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Evaluating Market Participation of Resource-constrained Smallholder Farmers in Eastern Cape Province, South Africa

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ABSTRACT Linking rural smallholder farmers to mainstream markets remains a challenge for South Africa, despite favourable policies and funding opportunities. This is a quantitative research design evaluating the challenges and possible complementarities associated with farmers' market participation in the former homelands of the Eastern Cape Province. A structured questionnaire was developed and administered to the purposively selected sample of 210 smallholder farmers. Data were analysed using a probit regression model. The findings revealed the important role that farmer characteristics play in market participation. Most notably, results revealed that if farming is left in the hands of elderly people who lack the physical ability to perform the manual tasks that characterise the system, it results in a slow transition into market-oriented agriculture. This calls for strategies to improve farm methods with technological advancements that are either age-friendly or attract young people into farming.

INTRODUCTION

Market participation remains a key mechanism for escaping from abject poverty for rural smallholder farmers in the light of its high potential to significantly increase incomes and provide rural smallholders with sustainable livelihoods (Kyaw et al. 2018). Smallholder farmers' market participation entails a transition from subsistence farming systems to systems in which they have an opportunity to derive benefits beyond subsistence production (Fan and Rue 2020). However, without well-functioning markets and an enabling environment, remunerative market participation of smallholders is not possible. Research shows that meaningful market access and participation is not only critical for smallholder farmers' integration into the mainstream economy, but can also have a multiplier effect on their overall well-being, including rural development.

South Africa has approximately 2 million black farmers who are largely survivalists. These are subsistence farmers with limited productive resources, producing just a small proportion of their food needs and obtaining the rest from markets (Khoza et al. 2019). Given their limited resources, these farmers struggle to ensure that they are food secure while also securing the necessary revenue to meet their societal obligations (Obi and Ayodeji 2020; Gobena 2016). Subsistence-level living needs considerably more than just food sufficiency with income to meet both economic and social demands. As a result, smallholders should explore options with possibilities for income generation (Lesala 2021). However, options available to rural smallholder farmers are limited (Liu et al. 2018). Agricultural markets in South Africa are saturated with large-scale farmers, who account for over eight percent of the value of agricultural production (Wegerif 2022) and supply up to ninety-five percent of the output marketed through formal channels (Swanby and Black 2017), compelling smallholder farmers to sell through channels with little or no prospects for profitability. Hence smallholder farmers continue to live on subsistence (Mdoda and Obi 2019).

Prioritising market access is unquestionably critical for sector development and smallholder development. The South African government's goal has in the past and continues to be to strive in integrating the majority of impoverished black subsistence farmers into the mainstream economy. For instance, focus has been on how several 'market deregulation' and 'trade liberalisation' policies have

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been implemented, not only to achieve social justice and transform small-scale farming, but also to connect farmers to agricultural markets and turn them into profitable agribusinesses (Nxumalo et al. 2019). Deliberate efforts have been made, at least since the later years after the Apartheid Era, to integrate the black population into the nation's agricultural economy. These efforts have included institutional reforms that entailed changes in land ownership and other farming resources as well as farm organisation. At the same time, the funding to agriculture has expanded considerably to finance a comprehensive land reform programme and a wide range of complimentary programmes designed to enhance the effectiveness of the land reform programme. However, two decades later, all measures taken have resulted in little or no improvement of rural smallholder producers, whose conditions have either stagnated or worsened (Khoza et al. 2019).

Despite numerous interventions, market access has been, and continues to be, a challenge for smallholder farmers, including those who practice irrigation farming in the Eastern Cape Province. As it stands, de-agrarianisation is already taking place in most parts of the Province as many smallholder farmers are shifting to cultivation of food plots and home gardens (Mujuru and Obi 2020). The output of the smallholders has been on the decline and marketable surplus remains limited. Many rural households face low incomes owing to a rural economy that is not robust enough to provide remunerative jobs or prospects for self-employment (Mujuru and Obi 2020). This shows disparities in government initiatives that despite efforts, do not correspond to outcomes in smallholder production and livelihoods.

Evidently, much work needs to be done in identifying the appropriate interventions and the real reasons why farm output continues on a downward trajectory. The challenge for policymakers, however, is determining which key factors to target and prioritise in order to develop appropriate measures that address the actual problems of smallholders. A thorough and urgent examination is therefore required to establish the actual challenges and potential opportunities for improvements in smallholder market access and participation. This will assist policymakers in designing and implementing policies with appropriate interventions that have direct and greater payoffs.

