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The role of cooperatives in empowering smallholder farmers to access markets: A case study of Eastern Cape and KwaZulu Natal cooperatives in South Africa

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Abstract

Smallholder farmers can benefit from market-oriented agriculture when they get support from various institutions and operate in organized groups such as cooperatives. Cooperatives have the potential to penetrate high value markets or better paying markets to improve their living standards. However, agricultural cooperatives often face a number of challenges in accessing better paying markets arising in part from the institutional factors and the emergence of complex supply chains in agriculture. Collective action has the potential to reduce transaction costs and improve bargaining power of farmers vis-a-vis the market. The objective of this paper was to evaluate the probability for South African agricultural cooperative to engage in collective marketing activities over time, given market and institutional characteristics. Using a sample of eighty-nine agricultural cooperatives from the Eastern Cape and KwaZulu Natal Provinces in South Africa, the analysis suggests that collective marketing faces challenges related to increasing competition. Empirical results also suggest that among South African cooperatives, those established in KwaZulu Natal and partly in the Eastern Cape Provinces and upon the voluntary initiative of farmers are more sustainable and have access to better paying markets. The results show that Non-Governmental Organizations supported cooperatives have a longer life span than Government controlled cooperatives.

Keywords: Smallholder Farmers, Cooperatives, Collective Action, Market Access

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1. Introduction

Agricultural smallholder producers in developing countries face a number of challenges as a result of changing economic, environmental, and socio-political conditions. According to Farina and Reardon (2000) smallholder farmers are faced with a number of challenges in the global agricultural economy but these challenges bring with them new opportunities. Smallholder farmers also face significant challenges that hinder their participation in new markets. Market imperfections in developing countries have caused smallholder farmers to suffer from lack of resources such as information asymmetry on prices, transaction costs and access to credit facilities in developing countries. Smallholder farmers are increasingly failing to access international markets because of the trade agreements that do not favor them while commercial farmers have a comparative advantage. Thus, in developing countries smallholder farmers are more likely to compete with their peers and farmers from neighboring countries for market access.

While most of the changes in agricultural and food markets are taking place in the developed countries, they have far-reaching repercussions for agricultural development efforts in developing countries (Kirsten and Sartorius, 2002; Kherralah et al., 2002). Lack of information on prices and technologies, lack of connections to established market actors, absence of input and output markets, and credit constraints often make it difficult for smallhoder farmers to take advantage of market opportunities. The tightening food safety standards in high income countries is causing new barriers to accessing these profitable markets (Augier et al., 2005; Brenton and Manchin, 2002; Unnevenhr, 2000). Some empirical studies find that the reorganization of the global food supply chains have led to a shift from smallholder production to agro-industrial production, thereby excluding smallholder farmers from profitable trading opportunities and resulting in negative welfare effects (Farina and Reardon, 2000; Maertens and Swinnen, 2009). High transaction costs faced by smallholder farmers due to their small scale aggravates these challenges, especially in quality conscious and niche markets like those in the developed countries (Poulton et al., 2005). Access to these markets often requires expensive third party certification, which in turn may be a barrier to smallholder participation (Barrett et al., 2001).

The problem of market access has also been due to lack of follow up investments by farmers and government, coordination problems among farmers and poor management of these farms. Smallholder farmers face enormous constraints in physically accessing markets. Smallholder farmers lack resources such as business and negotiating skills and the collective organization to give them the control to interact on equal terms with stronger market chain actors (Magingxa and Kamar, 2003). In addition, farmers need more training in more profitable and sustainable agricultural methods. Many of these farmers spend up to several months or more producing crops and have to wait almost as long for a return on their investment. Because it is difficult to enter these high value chains and this makes it difficult for the farmers to earn better incomes. Among these challenges institutional constraints have been noted to be responsible for failure to guarantee a stable and sufficient supply of agricultural products (Kirsten and Sartorius, 2002). Smallholder farmers have no guarantee that their produce will end up in a better paying market.

Nonetheless, agricultural cooperatives began to re-emerge as a possible solution that could promote market access for smallholder farmers in developing countries. These were strongly promoted and

supported by policy reforms envisaging a return of cooperatives as a way to improve the participation of smallholder farmers in emerging national and international markets (Bebbington, 1996).

