Market Participation Decision of Emerging Farmers Under the Land Restitution Programme in Limpopo Province, South Africa

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ABSTRACT

This paper examined the factors influencing market participation decisions and the level of the emerging farmers under the land restitution programme in Limpopo Province, South Africa. The study used stratified and purposive sampling to sample 200 emerging farmers. The results of the descriptive statistics revealed that approximately 33% of emerging farmers participated in the markets. The double-hurdle results indicated that age, post-settlement support, training, irrigation, market information, transportation, credit access, extension services and farmer association membership positively influenced participation decisions and level. In contrast, non-farm businesses, sources of income and enterprises negatively influenced participation decisions and levels. This paper recommends providing support services entailing credit, training and marketing cooperatives to improve and strengthen market participation by emerging farmers in Limpopo Province.

Keywords: Double-Hurdle Model, Market Participation, Land Restitution, Emerging Farmers, Limpopo Province.

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1.   INTRODUCTION

The newly elected government implemented the land reform plan outlined in the new legislation and the white chapter on the South African land policy in 1997 after the apartheid regime ended in 1994. The main objective of land reform is to address the consequences of the racially biased land dispossession that occurred during the period of colonisation and racial oppression. The land reform programme comprises three components: land restitution, land redistribution, and land tenure. The main aim of the Land Restitution Programme (LRP) is to "restore land and provide other remedies to people dispossessed by racially discriminatory legislation and practice, in such a way as to provide support to the vital processes of reconciliation, reconstruction, and development" (Department of Land Affairs [DLA], 1997).

The imperative basis of market participation is the evidence of income; hence, the livelihoods of emerging farmers would improve if they had better access to outlets where they could sell their produce. Improved market access and information for rural farmers appeared to be a precondition for agricultural-based economic development and the enhancement of rural household employment (Berthe & Mali, 2015). Thus, enhancing farmers' transformation lies with establishing the numerous efficient and well-functioning markets in South Africa. The expectation is that these markets will reduce transaction costs, minimise risks, and allow a uniform flow of information to the role players or actors in the value chain of their products. Therefore, linking emerging farmers to markets is imperative for the sustainable development of the farming sector in an agricultural-based economy (Kabeto, 2014). Despite the establishment of efficient and well-functioning markets in the country and globally, which brought about market liberalisation policies, the lowering of trade barriers, and changes in the global agricultural economy, market participation of emerging farmers has not significantly improved in many developing countries (Hlatshwayo *et al*., 2021; Mmbando *et al*., 2015). Improved market access is supremely significant in increasing the market participation of emerging farmers and the level required to participate therein (Mortona & Martey, 2021). Avoiding factors limiting market access, such as poor infrastructure, high transaction costs, information asymmetries, and weak institutions, will enhance market participation for rural farmers (Jagwe *et al*., 2010).

The South African government has implemented several types of support to empower emerging farmers. One of the resolutions implemented was to support the growth of rural market institutions through the provision of infrastructure and by aiding rural emerging farmers to build organisations which should assist them in accessing markets, building links with the formal market value chains, and coordinating their activities to enjoy economies of scale (Department of Agriculture, Forestry and Fisheries [DAFF], 2011; DAFF, 2013). Additionally, such organisations may comprise farmer cooperatives, smallholder associations, input supply cooperatives, marketing cooperatives, and government-regulated institutions deliberated to support and promote market participation amongst emerging rural farmers (Aliber *et al*., 2013). Despite the government's upright efforts, emerging farmers' market participation has not knowingly improved in South Africa (Hlongwane *et al.*, 2014; Jordaan *et al.*, 2014; Maponya *et al.*, 2015). The extent to which post-settlement support influences the incentive of emerging farmers to participate in a market and to what level they participate still needs to be addressed. Thus, this paper aims to answer the question above and identify the factors influencing market participation decisions and the participation level among emerging rural farmers.

2.   FACTORS INFLUENCING MARKET PARTICIPATION OF EMERGING FARMERS

Land restitution beneficiaries possess the potential to transform into commercial farmers, provided their basic needs are addressed after the provision of settlement support (Titus, 2017). Land restoration must be accompanied by infrastructure development, agricultural training, and investment in young people to possess functional restitution projects. Contrarily, Sibisi (2015) contends that, despite all the effort that the government and other private investors have extended since the land claims were settled, the land restitution farms still lack the necessary backing to exploit the land efficiently and sustainably. Masoka (2014) further acknowledged that the explanations overdue for such circumstances are caused by a lack of access to infrastructure, finance or credit, inputs, and output markets.