Objectives

The main objective of this paper was to examine the market participation of smallholders to identify the challenges and the complementarities associated with their participation in markets. Specifically, the paper examined the socioeconomic characteristics of smallholder farmers, determined the market participation among the smallholder farmers, and identified the factors influencing their market participation.

MATERIAL AND METHODS

Study Design

This is a cross-sectional quantitative study examining small-scale irrigation farmers in the homelands of the Eastern Cape Province, previously known as Transkei and Ciskei regions. These former homelands are hosts to a number of government-supported small-scale irrigation schemes, which were integrated under the rehabilitation programmes with the aim of improving food security and fighting the widespread poverty (Avuletey 2017). About eight (8) small-scale irrigation schemes, namely, Hertzog, Horseshoe, Keiskamahoek, Ncora, Shiloh, Qamata, Zanyokwe, and Teyfu Irrigation Schemes were implemented within these communities (Kibirige 2013). Figure 1 shows the small-scale irrigation schemes in the homelands of the Eastern Cape Province.

Sampling

The multi-stage sampling procedure was used for selecting the sample. In the first stage, the three small-scale schemes, the Qamata irrigation scheme in Transkei, the Zanyokwe and Tyefu irrigation schemes in Ciskei, were selected. The Qamata, Zanyokwe and Tyefu irrigation schemes were selected purposely because among the irrigation schemes managed at small-scale in the study area, they were considered as the largest and most operational irrigation schemes while many other schemes have been abandoned (Fakunle and Akeem 2017). The second stage involved the random selection of the respondents. The respondents who were the household's heads or those making the agricultural and market decisions were selected and depending on their availability for

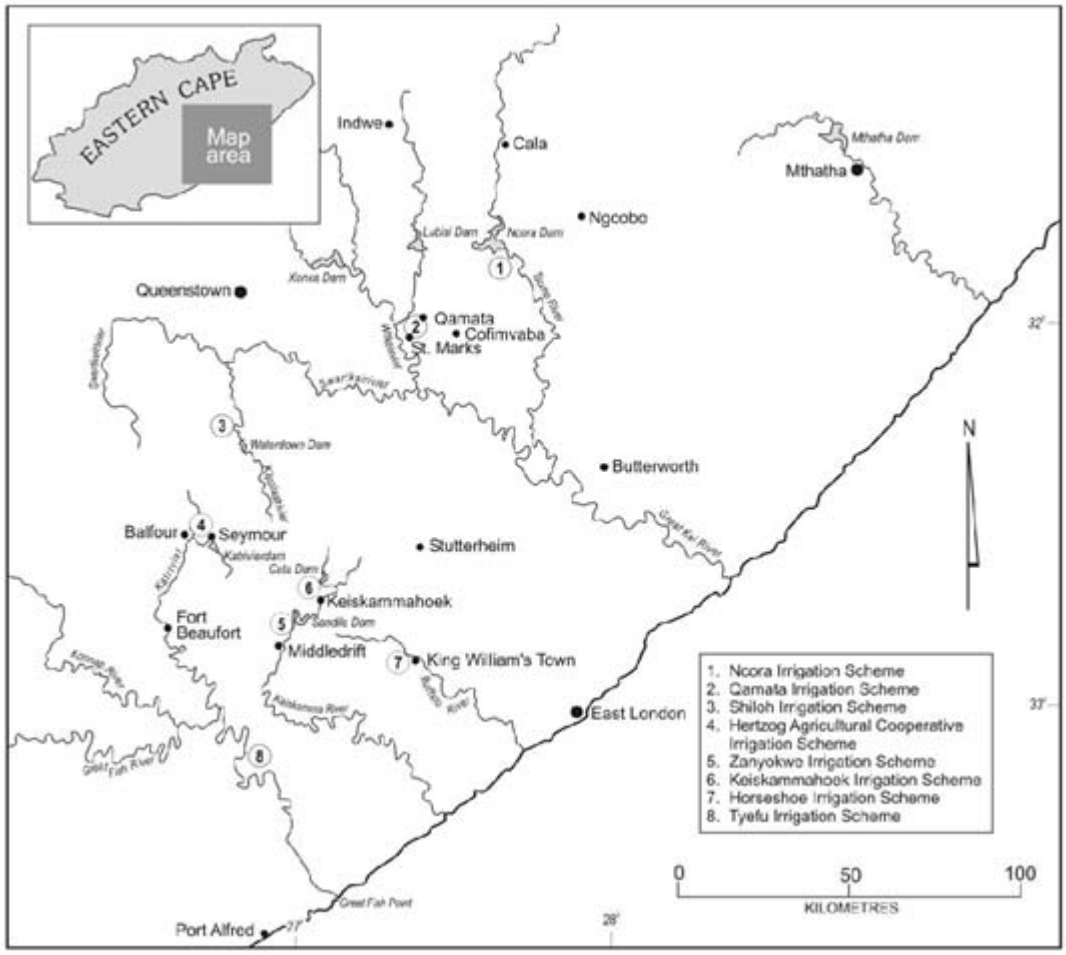

Fig. 1. Irrigation Schemes in the Eastern Cape Province (ECSECC 2017)

the interviews, a sample of 210 irrigators were interviewed.

