Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 12, Issue 7, July 2021: 8678 - 8690

Research Article

Access To Local Agricultural Markets And Information For Subsistence Farmers In Clau-Clau Mbombela, South Africa

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ABSTRACT

The study examined the factors affecting smallholder farmers access to local agricultural markets in Clau-Clau, South Africa. Random sampling method, and structured questionnaires were used to obtain responses from 330 subsistence farmers. The hypothesis was tested using multinomial regression analysis. The study found that farm size (P<0.016) was significant and positively related to the choice to participate in local markets. However, farm experience (P<0.043), contact with extension services (P<0.043), membership of association (P<0.013), access to credits (P<0.000), and distance (P<0.010)from farm to markets were the independent variables found to have significant relationship with participation in local markets. Concerted effort should be made to encourage joint action to link subsistence farmers to markets. Networking for information sharing is important for agri-business supply chain and marketing. Marketing infrastructures and food safety environment must be provided to avoid local consumers shifting from patronizing local markets. The developmental initiatives of empowering smallholder farmers should not only be seen in a parochial context of farm subsidy, land redistribution and restitution, but in a wider domain of access to formal markets, credits, training, and advisory services.

Keyword: Access, agriculture, markets, information, subsistence farmers, participation, involvement, consumers, supply chain, determinants

INTRODUCTION

An estimated population of 1.5 billion smallholder farmers across the world are in one way or the other engaged in agriculture for livelihood and subsistence. These smallholder farmers are mainly found in the rural areas, and they contribute significantly to the rural economy. Despite their apparent role as food producers, their commercial prowess and ability as smallholder farmers remains challenging. In Sub-Saharan Africa (SSA), smallholder farmers accounts for almost 70% for overall contribution to employment, 40% to exports and 33% to gross domestic product (GDP). Nevertheless, smallholder farmers are constrained by inadequate access to local markets, while still contending with other numerous challenges especially in quality assessments and value chain issues (Colen, Demont, &Swinnen, 2013).

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With gradual improvement in agricultural infrastructure and information communication technology (ICT), there are glimpse of hope and opportunities for the expansion of export markets for those farmers who can buildup resilience by linking production with local agricultural markets(Ashby, *et.al*, 2011). Notwithstanding the minimal growth in production and export markets, smallholder farmers in developing countries arenot transitioning to commercial farming and lack adequate access to markets. In a studyby World Bank Development Report (WRD)'Agriculture for Development'(2007)posited that poverty reduction by engaging agricultureas a tool will only befeasible when there is increased focus on investment in agriculture, particularly in developing countries. The WRD report highlighted the typology of rural poverty in three agricultural constructs:agriculture-dependent, transforming, and urbanized. The entire SSA is entirely agriculture dependentand increasing agricultural intensification requires refining access to local markets for smallholder farmers. In the foreseeable future, the alleviation of poverty in South Africa will be hinged on stimulating agricultural growth through pursuing the numerous poverty alleviation programmes already in place (Agholor, 2013). Local access to markets is importantand desirable for emerging smallholder farmers to succeed and become productive and relevant in the value chain (Van Schalkwyk *et.al*, 2012).However, the developmental initiatives of empowering smallholder farmers should not only be seen in a parochial context of farm subsidy and land redistribution and restitution, butin a widerdomain that encompass access to local and formal markets, credits,training, and advisory services.