Transaction costs involve any costs incurred when searching, bargaining, and negotiating contracts with a buyer of goods or services. According to Mmbando *et al*. (2015), most emerging farmers classify transaction costs as a restriction to market participation. These costs are involved every

time a buying and selling process occurs in the marketplace. Transaction costs include expenses encountered chiefly by farmers and consumers. Such expenses relate to poor infrastructure, inputs and outputs concerning market distance, high marketing margins, and a lack of information. Several studies have indicated that transaction costs are the major barriers to market participation by emerging farmers worldwide (Jagwe *et al*., 2010; Hlatshwayo *et al*., 2021; Mortona and Martey, 2021). This occurs because many emerging farmers are situated in rural areas with poor infrastructure and a lack of access to effective market information while far from formal markets (Maponya *et al.*, 2015). Jagwe *et al*. (2010) emphasised that poor access to markets, unworthy roads, and inadequate road networks increase transaction costs, all discouraging market participation.

Among other variables, public support or services-related variables (e.g., extension services, access to credit, veterinary services and farm associations) play an important role in the market participation decision. Loans are crucial to reducing the capital needed by capital-limited farmers to enable the running of farm activities timeously and according to expectations. Paramount attention and the establishment of credit institutions are required in rural areas to ensure that the credit needs of rural farmers are satisfied. Credit accessibility positively influences the decisions of farmers to participate in the market. It allows emerging farmers to buy more land and the necessary input to produce on a larger commercialised scale (Tura *et al*., 2016). Kassahun *et al*. (2020) also found that credit services positively affect market participation and the level of small ruminants because households using these services would buy required inputs at the right time, which would increase market participation. Fikru *et al*. (2017) also reported a positive association between market participation and credit access. They showed that credit reduces transaction costs and increases farmers' buying power. The farm association positively influences market participation; therefore, encouraging farmers to join or establish a farmer's organisation in rural areas could promote market participation. This finding was reported by Reyes *et al*. (2012) in Angola.

Private assets and farm-related variables (e.g., livestock owned, irrigation, land size, and non-farm businesses) also play a crucial role in influencing the market participation of emerging producers. Farmland, regarded as an essential factor of production, is needed by farmers to practise farming.

Sinyolo *et al*. (2017) reported a positive relationship between maize market participation and farmland size. This is so because the available land allows farmers to produce enough to sell on the market. Various studies have also revealed this good relationship between land size and market participation (Osmani & Hossain, 2015; Tura *et al*., 2016), emphasising that farmers who owned adequate land would have a better chance to use sufficient land for the production of produce for the markets. Owning productive assets such as irrigation enables farmers to take risks for their farm business owing to their ability to boost yield. Reyes *et al*. (2012) indicated that productive assets increased the likelihood that farmers could sell more produce.

3.   RESEARCH METHODOLOGY

3.1.1. Study Area, Data Collection and Sampling Procedure

The study occurred in the three districts of Limpopo Province, namely Waterberg, Capricorn, and Sekhukhune districts. Limpopo Province covers an area of 12.46 million hectares, which comprises 10.2% of the land area of South Africa (Oni *et al*., 2012). Primary data were collected using a structured questionnaire from January 2021 to January 2022, even though the Covid-19 pandemic and national lockdowns delayed this process. The study employed a stratified sampling procedure to sample one group of emerging farmers in the Waterberg and Sekhukhune districts and two groups of emerging farmers in the Capricorn district, making four groups. The purposive sampling was then adopted to sample 50 emerging farmers from each stratum or group, totalling 200 respondents. The Department of Agriculture, Land Reform and Rural Development (DALRRD) provided a list of farmers in the three districts.

3.1.2. Econometrics Estimation: The Double-Hurdle Model

The double-hurdle model (Cragg, 1971) identified factors influencing market participation decisions and the participation level of emerging farmers under the land restitution programme. This model is categorised into two steps. The first step is taken when the farmers decide whether or not to participate in the market using probit analysis, and the second step is taken when the farmer decides on the level of participation achieved using truncated analysis. In the first step, the model takes a value of 1 and 0, which represents whether a farmer decides to participate or not. In

the second stage, truncated regression that excludes part of the sampled observation based on the dependent variable's value, determines the participation level. The model is formulated as follows:

Participation decision: $Y^*_{i1} = Z_{i\alpha} + U_i$ (1)

$Y^*_{i1} =$ if $Y^*_{i1} > 0$

$Y^*_{i1} = Y^*_{i1} < 0$

Level of participation decision: $Y^*_{i2} = X_{i\beta} + V_i$ (2)

$Y_i = X_i + V_i$ if $Y^*_{i1} > 0$ and $Y^*_{i2} > 0$

Where:

Y^*_{i1} is a latent variable representing an emerging farmer's participation decision.