Data Collection Method

A structured questionnaire and face-to-face interviews were used to collect data. The questionnaire was pre-tested in Melani Village in the local IsiXhosa language, which has agricultural activity similar to the study sites and is about 10 kilometres from the University of Fort Hare, before it was administered. This was done to see if the questionnaire addressed all of the objectives, if the questions were clear and easy to understand, and if there were any ambiguous or biased questions, as well as to give the researcher a chance to identify and correct errors or delete unwanted questions. Following questionnaire testing, the questionnaires were revised and modified to fit the required data. The actual field survey was conducted with one visit per respondent, who were chosen using the procedures outlined in the preceding sections.

Data Analysis

The descriptive and econometric statistical tools were used to analyse data. The descriptive analysis

utilised the mean, frequency, percentages and standard deviations to analyse the demographic and socio-economic characteristics of farmers. The econometric analysis applied the probit model to estimate market participation decisions and determine the factors affecting farmers' decision to participate in markets.

Theoretical Framework and Specification of the Market Participation Model

The agricultural household model assumes that a farmer is a producer and consumer who is indifferent between profit and utility maximisation (Singh et al. 1986). The model implies that profit can only be maximised if the quantity demanded for home consumption is assured (Kahan 2013). This means that even if the farmers sell their produce, the dominant portion of production is reserved for home use (Mignouna et al. 2015). In this case, the households' motive for participation in the output market is to maximise a utility function that yields the highest returns from participation.

The utility function can be expressed as:

$$U_i = U_i\,(y_i, z_i, p_o, \mu_i) \tag{1}$$

Where, *yi*, refers to the farmer's income, *Zi* is a vector of the farmer's socio-economic characteristics and attributes of choice, is a vector for non-participation and is the stochastic error term representing other unobserved utility components. The farmer would then decide whether to participate in markets based on the following conditions:

$$U_i = U_i\,(y_i - P_i, z_i, \mu_i) \geq U_o\,(y_i - z_i,\ \mu_i) > \tag{2}$$

That is, the farmer decides to participate if and only if the returns and utility level of satisfaction from market participation exceed the expected level of satisfaction or return from not participating in markets with the alternatives, such as, being autarkic after weighing all of the options. In the nature of things, the differences in the utilities cannot be directly observed. What is observed, however, is the decision taken by the individual. A linear expression of the utility can be represented as:

$$\begin{matrix} Y^a_i\ \beta_1\,(X_{i1}) + \varepsilon_{i1} \\ Y^n_i\ \beta_n\,(X_{in}) + \varepsilon_{in} \end{matrix} \tag{3}$$

Where the X_{in} represents the equation's exogenous explanatory variables, Y^a_i is the utility associated with market participation, Y^n_i is the utility of a non-market participant, and in ε_{in} are random disturbance terms for the population of buyer, seller, and autarkic households. The farmers' decision to participate in output markets can therefore be expressed as follows:

$$\begin{matrix} y_i = 1\ if\ y^*_i > 0 \text{ and } 0 \text{ if } y^*_i \leq 0 \\ y^* = x'_i\ a + \varepsilon_i \end{matrix} \tag{4}$$

Where, y^*_i is a latent variable that takes the value of 1 if a household participates and 0 otherwise, x is a vector of household characteristics, and ε is the normally distributed error term. In investigating the probability of participating in the output market, it is assumed that an underlying response variable exists that captures the actual socioeconomic status of farmers. In this case, the underlying response variable M^*_i, following Greene (2003), is defined by the regression equation:

$$MP^*_i = \Sigma x'_i\ \beta + \varepsilon'_i \tag{5}$$

In equation (5), MP^*_i is not observable, as it is a latent variable. What is observable is an event represented by a dummy variable DD defined by:

$$MP_i = \{1\},\ if\ M^* > 0\ else\ MP_i = \{0\} \tag{6}$$

From equation (6), the following expression can be deduced:

$$Prob\,(MP_i = 1) = Prob\,(\mu_i > -\Sigma x'_i\beta) = 1\text{-}F(-\Sigma x'_i\ \beta)$$

and

$$Prob\,(MP_i = 0 |\ \beta x'_i) = F(-\Sigma\ x'_i\ \beta) \tag{7}$$

Where F is the cumulative distribution function of μ_i. The observed values of MP are the realisation of the binomial with probability given by equation (7), which varies with x'_i. Thus, the likelihood function can be written as:

$$L = \prod_{DD_i=0} F\,[(-\Sigma x'_i\beta)]\ \prod_{DD_i=1}\,[1 - F\,(-\Sigma x'_i)] \tag{8}$$