Study by Poole, *et.al*, (2013) found that one of the challenges of Zambian cassava productionwasthe inadequate linkage between smallholder farmers and markets, and lack of entrepreneurial skills. Theparticipation in agricultural markets by smallholder farmers is dependent on attitude and perception in terms of accrual benefits.However, the rule is that farmersare risk-averse, and decisions are made to maximize utility within the range of existing challenges or opportunities (Dlamini-Mazibuko, Ferrer, &Ortman, 2019). The envisaged challengescould be the cost of participating in marketing, knowledge of market principles, state of roads and transport, and subjective norms. The accessibilityof markets is important in allowing emerging farmers into the mainstream commercial agriculture because it isthe determinants ofachievement. Access to market is often limited by inadequate information on prevailing prices, market forces (demand and supply), bargaining power, physical access to markets, market structure, relationship between and farmers and market intermediaries' and alternative marketing channels (International Fund for Agricultural Development, 2003). Market information if available to the farming community, may not be processed and disseminated adequately to the advantage of many farmers. In many countries, investing in smallholder farmers are recognized and valuedas a means of reducing poverty and unemployment. There are policies in place to enable smallholder farmers to identify markets locally, and to drive supply chain of locally produced staple foods (Adjognon, 2012; Chapagain&Raizada, 2017; Khapayi&Celliers, 2016).

Smallholder farmers in developing countries have inadequate access to land, labour, capital, and entrepreneurial skill, credit information, and markets (Lyne, 1996). In South Africa, smallholder farmers access to market is constrained by policies and are in some cases limited bylocation, type of farming, type of commodity, farmer discrimination and institutional capacity (Makhura and Mokoena, 2003). The report of National Agricultural Marketing Council (1999) summarized the challenges of smallholder farmers in accessing markets as follows: transportation and poor roads-most farmers do not have their own means of transport, inadequate and unsuitable farm-produce collection points, long distance between produce collection points and the National

Fresh Produce markets. As part of solving the problems of market access, the government of South Africa deregulated agricultural market and liberalized trade prior to 1994. However, the market deregulation and liberalization effort of government did not surmount all the associated problems of market access (Makhura and Mokoena, 2003). Nevertheless, substantial efforts have been made by agencies like the World bank, International Fund for Agricultural development (IFAD), and International Food Policy Research Institute (IFPRI) to overcome the challenges of market access by smallholderfarmers. Numerous researchers(Bienabe et al. (2004), IFAD (2003), Minot and Hill (2007), and the World Bank 2007) concluded that there are four notable constraints to smallholder farmers access to markets as follows: high cost of transaction in the value chain, the risky nature of agricultural produce, poor infrastructure, and price variations, and the weaking of the primary markets and inadequate bargaining power of farmers and sellers. Against this backdrop, the study examined the factors affecting smallholder farmers in accessing local agricultural markets in Clau-Clau, South Africa.

METHOD

The site for the study was Clau-Clau in Mbombela, Ehlanzeni district of Mpumalanga province. Mbombela Local Municipality is a Category B municipality and form part of the Ehlanzeni District. It is one of the four municipalities in the district, that make up almost a third of its geographical area. It was established by the amalgamation of the Mbombela and Umjindi Local Municipalities in August 2016(Statistics, South Africa, 2012). Mbombela, serves as an entrancegate to some of the best agro-ecological zones in Southern Africa, with its modest climate. Sub-tropical fruits (like mangoes, avocados, oranges, lemons, litchis, and bananas) thrive well in the area. Clau-Clau is one of the villages in Mbombela,ward number 10, GPS coordinates of S25^0 28''26.2'' E031^{o}and dominated by smallholder farmers who are involve in the cultivation of grains and vegetables (Mbombela Municipality 2020).

Figure 1. Map showing the study area (Clau-Clau)

Sampling Procedure

Random sampling method was used with an indication that no special treatment of groupsin the sampled population. The likelihood of any member of the group being selected does not depend on any other member of the population.This technique used, avoided gender and distance biases, and330 samples were taken from Clau-Clau community. The structured and semi-structured questionnaires were used to solicitinformation and were divided into two sections: the first part concentrated on socio-economic demographics of the smallholder farmers while the second partidentified available markets, and the level of participation by smallholder farmers. Current literature on markets, factors affecting market access and extent of participation by smallholder farmers werereviewed to complement data variation and validityfor detailed analysis of information.