Bienabe et al. (2004) contends that smallholder farmers can only overcome market failures through organizing themselves into cooperatives or farmer organizations. When smallholder farmers are organized they are able to penetrate both local and international markets. According to Ortmann and King (2007) acting collectively enables smallholders' farmers to be better positioned in the market. Collective action helps to reduce transaction costs for their market exchanges, obtain necessary market information, secure access to new technologies, and tap into high-value markets, allowing them to compete more effectively with large farmers and agribusinesses (Chambo, 2009). Producer groups can simplify long marketing chains by connecting smallholders directly to markets, bypassing various marketing intermediaries. Thus, forming such groups would allow smallholder farmers to commercialize and become competitive in high market value chains (Philip, 2003).

Although agricultural cooperatives have been growing slowly in South Africa and are expected to grow further, their contribution to improve agricultural commercialization appears still negligible (Bernard et al., 2008). In South Africa, most agricultural cooperatives serve smallholder farmers to procure improved and subsidized farming inputs from the state, private parastatals and non-governmental organizations (NGOs) (Meinzen-Dick et al., 2009), but only some of these cooperatives assist farmers to improve output marketing.

However, in most cases in South Africa commercialization of these smallholder farmers is limited. Smallholder farmers depend on these organizations for both innovative and entrepreneurial skills to compete with other farmers (Bernard et al., 2008). A widespread opinion is that public interventions to promote the formation of rural cooperatives are often too invasive, creating collective dependency rather than collective entrepreneurship. In developing countries such as Zimbabwe and Zambia that got their independence much earlier than South Africa, most cooperatives were initiated by people who were not employed and who were not educated at all but coming from disadvantaged communities. And like all other businesses it is under these circumstances that they had the least chance of success (Philip, 2003). But for cooperatives and group projects, the problems were often compounded. In most cases policies for cooperatives were designed without consulting the intended beneficiaries thus according to Develtere et al. (2008) to satisfy the agenda of donors. Top-down interventions tend to attract opportunistic behavior and subsistence farmers are eager to extract subsidies rather than embark in marketing activities.

Chambo et al. (2007) illustrates how rural cooperation in South Africa can be traced back from the 1980s and 1990s where cooperatives were introduced to support workers and these cooperatives emerged as a result of cooperative movements in the neighboring countries such as Mozambique and Zimbabwe. The institutionalization of agricultural cooperatives came only after the responsibility for cooperatives in government was transferred from the Department of Agriculture to the Department of Trade and Industry (DTI). The Cooperative Enterprise Development Division has now a unit under DTI according to Ortman and King (2006).

While cooperatives may be a panacea to rural development of smallholder farmers in South Africa and the rest of the developing countries, the role of government, private parastatals and NGOs need to be assessed in

detail to assess if their contribution plays an important role in improving market access and incomes of farmers. According to Shiferew et al. (2006) a number of agricultural cooperatives collapsed as a result of uncertainty in South Africa and many other developing countries. This has been blamed on government failure to fully support smallholder farmers in South Africa, especially the black farmers who received land from the government after the land reform programmes. Therefore, this study investigates the role of cooperatives in enhancing market access in both local and international markets.

2. Agricultural cooperatives in South Africa

Experiences gained particularly in East Asia and East Africa indicates that cooperatives are among the institutional arrangements that can help smallholder farmers to overcome the numerous constraints they are faced with. The different agricultural cooperatives have great potential to improve productivity in the poverty stricken smallholder sector as well as enhance market participation by farmers (Birthal et al., 2005). Encouraging farmers to act collectively is therefore seen as one viable strategy for addressing constraints, especially in the smallholder farming sector (Shiferaw et al., 2006). Although cooperatives have had a calamitous history, especially in Africa, evidence indicates that they have the potential of linking farmers to markets by reducing transaction costs (Develtere et al., 2008). Improving smallholders' access to markets is considered essential to enhance their income and increase the number of marketing options available to them (Markelova et al., 2009). When farmers get good markets their marginal income will be high and they will be able to acquire production inputs needed in producing in abundance and ensures availability of food and improves rural livelihood.