Equation (8) can also be written as;

$$L = \prod_{DD_i=1} F\,[(-\Sigma x'_i\beta)]^{1\text{-}DD'1}\,[1 - F\,(-\Sigma x'_i)]^{DD1} \tag{9}$$

The log likelihood function for the equations (8) and (9) can be written as:

$$L = (\beta) = Log\,L(\beta) = \sum_{i=0}^{n} DD_i\,Log\,(1\text{-}F\,(-\beta x'_i\,\beta) +$$
$$(1 - DD_i)\,Log\,F\,(1\text{-}\Sigma x'_i\,\beta\,) \tag{10}$$

The functional form imposed on F in equation (10) depends on the assumption made about the error term (ui) in equation (7). The cumulative normal distribution and logistics distribution are quite similar, yielding the same result. In this study, a probit model with the assumption of logistic cumulative distribution function of U in F (in equations 8 and 9) is specified as:

$$1 - F\,(-\Sigma x'_i \beta) = \frac{e\Sigma x'_i \beta}{1 + e\Sigma x'_i \beta} \quad (11)$$

$$(-\Sigma x'_i \beta) = \frac{e\Sigma x'_i \beta}{1 + e\Sigma x'_i \beta} = \frac{1}{1 - e\Sigma x'_i \beta} \quad (12)$$

Where, β is the vector parameters that reflect the effect of a change in x on probability of being food insecure. The choice of a particular form for the right hand side of the equation (11) leads to an empirical model. Adopting the Probit analysis, the probability that a household would participate in output market is given by the regression model:

$$Prob\,(MP = 1) = \frac{e\,(x'_i \beta)}{1 + e(x'_i \beta)} \quad (13)$$

Equation (8) is a logistic cumulative distribution function where:

$$B' X = \beta_0 + \Sigma\ \beta_i X_i + \mu_i \quad (14)$$

Where, μ = base of natural logarithm, β_0 = the constant term, β_1 = the vector of coefficients, and X_i = vectors of explanatory variables. Then, the market participation model for estimation is stated as follows:

$$MP_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2\,\mu + \beta_{11} X_{11} + \varepsilon \quad (15$$

Where, MP_i i is a vector for the dependent variable, market participation, X_i is a vector for the explanatory variables, β_0 is a constant, $\beta_1 \ldots \beta_{11}$ are the coefficients for estimation, and e is the normally distributed error term. The explanatory variables are demographic and socioeconomic characteristics of the smallholder farmers, namely, gender, age, marital status, education, and main occupation of the household head and the household size, production and market factors such as cultivated farm size, distance to market, and extension service support, and institutional factors such as financial support and farmer organisation status. The description of variables and the hypothesised outcomes is presented in Table 1.

RESULTS

Socioeconomic Characteristics of Farmers (n = 210)

Based on the data, the sampled respondents were mostly male farmers (n = 129, 61%) as compared to (n = 81, 39%) female farmers. The most observed age group was 61 years old (n = 107, 51%), while only (n = 17, 8%) comprised farmers between the ages of 21 and 40 years. This implies that the majority of the farmers in these communities are older than younger farmers. The emerging results further indicated that a majority of farmers who participated in the study were not married (n = 138, 66%). Further to this, most of the respondents (n = 85, 40%) lived in households of at least three (3) people. However, the average size of a household in the Qamata, Zanyokwe and Tyefu areas was five (5) members per household.

The data also showed that the most attained level of education among the farmers was secondary level of education (n = 114, 54%), which implies farmers are able to read and write and at least understand the basic information relating to agricultural production and markets. Results emerging from the collected data showed that crop farming was the primary economic activity for the majority of farmers (n = 149, 71%). In terms of remittances it could be deduced that they contributed more to household income, (3445.5 ZAR and the equivalent of 214.44 USD) than farm income and social grant, although most households (n = 204, 97%) received a social grant.