Method of Data Analysis

The descriptive statistics which embed the frequency, mean and percentages were used and the extent of smallholder farmer's participation in markets in Clau-Clau was measured on three points rating scale of 'Always' (3), 'Occasionally' (2), 'Not at all' (1). Benchmark $\bar{X}$ of 2.0 was used for decision making. Decision: ≥ 2.5 indicates high involvement, < 2.5to 2.0 indicates moderate involvement, < 2.0 indicates low involvement.

Logical framework and empirical model

The hypothesis on the influence of the socio-economic characteristics of farmers participating in market was tested using ordinary least square regression (OLS) analysis, and by employing the scientific package for social science software (SPSS version 27).

The collected data were screened for quality of information gathered from the field survey. The process involvesediting and highlighting salient errors of omission in the computation and testing the imputed data for missing values. This initial handling of data assisted in manipulating the process for good result analysis. The multinominal regression was used for determining the relationship between the variables which were coded as independent and dependent. The determinants of participation in local markets or otherwise,suggest individual direction to maximizeutility because subsistence farmers like any other human are rational in behaviour. Multinominal regression model used to examine farmers' decisions to participate in marketswere as follows:

$$\text{Logit (Pi)} = \ln (Pi / 1 - Pi) = \beta 0 + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \beta 5\ X5 + \beta 6\ X6 + \beta 7\ X7 + \beta 8\ X8 + \beta 9\ X9 + \beta 10\ X10 + e$$

Where:

$ln\ (Pi / 1 - Pi)$ = logit for local market participation

Pi = not participating in markets,

$1- Pi$ = participating in markets

$X1$-$X10$ = independent variables

βi = parameters to be estimated

e = error term

The choice or decision to participate in local market were presented as dependent variables with the assigned values*1-Pi*, and if not *Pi*.The table 3, indicate the independent variables with a *priori*expectations as follows: Age as a continuous variable was indicated in years, with the

expectation that younger farmers may be disposed to adventures and are less likely to be risk averseas compared to older farmers (Knowlers and Bradshaw, 2007). The level of education was regarded as dummy variable with the value of 1 if farmers are literate and 0 otherwise.Literate farmers tend to adopt innovation more rapidly as compared to uneducated ones.Furthermore, educated farmers tend tomake informed decisions which may improveparticipation in markets and other production practices. Therefore, thehigher the level of education the higher the propensity to participate in local agricultural markets. Farm experience as a continuous variable was measured as the number of years a farmer remained in farming.

Table 1. Description of the independent variables used in the multinomial logistics regression

Variables	Coding description	Category	Expected sign
X_1 = Age	Number of years	Continuous	-
X_2 =Level of Education	1 for literate farmer, 0 if illiterate	Dummy	+
X_3=Farm experience	Number in years	Continuous	+
X_4=Farm size	Number in acres	Continuous	+
X_5=Distance from farm to market	Number in kilometres	Continuous	+
X_6= Access to market information	1 if yes, 0 otherwise	Dummy	-/+
X_7 = distance from farm to market	Number in kilometres	Continuous	-/+
X_8= Produce output	Number in kilogrammes	Continuous	-
X_9=Membership of cooperatives	1 if member, 0 otherwise	Dummy	-/+
X_{10}= Contact with extension	1 yes, 0 otherwise	Dummy	+
X_{11}=Farm credit	1 yes, 0 otherwise	Dummy	+

Farm experience is expected to influence market participation, as more experience farmers are disposed to informed decision making. Farmers access to information related to market were measured by the capability to access local market. The access to market information was indicated as dummy variable, and a farmer with access to market information takes the value of 1 or 0 otherwise. However, access to market information was expected to affect the decision of participating in local markets. Distance from the farm to the market was measured in kilometres and regarded as continuous variable. The farther the farm from the market, the less likely the decision to participate in market as transportation cost may increase the cost of sales. However, it was conjectured that proximity from farm to market may be negatively related to participation in local markets. The farm size was measured in acres. In most communities, farm size is regarded as an expression of good production performance. Therefore, farm size as a surrogate for performance was expected to influence participation in local market. However, prevailing price of farm produce in the market was explained in Rand value and set as continuous variable.