Y^*_{i2} is a latent variable representing emerging farmers' level of decision.

Y_i is the observed market participation (dependent variable)

Z_i and X_i are vectors of explanatory variables relating to participation and level of participation, respectively.

α and β are the coefficients to be estimated, while U_i and V_i are the error terms, also called disturbance terms. Table 1 presents the list of the variables used in the study.

TABLE 1: Description of Variables in Double Hurdle Model

Variable	Unit of measurement	Expected sign
Dependent variable		
Market participation	Dummy (1= participate, 0=otherwise)	
Independent variable		
Household characteristics		
Age	Years	+
Gender	Dummy (1= male, 0= otherwise)	+
Source of income	Dummy (1= social grant, 0=otherwise)	+
Education level	Dummy (1= high school, 0=otherwise)	+
Transaction cost variables		

Market information	Dummy (1=access to information, 0=otherwise)	+
Transportation	Dummy (1= had transport, 0=otherwise	+
Public support and services		
Post settlement support	Dummy (1= received settlement support, 0=otherwise)	+
Training	Dummy (1= trained, 0= otherwise)	+
Extension services	Dummy (1= access to extension services, 0= otherwise)	+
Credit access	Dummy (1= access to credit, 0=otherwise)	+
Farmer association membership	Dummy (1= a member, 0=otherwise)	+
Private assets		
Non-farm business	Dummy (had business, 0= otherwise)	+/-
Irrigation	Dummy (had irrigation, 0=otherwise)	+
Enterprise farming	Dummy (1=livestock farming, 0 otherwise)	-

4.   RESULTS AND DISCUSSION

4.1.   Socio-Economic Characteristics of Emerging Farmers Under the Land Restitution Programme by Market Participation Status

Table 2 summarises the statistics for the dependent variable (market participation) and all independent variables included in the double hurdle regressions, together with the significance level of the tests of difference between the means for each variable for the market participants and non-participants. The results showed that approximately 33% of emerging farmers under the land restitution programme participated in the market. There are no differences regarding the age and source of income between the participants and non-participants. The average age of the farmer who participated in the market is 48 years, and that of the non-participants is 47. The source of income in both categories is derived from a social grant, as indicated by 51% of participants and 52% of non-participants. The differences in gender of the emerging farmers between market participants and non-participants were statistically significant at a 5% level. On average, fewer

male farmers (48%) participated in the market than female farmers. The market participant and non-participants had 43% and 62% of emerging high school-level farmers, respectively.

TABLE 2: Summary Statistics of the Variables Used in Double Hurdle Regression

Variables	All participants (N=200)	Participants (N=65)	Non-participants(N=135)	T test
	Mean	Mean	Mean	P value
Age	47.47	47.985	47.222	0.735
Gender	0.575	0.477	0.622	0.051
Source of income	0.520	0.508	0.519	0.886
Education level	0.555	0.431	0.615	0.014
Market information	0.205	0.523	0.052	0.000
Transportation	0.395	0.631	0.281	0.000
Post settlement support	0.705	0.985	0.570	0.000
Training	0.190	0.308	0.133	0.003
Extension services	0.480	0.615	0.415	0.007
Credit access	0.335	0.323	0.341	0.805
Farmer association membership	0.250	0.446	0.156	0.000
Non-farm business	0.155	0.138	0.163	0.655
Irrigation	0.412	0.862	0.121	0.000
Enterprise farming	1.130	0.138	0.659	0.000

The difference in transaction cost variables, namely market information and transportation, between the market participants and the non-participants was statistically significant at 1%. Approximately 52% of the market participants had access to market information and owned transport. The result revealed that most market participants (99%) received settlement support after restoring their land, and 62% had access to extension services. The results further showed a

significant difference in farmer association membership, as 45% of the market participant category were members of farmer associations. In contrast, only 16% of the non-participants were members of such associations. Very few emerging farmers (14%) rearing livestock enterprises indicated that they participate in the market, whereas the majority of them (66%) did not participate in the market.

