cutting-edge technology, which boosts their market participation (Mariyono, 2019). This result is in line with Shewaye et al. (2016), Ma-Azu et al. (2022) and Haile et al. (2022) who found that access to credit positively affected market participation.

Table 8 indicates that marital status under the divorced category has a negative impact on smallholder market participation at a 5% significant level. The marginal effect of being divorced is -0.29906, meaning that, compared to those who were never married, being divorced is associated with a 29.9% decrease in the probability of participating in the groundnut markets, *ceteris paribus*. This might be because the farmer will be left with more responsibilities which might limit their production of groundnuts. In a study on market participation of smallholder maize farmers in the upper west region of Ghana, Musah et al. (2014) found an insignificant relationship between marital status and market participation.

Conclusion

This study investigated the market participation of smallholder groundnut farmers in the Makoni district and assessed the key factors that influence their market participation decision. The study concludes that there is fairly low market participation by groundnut farmers in Makoni District. The chi-square tests showed a significant association between market participation and farmer organization membership, gender, access to credit as well as marital status. The study concludes factors such as gender, marital status and family size negatively influence the market participation decision of the farmer, while factors including membership in a farmer organization, quantity harvested, off-farm income, and access to credit positively influence the farmer's decision to participate.

Recommendations

To address the gender discrimination against women, which is preventing them from participating in markets, the study recommends policy reforms promoting gender equality, raising awareness campaigns, facilitating access to resources for female farmers, as well as offering training and capacity building to women in agriculture. The study also recommends the strengthening of farmer organizations, thereby taking advantage of the services, skills and training offered to farmers on productivity-enhancing measures. This will improve smallholders' access to marketing information and credit, enhance their production and enable them able to participate in output markets for groundnuts. The government is encouraged to help smallholder farmers

through partnerships with agro-businesses and non-government organizations in an attempt to improve the market participation of groundnut farmers in Zimbabwe.

CONFLICT OF INTERESTS

The authors have not declared any conflicts of interests

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