Production output was also measured in kilogrammes and indicated as continuous variable with the assumption that higher output will influence participation in local markets. The higher the output, the more the inclination to search for marketing channel to dispose the farm produce. Membership of cooperative association was assumed as dummy variable with the value of 1 if farmer participate in cooperative activities and 0 otherwise. Membership of associations creates room for social interactions and thus assist with market information. It is expected that membership of cooperative association will influence participation in local markets. Contact with extension service was set as a dummy variable with farmers who had contact with extension services takes the value of 1 and 0 otherwise. Extension provides valuable information about market and marketing activities. It was hypothesized that farmers who had extension contact are more likely to participate in local market. Access to credit was regarded as dummy variable. Farmers who had access to credit takes the value of 1and 0 otherwise. Farm credit assist farmers with increased production and other farm expenses. There is the likelihood of improved production if a farmer is assisted with farm credit. Therefore, farm credit is expected to influence farmers participation in local markets.

RESULTS AND DISCUSSION

Summary of socio-demographic characteristics of farmers in the study area

Table2 presents the summary of socio-demographic characteristics of smallholder farmers in the study. Almost 20% of smallholder farmers interviewed were above 51 years, and majority of those in farming activities were in the range of between 41-50 years and 61 years. Studies(Morakile, *et.al*, 2021;Mokoele, Spencer, Van Leengoed, and Fasina, 2014)show that the average age of farmers in South Africa is about 62. From the focus group discussion conducted with the subsistence farmers,it was clear thatinadequate interest and poor image about farming by youths are reasons for derisory participation in rural farming. Results also show that about 63% of females and 33% of males were involved in subsistence agriculture in the area. Nevertheless, thisstudy does not showcase gender perspective and representation, but suffice to indicate that there were more femalerespondents during the interview as compared to male.The studies by Agholor (2019); FAO, 2011, asserted thatimproving gender equity in agriculture will translate into refining productive potentials amongst farmers and create a competitive environment for agricultural evolution, and increase growth-path in Sub-Saharan Africa.

Table 2. summary of socio-demographic characteristics of farmers in the study area

Variable (N = 330)	Frequency	%
Age of respondents:		
<20 years	16	4.8
20-30 years	26	7.9
31-40 years	43	13.0
41-50 years	105	31.8
51-60 years	65	19.7
>61 years	75	22.7
Total	330	100.0
Gender:		
Male	108	32.7
Female	222	67.3
Total	330	100.0

Level of education:		
No school	150	45.5
Primary	67	20.3
Secondary	97	29.4
Tertiary	16	4.8
Total	330	100.0
Farm size:		
<1 acre	168	50.9
1-5 acres	153	46.4
6-10 acres	9	2.7
Total	330	100.0
Farm experience:		
<5 years	85	25.8
6-10 years	51	15.5
11-15 years	62	18.8
>16 years	132	40.0
Total	330	100.0
Marital status:		
Single	186	56.4
Married	125	37.9
Divorced	6	1.8
Windowed	13	3.9
Total	330	100.0
Source of income:		
Salary	59	17.9
Grant	123	37.3
Pension	95	28.8
Other	53	16.1
Total	330	100.0

Subsistence farmers withtertiary education were about 5% while those who had primary education were approximately 21%. Most respondents had no formal education (46%), whereasthose with secondary education were about 30%. Majority of respondents who were cultivating less than one acre of land were 51%. However, farmers who had farm size of 1-5 acres were about 47%, while those cultivating 6-10 acres were 3%. Even though the size of farmlanddoes not indicate land deprivation, the result suggests that most subsistence farmers in the area have no access to sophisticated farming tools for cultivation as many appears satisfiedat their present levelof farming,not because it is desirable but for the reason of poor farming infrastructures. Finding show that about 57% of respondents were singlewhile 38% were married. About 2%were divorced and 4% were widow. Subsistence farmers who were living on social grant as off-farm income were in the majority (38%) while those in the category of salary, pension and other were 18%, 29% and 17% respectively.