4.2. Factors Influencing Market Participation Decisions and Level of Emerging Farmers Under the Land Restitution Programme

Before selecting a perfect model for regression, a correlation matrix and variance inflation factor (VIF = 7.81) were used to check the multicollinearity problem between the independent variables. The results showed a moderate to low correlation among the variables. According to James *et al*. (2013), a VIF between five and ten is acceptable because it shows a moderate correlation, while a VIF greater than ten is unacceptable because it indicates a high correlation among the variables. Table 3 presents the double hurdle regression's estimated coefficient, standard error, and marginal effects. The results demonstrate that the independent variables used in the probit and truncated models collectively explain the market participation decision and level of the emerging farmers under the land restitution programme and further indicate that the specification of the model provides a good fit of the data used, as indicated by Pseudo R^2 = 77%.

The variable **age** was positively significant at 5% in influencing the decision of farmers to participate in the market, but not the level of participation. The results imply that for every additional year of a farmer's age, there is a greater chance of market participation. This result should be accurate because the assumption is that older farmers have developed market connections and are more experienced compared to young farmers. Senyolo *et al*. (2018) reported a positive relationship between age and market participation decisions. **The sources of income** negatively influenced the decision of the emerging farmers to participate in the market, but not the participation level. The leading source of income appeared to be derived from social grants. This result highlights that farmers receiving social grants as an income are less likely to participate in the market. Senyolo *et al*. (2018) reported a negative relationship between the social grant and participation decision variables.

Market information positively influenced the market participation decision by 1%, but there was no statistical relationship between market information and participation level. This finding implies that emerging farmers with access to information regarding input and output prices, demand and supply in the market, and potential buyers and sellers are more likely to participate in the markets. Mohammad *et al.* (2021) reported this positive relationship between market information and participation decisions. **Transportation** positively influenced the participation decision and level and was highly significant at 1%. Farmers with transport increased the participation decision by 54% and the level of participation by 15%. This is because transport availability reduces marketing costs and effectively influences the time delivery of produce to market, unlike depending on hired or public transport for produce distribution (Khapayi & Celliers, 2016). Similar findings were reported by Gebremedhin and Jaleta (2012).

Post-settlement support positively and highly significantly affected the market participation decision and level, highlighting that emerging farmer with settlement support, which may be in the form of skills transfer, funding, seeds and implements, feeds, etc., were allowed to commercialise their farming. Mphahlele (2016) concurred with this finding, stating that the Comprehensive Agricultural Support Programme (CASP) successfully promoted the livelihood of the beneficiaries by increasing their income through market participation. **The training** was positive and statistically significant, highlighting that a well-trained emerging farmer is likelier to participate in the market. Marginal effects result showed that training variable increases the likelihood of a decision to participate in the market by 55%. Similar results were conveyed by Sinyolo *et al.* (2017), who recorded that a focus on agricultural training would improve farmers' market participation decisions and participation levels. Access to **extension services** positively affected the decision to participate in the market only, highlighting that farmers with access to extension services increased the probability of participation by 67%. The finding is realistic because, through agricultural extension services, emerging farmers would have access to market information, input and output market, and be more alert about new technologies and climatic conditions. This result is supported by the detection made by Maake and Antwi (2022), who stated that public extension services and advisory services help facilitate access to agricultural information and agricultural skills-related advice for emerging farmers.

TABLE 3: Double Hurdle Results

Dependent Variable: Market participation	Probit results and marginal effects			Truncated results	
Independent Variable	**Coef**	**Std error**	**Dydx**	**Coef**	**Std error**
Age	0.042	0.019**	0.011	0.001	0.001
Gender	-0.636	0.469	-0.172	-0.028	0.033
Source of income	-1.184	0.644*	-0.298	-0.009	0.035
Education level	-0.697	0.483	-0.182	-0.028	0.032
Market information	2.480	0.841***	0.763	0.047	0.055
Transportation	2.268	0.847***	0.544	0.153	0.041***
Post settlement support	4.055	1.064***	0.697	0.248	0.053***
Training	1.665	0.771**	0.552	0.096	0.046**
Extension services	2.662	0.851***	0.667	0.015	0.049
Credit access	1.196	0.638*	0.264	-0.035	0.033
Farmer association membership	-0.094	0.845	-0.024	0.156	0.043***
Non-farm business	-1.924	0.786**	-0.270	-0.090	0.041**
Irrigation	4.837	2.027**	0.970	0.325	0.045***
Enterprise farming	-1.027	1.380	-0.265	-0.479	0.041***
_cons	-3.027	2.087		0.505	0.085***
Sigma				0.011	0.000***
N= 165; LR chi^2(15) = 171.43; Pseudo R^2 = 0.7748; Wald chi^2(15) = 880.60; Mean VIF= 7.81					

Note: *, **, *** means significant at 10%, 5%, 1% levels respectively.