Findings also revealed that the majority of farmers (n = 111, 53%) were cultivating less than 1.25ha, and were situated (n = 189, 90%) about 10 km from their farm areas to markets. This suggests that most of the farmers had no direct link with formal markets such as supermarkets and agro-processors, and as such most of their sales were either made at the farm gate or within their communities (Khapayi and Celliers 2016). On the other hand, results highlighted that on average, farmers in the study area travel about 23 kilometres to their nearest market area in the closest towns namely, Cofimvaba, Peddie and Alice, where the market is typically Spar and Boxer's supermarket. A majority (n = 154, 73%) of the farmers had received farm support from the government. Finally, the majority of farmers observed

Table 1: Definition of variable and their hypothesised outcome

Variable	*Description*	*Hypothesised outcome*
MP	Market participation coded 1 if yes, 0 otherwise	
Gender	1 if male, otherwise 0	+/-
Age	Number of years	+/-
Age Squared[1]	A quadratic term for capturing the varying effect of age	+/-
Marital Status	1 if married, 0 otherwise	+/-
Household Size	Number of people living in a household	+/-
Education	Highest level of education	+/-
Main Occupation	1 if farming is primary occupation, otherwise 0	+
Cultivated Farm Size	Area cultivated in acres	+
Distance to Market	Nearest market in kilometres	+/-
Extension Service	1 if received extension service, 0 otherwise	+
Financial Support	1 if received government financial support, 0 otherwise	+
Farmer Organisation	1 if member in farmer organisations, 0 otherwise	+

[1] A quadratic term used to accurately the varying effect of age, which may have a non-linear relationship with the market participation decision of smallholder farmers

(n = 139, 66.2%) belonged to cooperatives or farm associations. The aforementioned percentages of the farmer's attributes are shown in Table 2.

Mean Statistics of Farmers' Characteristics and Market Participation (n = 210)

On examining the market participation of selected farmers, the data in Table 3 revealed that n = 164 or seventy-eight percent, with a standard deviation (SD = 5.383), participated in output markets. The results also revealed that farmers who participated in markets were at the average age of 61 years (SD = 4.209) and the non-market participants were at the average age of 62 years. The average household size of market participants was 5 persons per a household compared to 4 persons in the households of non-market participants. On average, two percent (SD = 0.138) of the respondents were married regardless of whether they participated in markets or not. It can also be observed that household heads whose primary occupation was agriculture participated more (at least 7%, SD = 0. 483) in markets than those who depended on other activities for their living (at least 5%, SD = 0. 345). The average income for market participants was 8,676 ZAR with SD = 598.7 compared to the 8,240 ZAR with SD = 568.6 average income of non-market participants. Thus a difference of 436 ZAR implied that farmers who participated in markets were at least 436 ZAR better off compared to those who did not participate in markets.

The results also revealed that market participants cultivated an area a little smaller than 1.2 hectares compared to 1.5 hectares cultivated by those who did not participate in markets. The results also revealed that the market participants were located at least 23 km (SD = 1.587) from the markets compared 24 kilometres for non-participants. This implies that an additional 1 kilometre away from markets will likely cause the respondents to withdraw from the markets. It was also observed that at least five percent of the respondents at SD = 0.345, who participated in markets, had received support from both the extension officers compared to one percent of the non-participants, who actually reported no financial assistance from the government. The findings also revealed that most farmers who joined farmer groups or associations did not participate more in markets than farmers who did not participate in markets or had joined farmer associations. The summary statistics are presented in Table 3.

Based on the results in Table 4, it can be observed that the most common crops grown in the study area were maize, potatoes, cabbage and butternut. Maize was the most widely grown crop (n = 189, 90%) and was harvested in 144,900 bags on average, with approximately sixty-eight percent of the harvest sold. The average number of households that planted potatoes was n = 96, with forty-five percent harvesting at least 26,800 bags. Out of these, a total of n=72 households sold their potatoes. Cabbage was the third most planted crop (n =96, 45% of households), with 111,700 cabbage heads harvested and at least ninety-seven percent sold. Butternut was the least planted, with at

Table 2: Farmer's demographic and socioeconomic characteristics

Variables	*Description*	*No. of HH*	*Proportion*	*Mean*	*St dv.*
Gender	Male	129	61.43		
	Female	81	38.57		
Age	21-40	17	8.1	61	12.7
	41-50	23	10.95		
	51-60	63	30		
	61≥	107	50.95		
Marital Status	Married	72	34.29		
	Not married	138	65.71		
Household Size	≤3	85	40.48	5	2.44
	4-6	83	39.52		
	7-9	33	15.71		
	10≥	9	4.29		
Education	None	15	7.14	7	3.65
	Primary	71	33.81		
	Secondary	114	54.29		
	Tertiary	10	4.76		
Primary Occupation	Farm	149	70.95		
	Non-farm	61	29.1		
Income	Farm	175	83.3	2870.95	
	Wage	44	21	590	
	Remittance	179	85.2	3445.5	
	Grant	204	97	1704.4	
Cultivated Farm Size	Less than acre	111	52.9	1.25	1.16
	More than acre	99	47.1		
Distance to Market	Within 10 km	21	10	23	16.7
	Above 10 km	189	90		
Financial Support	Yes	154	73.3		
	No	56	26.7		
Farmer Membership	Member	139	66.2	0.66	0.47
	Non-member	71	33.8		