Level of involvement in local markets

Table 1. Show subsistence farmers' level of involvement in local markets. The level of participation in farmgate marketing was moderately low ($\bar{X}$ 2.390). However, this result is

expected as most farmers often speculate that selling farm produce at farmgate market attracts very low prices. Furthermore, high level of involvement in roadside, village market and rural assembly markets recorded a $\bar{X}$ score of 2.669, 2.660 and 2.669, respectively. This result is substantiated by the discussion paper of Shaun *et.al.*, (2014), found that 80-90% of farm produce for subsistence farmers are sold at farmgate, roadside markets, village markets and rural assembly markets. The local markets are vital for trading most local farm produce by subsistence farmers.Majority of respondents are highly involved in the sale of farm produce in roadside, village market and rural assembly markets without value addition. The sale of farm produce without processing for market means low prices will be offered by consumers.

Table 3. Level of involvement in local markets

Markets (n=330)	Mean	Std dev.
Farmgate	2.390	0.639
Roadside	2.669	0.548
Village market	2.660	0.551
Rural assembly market	2.669	0.548
Inner-city market	1.430	0.811
Agents/speculators	2.030	0.905

Always' (3), 'Occasionally' (2), 'Not at all' (1).

Determinants of farmers' decisions to participate in local markets in the study area

Table 4 indicate the multinominal regression result used to determine farmers' decisions to participate in local markets. In the case of regression model with categorical dependent variable, computation of singleR^2statistics that has all characteristics of R^2 in the modelis impossible, so approximations are madeinstead (Nagelkerke,1991)and therefore, this study followed this approach.

In table 4, the Pseudo R^2 indicates a summary ofthe proportion of variance of the dependent variable which is associated with the predictor (independent) variables. With *Cox and Snell* (.518), *McFadden* (.536) and *Nagelkerke* R^2 of 0.696 result obtained, show that more of the variables were explained in the model and that the model fit the study (Nagelkerke,1991).The variables noted and discussedin Table 1 (description of the independent variables used in the multinomial logistics regression), were measured for their significance.

Farm size was significant with $P<0.016$ and positively related to the choice or decision to participate in local market. This result suggests here, that for every unit increase in farm size, there is 2.781increases in the log odds ofparticipation in local marketprovided that all antecedent variables are held constant.

Table 3. Multinominal regression result used to determine farmers' decisions to participate in local markets

Independent variables	B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
							Lower Bound	Upper Bound
Intercept	-.112	1.451	.006	1	.939			
Age	-1.894	1.106	2.933	1	.087	.151	.017	1.315

Level of education	.846	.944	.802	1	.371	2.330	.366	14.834
Farm size	2.781	1.152	5.827	1	.016*	16.141	1.687	154.419
Farm exp.	-1.278	.633	4.077	1	.043*	.279	.081	.963
Extension contacts	-.988	.489	4.078	1	.043*	.372	.143	.971
Membership of associations	-.401	.564	6.180	1	.013*	.246	.082	.743
Accessto credit	-.843	.458	16.206	1	.000*	.158	.065	.388
Distance to markets	-.356	.528	6.608	1	.010*	.258	.092	.725
Access to marketinformation	.088	.396	.050	1	.823	1.092	.503	2.372
Produce output	.340	.390	.758	1	.384	1.405	.654	3.018
Farm location	.407	.984	.171	1	.679	1.502	.218	10.336
Goodness-of-Fit:								
Pseudo R-Square:								
Cox and Snell	.518							
Nagelkerke	.696							
McFadden	.536							

This is consistent with the finding of Xaba, *et.al*., (2013), found that size of farmland under cultivation has a relationship to the choice of marketing channels in Swaziland. Farm experience was also significant with P<.043 and negatively correlated with the choice to participate in local market for the sale of farm produce. This suggests that for every increase in farm experience of respondents, the log odds of participation in the local market decreases by 1.278 times if all variables are held constant. This result is contrary to the researchers' expectation as hypothesised (table 1). Nevertheless, the result is corroborated by the study of Agholor (2016) who found that farm experience is related to decision making but negatively influence the choice to continue with irrigation scheme in Zanyokwe Eastern Cape, South Africa.