The estimated coefficient of **credit access** was positive and significant at 10% in influencing farmers' decisions to participate, but not the level at which they participate in the market, implying that farmers with access to loans are more likely to participate in the market. As expected, credit

accessibility grants emerging farmers the opportunity to buy necessary inputs and to improve their production, hence commercialisation. These findings are consistent with the results revealed by Tura *et al*. (2016), who asserted that credit access increases the likelihood of participation decisions because the availability of loans reduces transaction costs. **Farmer association membership** affected only the level of market participation positively and highly significantly at 1%, highlighting that members of the association are more likely to increase their level of participation by 16%. As anticipated, being a member of a farmer association was projected to increase the level of participation as the farmers would have a platform on which to share market information and to link with potential consumers at a lower cost, thereby lessening the fixed transaction costs of market participation (Jagwe *et al*., 2010; Mmbando *et al*., 2015).

As anticipated, the **non-farm business** variable exerted a negative impact on both the decision to participate and the participation level, implying that non-farm business owners lack the time or fail to invest their time in both farming and non-farm business and; as a result, they neglect and fail to participate in agricultural markets. In contradiction, Sinyolo *et al*. (2017) found that non-farm business owners participate more in the agricultural market, and non-farm income increases market participation (Apind, 2015). On the other hand, Davis *et al*. (2013) reported that farmers with high non-farm incomes are less likely to participate in the market. An optimistic relationship is portrayed between market participation decision, participation level and **irrigation**, implying that the farmers with irrigation assets are more likely to transform their farming from being classified as emerging to commercial. Emerging farmers owning irrigation assets had a 97% probability of participating in the market. In support of this finding, assets allow emerging farmers to produce an excess commodity necessary for market sales (Reyes *et al*., 2012). The **enterprise farming** coefficient, dominantly livestock production, negatively and significantly affected the level of participation only at a 1% significant level. This is an expected result because most of the livestock farmers in the Limpopo Province lack markets for their production. The finding aligns with the findings of Haile *et al*. (2022), who found that livestock and crop farming compete for the available resources, and livestock ownership reduces the market participation level in crop production.

5.   CONCLUSION AND RECOMMENDATIONS

The question addressed in this paper concerned the extent to which post-settlement support and transaction costs affect the market participation of emerging farmers under the land restitution project. A summary of the statistics results showed that most of the land restitution beneficiaries are involved in livestock farming and lack access to formal markets. In addition, male figures confirmed being more involved in farming than females. The double-hurdle results indicated that age, post-settlement support, training, irrigation, market information, transportation, credit access, extension services and farmer association membership positively influenced market participation decisions and level. In contrast, non-farm businesses, sources of income and enterprises negatively influenced participation decisions and levels. It is concluded that emerging farmers who received post-settlement support after restoring their land were likely to participate in markets, and they increased their level of participation by 25%.

Regarding the transaction cost variables, farmers with access to market information were more likely to decide to participate in markets; however, there was no statistical relationship between market information and market participation. Furthermore, the transportation variable showed a positive relationship between market participation decision and level, indicating that transport availability will allow emerging farmers to transport their products to market on time and in good condition. Those who also had access to market information participated in the market.

Through training that statistically and significantly influenced market participation, this study reinforces that farmers learn about the imperatives of choosing the right enterprise to avoid the issue of producing without a market. Before engaging in farming, farmers should learn more about the performance of their products in the market and where markets are allocated, especially when dealing with livestock farming. Alongside this strategy, emerging farmers should receive education about the importance of farmer associations and be persuaded to join them because they offer a platform from which farmers could learn, improve, and share with other farmers. Lastly, the paper recommends that responsible parties prioritise providing credit access to farmers for enhancing sustainable supplies of good-quality products. Credit accessibility is important in cutting transaction costs and allowing farmers to improve and increase their production.

6.   ACKNOWLEDGEMENT

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