Source: Author's computation based on survey data (2020)

Table 3: Mean statistics of farmers' characteristics and market participation (*n* = 210)

Socioeconomic factors	*Participants*		*Non-participants*	
	Mean	*Std. dev*	*Mean*	*Std. dev*
Share of households	78	5.383	22	1.518
Age	61	4.209	62	4.278
Married	2	0.138	2	0.138
Household size	5	0.345	4	0.276
Primary occupation	7	0.483	5	0.345
Household,income	8676.20	598.7	8240	568.6
Cultivated farm size	1.2	0.082	1.5	0.103
Distance to market	23	1.587	24	1.656
Extension service	5	0.345	1	0.345
Market training	3	0.207	0	-
Farmer association	6	0.4.14	9	0.621

Source: Based on survey data (2020)

least n=37 households selling at least fifty-nine percent of its produce. In total, ninety-two percent of farmers participated in markets, and at least 43.8 percent of their produce was sold. The summary statistics are presented in Table 4.

Factors Affecting Market Participation Decision

The market participation consisted of eleven explanatory variables as presented in Table 1. The findings revealed that five of the variables, namely,

Table 4: Farmers and crop production

Crop and its measure	*No. of households*		*Average quantity units (00)*		*Percentage sales*
	Harvested	*Sold*	*Harvested*	*Sold*	
Maize (10kgs)					
Yes	189	139	1449	988	68.2
No	21	50	0	0	31.8
Total	210	189			
Potatoes (10kgs)					
Yes	96	72	268	193	728
No	114	24	0	0	28
Total	210	96			
Butternut/Pumpkin (10kgs)					
Yes	47	35	27	16	59.2
No	163	12	0	0	40.8
Total	210	47			
Cabbage (Head)					
Yes	92	71	1117	1087	97.3
No	118	21	0	0	2.7
Total	**210**	**92**			**(43.8) 100**

Source: Based on survey data (2020)

age, marital status, cultivated farm size, access to extension services and membership of farmers' association were the key elements that could have had a substantial impact on the market participation decisions made by smallholder farmers. The age of the farmers was shown to be statistically significant at the one percent significance level ($p < 0.01$) and to be positively associated with the market participation behaviour of the respondents implying that farmers are likely to participate in markets as they grow older. However, age-squared showed a negative coefficient but significant at one percent significance level ($p < 0.01$). The basic intuition here is that having a positive effect of age and a negative effect of age-squared suggest that as farmers get older, the effect of age on market participation diminishes. That is, market participation increases with age and reaches a peak where it begins to decline as farmers grow older.

Being married has a negative (-1.054) and statistically significant at one percent significance level ($p < 0.01$) on farmers' market participation decision. Thus, farmers who are married, are likely not to participate in markets.

Table 5: Probit analysis of market participation factors of the smallholders

Market participation	*coefficient*	*Std. error.*	*z -values*	*P>z*
Const.	-10.8155	3.0688	-3.52	0.000
Gender	0.0929	0.2757	0.34	0.738
Age	0.4543	0.1101	4.13	0.000***
Age-squared	-0.0040	0.0009	-4.27	0.000***
Marital status	-1.0544	0.3723	-2.83	0.005***
Household size	-0.0374	0.0621	-4.27	0.547
Education	0.0012	0.0360	0.03	0.975
Primary occupation	0.3442	0.2742	1.26	0.209
Cultivated farm size	0.4357	0.1468	2.97	0.003***
Distance to market	-0.15645	0.115648	-1.35	0.176
Extension services	1.4666	0.3336	4.40	0.000***
Access to finance support	-0.0793	0.3688	-0.21	0.830
Farmer group membership	-1.1399	0.3386	-3.37	0.001***

***significance level at 1% probability; Wald Chi2 (12) = 58.76; Log likelihood = -14.13782; Prob > Chi^2 = 0.0000

The coefficient of size of land cultivated also revealed a positive and significant impact on market participation. This implies that increasing the area planted by one hectare will likely increase farmers' market participation by at least forty-four percent. Receiving support from extension officers' has a significance at the one percent level and is likely to enhance farmers' participation in markets (by 1.4666, 146%). Joining farmer groups or associations, although significant (at one percent significance level), is likely to reduce farmers participation in markets (-1.1399, 113%).