The contact with extension service personnel recorded a significant relationship with *P*<.043, but negatively related to participation in local markets. This result implies that for every unit increase in the number of contacts with extension services, there is 0.988 times decrease in the log odds of participation in local markets. On the contrary, however, extension services increase the level of awareness and plays a significant role for information dissemination, social networking amongst farmers and adoption of innovation (Agholor and Nkosi, 2020; Nyanga and Juma,2014). Membership of association showed a significant relationship but negatively influence participation in local markets with *P*<0.013 and *β*-.40. The implication here, is that for any proclivity intent of a farmer joining of an association, there is 0.40 times decrease in the log

odds of participation in local markets. The plausible reason for this result is that there are no formal market association instituted in the area. Nevertheless, membership of association transcends cooperation and social interaction, and cascading into sharing of ideas central to individual interest. The distance from farm to market was significant with P<0.010 but negatively influence participation in local market. This finding suggests that for every increase in distance, the log odds of participation in the local market decreases by 0.356 if all variables are held constant.

Farmers access to credits was significant with *P*<0.000, and negatively related to market participation with β-.843. The implication of this result is that, as access to farm credits increases, there is 0.843 times decrease in participating in local markets. This result contradicts the *priori* expectation, as indicated that access to farm credits increases participation in markets (Table 1). In the study of Agholor and Gama, (2020) on the perception of land reform in Reef, Nkomazi South Africa, found that inadequate access to credits was a major problem identified by land reform beneficiaries in the area. From the focus group discussion conducted in this study, it was discovered that most subsistence farmers in the area sell their produce on their own without involving speculators or third party. The reason is that majority prefer to sell their farm produce via avenues that will offer instant cash on delivery.

CONCLUSION

The study examined the factors affecting smallholder farmers access to local agricultural markets in Clau-Clau, South Africa. Random sampling method was used with an indication that no special treatment of groups in the sampled population. The structured and semi-structured questionnaires were used to gather information and were divided into two sections: the first part concentrated on socio-economic demographics of the smallholder farmers while the second part identified available markets, and the level of participation by smallholder farmers. Current literature on markets, factors affecting market access and extent of participation by smallholder farmers were reviewed to complement data variation and validity for detailed analysis of information. The descriptive statistics which embed the frequency, mean and percentages were used and the extent of smallholder farmer's participation in markets were measured on three points rating scale. The hypothesis on the influence of the socio-economic characteristics of farmers participating in market was tested using multinomial regression analysis.

The study found that farm size was significant and positively related to the choice or decision to participate in local market. However, farm experience,contact with extension services, membership of association, access to credits and proximity from farm to markets were the independent variables found to have significant relationship but negatively influence participation in local markets.

There is the need to encourage joint action to link subsistencefarmers to markets, be it local or formal markets. Encouraging networking for information sharing is important for agribusiness supply chain and marketing. The political will, social and institutional policies must be put in place by government to enhance exchange and distribution of goods and services within the value chain. Market facilities, infrastructures and food safety environment must be provided to avoid local consumers shifting from patronizing local markets. Local markets should be made attractive, with low postharvest losses,low stall tariffs to attract suppliers, traders, and buyers.

ACKNOWLEDGEMENTS

I wish to acknowledge UMP for the ethical clearance released for the purpose of this study, and MsNondumiso Princess Sambo for assisting with data collection.

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