Farmers' gender was discovered to have a negative and non-significant effect on their decision to engage in the market. Household size reduces the farmers' desire to participate in markets by 3.7 percent. Meanwhile, although not significant, the coefficient of education variable (0.0012) revealed a positive relationship between market participation and the level of education of farmers, indicating that with an additional year of schooling, farmers are likely to participate in markets. Farming as a primary occupation increased participation in the market by at least thirty-four percent. The coefficient of distance to markets (-0.15645) revealed that the furthest the farmers are from the market, at least fifteen percent of them were not likely to participate in markets. Finally, being a member of farmers' association or cooperative significantly reduced (at 1% significance level) farmers' participation in markets. The probit model results are provided in Table 5.

DISCUSSION

The study examined the market participation of farmers together with their underlying socio-economic characteristics to establish whether they participate in the market, and to uncover their notable features that can possibly have an impact on their market participation behaviour. This analysis highlights the possible reasons for the poor and slow progress of market-oriented farming among the smallholders, with a focus on the challenges constraining farmers from taking advantage of the opportunities presented by the government's favourable policy position. Given the foregoing, it is clear that farmers in the Qamata, Zanyokwe and Tyefu regions participate in markets, and that there are payoffs for those who do so based on farm income contribution to family income. However, like in other parts of Africa, farmers grow more of the staple crops since they prioritise being food self-sufficient rather than market-oriented. In this study, maize emerged as a widely grown crop in the areas under study. Thus it was not surprising because maize is a staple crop often reserved for home use and it is only when farmers are satisfied with home consumption that a surplus will be sold or they will sell maize to meet some pressing financial needs. In line with Haile et al. (2022), a greater portion of the output is consumed at the household level and when they do participate in markets, most of their output is sold to informal unprofitable markets that in turn make them less profitable (Mujuru et al. 2022). As a result, the economic disparity between the two groups is minor.

The socioeconomic characteristics of the farmers indicate that the majority of the farmers are old. This is not surprising considering that the young seek lucrative opportunities elsewhere to improve their standard of living. Agriculture is, in fact, unappealing to young people due to the perceived low status and lack of career advancement associated with farming. The youth perceive agriculture as unsophisticated with no or little financial incentives, messy and exposed to inclement weather and far away from the glamour of city centres. As such to this day, the Water Research Commission (WRC 2022) confirms that youth participation in agriculture is limited. Meanwhile, elderly people lack the physical ability to engage with the manual labour that their farming system entails and to the extent required to develop a marketable surplus and successfully participate in markets.

The negative coefficient of gender and marriage is a basic indicator of how the traditional distribution of responsibilities and resources has influenced men and women's uneven access to important productive resources not only in South Africa but throughout Africa. For example, women's and men's roles are typically gender-differentiated. In many households, especially in married households, men are often viewed as household heads and providers, while women are primarily expected to conduct household duties (Hlatshwayo et al. 2021; Adeoye and Adegbite 2018). Agriculture, being the dominant economic activity in rural regions, has however, not kept pace with the financial needs of rural households, forcing men to go elsewhere for more lucrative and preferable possibilities than farming (Cheteni 2016). Mujuru et al. (2022) corroborated this assertion by revealing that while agriculture is

their primary source of revenue, non-farm income contributes significantly to family income than farm income. On the other hand, when agricultural production is left in the hands of women, their priority is to typically produce crops for subsistence usage (Akanle et al. 2019).

The findings show that household size should not be seen as a proxy for freely available household labour, as many authors including Hlatshwayo et al. (2021) and Siphesihle and Lelethu (2020) have suggested, but rather representing the dependence ratio. This signifies that when the family grows larger, there are too many people to care for, and relying mostly on agriculture for a living, as evidenced by the outcomes. They are then unable to generate marketable surplus over their consumption needs, limiting their participation in output markets. Having a reasonable level of education enhances farmers' ability to search and understand market information and market opportunities. Thereby enhancing their chances for networking and marketing their businesses (Mujuru and Obi 2020). As a result, they are more likely to participate in markets than those with low levels of education. However, the impact is modest, which explains why a majority of the educated rural people still relocate to urban centres for better opportunities.

In line with Mujuru and Obi (2020), the significant and positive outcome of the area of land cultivated in this study is an indication of how important land is in necessitating increased production and market orientation. However, land in these rural communities remains underutilised owing to communal tenure practises that make traditional chieftains the sole custodians of community land, who often allocate most of the land to themselves and their associates, leaving the rest of the land, which in most case is not so fertile or at close proximity to be shared amongst the farmers. Even with the introduction of the land tenure program of the post-apartheid reforms, there has not been substantial changes giving people the right to ownership and control of land (Wegerif 2022).

Both the descriptive and probit model results revealed that the furthest markets have a negative impact on farmer's market participation. For instance, the formal markets, which are supermarkets, are at least 23 km from the farm areas and this results in the transaction costs of the smallholder farmers outweighing their returns and thereby limiting the profitability of their output. This was substantiated by Hlatshwayo et al. (2021), who asserted that it is easier to access buyers who offer better payment, which also lowers their transaction costs when farmers are closer to towns than far away from the town.

The findings also support the important role of extension officers in ensuring that farmers receive information at a time, frequency, and form that is consistent with their needs. Through their experience, extension officers provide information and skills through guiding, counselling, and coaching to create the desired behavioural change for those involved (Maka and Aliber 2019). Nonetheless, Hlatswhayo et al. (2021) claimed that there is a paucity of extension officers, and those that are available lack proper market training and the competence to give effective guidance and market information. As a result, market results are not progressive.

Farmer associations are supposedly the link between farmers and the public sector agencies that support farmers with information about modern technologies and make it possible for individual farmers to access resources that would have been difficult to access if they acted alone (African Farmers Association of South Africa (AFASA 2021). Associations act as mouthpieces or lobbies for the farming community to represent their interests and secure for them the best possible deals with respect to access to financial and other resources that lead to better outcomes for farmers. In South Africa, farmer associations are central to the goal of democratising and integrating black farmers into the nation's agricultural and macro-economy. Although evidence in the literature demonstrates the successes that smallholder farmers achieve when they organise themselves into groups and work collectively to overcome market barriers (Sitole and Sitole 2019), the same cannot be said for these rural smallholders. The findings indicate that being a member of farmer associations or cooperatives in these communities has not been commensurate with the expectations. This rather confounding result could suggest that the farmer associations are not living up to their mandates of empowering the farmers to produce more and sell it. However, it should somehow be expected, as Khapayi and Celliers (2016) indicated in their research that many of these farmer associations are managed by inexperienced people who lack the know-how to guide the farmers in the right direction.

CONCLUSION

The crucial role of market participation in smallholder agriculture has long been recognised and is particularly indispensable in the context of rural

South Africa, where alternative income-earning opportunities are virtually non-existent. Markets are the only platforms for remunerative economic participation. While South Africa has made significant efforts to create an enabling environment for smallholder transformation, access to markets for smallholders in the Eastern Cape's homelands remains a challenge. Although the findings revealed significant behavioural changes in the shift from subsistence towards markets, the demographics and farmer characteristics indicate that it is just a shift in the numbers of farmers but not the volume of crops produced. Subsistence farming remains dominant in the study area. This reflects the realities of rural life in South Africa where farmers sell not because they have a surplus of food, but rather because they are desperate to acquire other non-agricultural products. In general, marketing occurs from a surplus, and where none exists, it would therefore be unrealistic to expect otherwise. The findings suggest that demographic and farm characteristics are critical in explaining smallholder market participation behaviour in the study area. Thus, besides that farmers are old, gender norms and practices underpin rural agriculture, which impede market orientated systems.

RECOMMENDATIONS

If smallholder agriculture is to play its role in increasing food security and lowering rural poverty, strategies that diversify the demographic characteristics of the farmers and the mode of organisation and technological profile of the farms are imperative. For example, changes in the age profile of the farming population must take place. The goal should be to draw more young people into farming because the youth are clearly not taking advantage of the sector's opportunities considering their negative perception of agriculture. It is, therefore, recommended that measures to entice young people to work in agriculture and change their mind-set and perception of agriculture be explored. In fact, if farming is to be attractive to young people and for young farmers to see the prospects in it, science and technology must form an integral part of farming. Agricultural production requires people who keep up with developments and changes. All these are achievable through education and awareness programmes. However, not many rural farmers have undergone this, as agriculture and farming knowledge are passed down from parents to children. This calls for academic institutions, business and government to revise the curriculum and strengthen the relevant systems and structures necessary to prepare young people from an early age.

LIMITATIONS

The use of quantitative methodologies constrained the findings since respondents had limited response possibilities based on the researcher's selection. More insight into the causes of limited market participation may have been identified, if both qualitative and quantitative approaches had been employed. Qualitative data would have also allowed the researchers to analyse the non-quantifiable responses, thoughts and sentiments of the respondents.

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AUTHOR CONTRIBUTION

ME Lesala: Conceptualised the idea, designed the structure of the paper, methodology, data curation, analysis and writing of draft and final manuscript. A Obi: Data curation, supervision, review and editing of the manuscript.

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