Farm cooperatives were introduced in sub-Saharan Africa (SSA) during the colonial period for the purpose of promoting production of cash crops by peasant farmers (Hussi et al., 1993). After independence, many governments as well as donors (Private parastatals and NGOs) promoted cooperatives and other rural organizations as a potential source of decentralized grassroots participation in agricultural credit, input and commodity markets (Lele and Christiansen, 1989; Hussi et al., 1993). Their performances were mixed. For example, in Kenya semi-autonomous agencies such as the Kenya Tea Development Authority (KTDA), and the coffee and dairy cooperatives were important to the growth of smallholder production, while some parastatals and cooperatives showed poor performance of the cooperatives (Shiferaw et al., 2006). The poor performance was attributable to technological problems and poor management by the farmers (Wolf, 1986; Lele and Christiansen, 1989). Generally, the performance of farmer cooperatives in relation to poverty reduction and provision of essential services has not been assessed to its full potential in most developing countries (Hussi et al., 1993; Akwabi-Ameyaw, 1997).

Most cooperatives funded government operated as service cooperatives rather than as business enterprises or entities owned and managed by the farmers (Shiferaw et al., 2006). They were not allowed sufficient marketing margins to cover their operational costs and could, therefore, not grow and become commercial and viable farm businesses (Philip, 2003). As a result, this compromised their inherent character as farmer controlled organizations which in turn discouraged farmer's participation and eroded confidence

in the leadership of the cooperatives. With structural adjustment prgrammes and economic reforms, many of the service cooperatives lost their special protection from the state, which further reduced their viability in the ensuing competitive environment (Meinzen-Dick et al., 2009).

The World Bank (1995) states that for cooperatives and rural organizations to be effective in serving a broad set of socio-political and economic objectives of smallholder farmers, a new genre of policies and institutional arrangements are required to facilitate their transformation from public sector service providers to private sector enterprises with clear business plans. With hindsight, farmer organizations tend to succeed only when farmers can manage them on their own with minimal government involvement. Literature on cooperatives has highlighted that farmers participate actively in decision making at every stage of the process when they are involved and when there is less interference from government and their cooperative activities are profitable.

Not so much is known about the development of smallholder farmers in South Africa into cooperative farming. Literature on cooperatives in South Africa and their development dates back to the 1910s when the first cooperative in the Orange Free State was established, exactly three years after the formulation of the 1908 South African Cooperatives Act (Phillip, 2003). The Land bank was established as a development finance institution in 1912 by the Government of South Africa to assist farmers with agricultural finance and resources (Barrett et al., 2001).

Philip (2003) highlights that South Africa's agricultural cooperatives focused on input supplies and joint marketing of production and also established processing cooperatives such as in the wine and spirits sectors. The resultant cooperatives became a powerful lobby for agriculture and they held monopoly powers to key agricultural sectors and they were able to influence Marketing Boards through the regulations of prices until after 1994 (Pauw, 2007). In the late 1990's, many of the cooperatives initiated processes to convert to limited liability companies. The Minister of Agriculture took legal action to attempt to stop cooperatives from being closed down as the political atmosphere was tense as these were regarded as threat to the then government (Tshuma and Boyana, 2013). The political turmoil in the early 1990s gave black cooperatives a number of challenges as these were suspected to be against the apartheid policies. Any non-white people that came together were considered dangerous to the apartheid regime thus most of these cooperatives were operating at a slow scale or were completely shut down. Only the white minority cooperatives were operating at the expense of other races in South Africa (Tshuma and Boyana, 2013).

There is strong justification for the formation of cooperatives in South Africa and the rest of sub-Saharan Africa. Farmer organizations have a potential to play a critical role in both the delivery and coordination of services to smallholder farmers in terms of input and output markets (Dorward et al., 2002). They can facilitate collective marketing of agricultural produce that will help reduce transaction costs related to the marketing of agricultural inputs and small marketable surplus emanating from a large number of widely dispersed small producers. Collective marketing allows smallholder farmers to spread the costs of marketing, enhance their ability to negotiate for better prices, and improve their market power (Shiferaw et al., 2006). However, for these cooperatives or organizations to be beneficial to farmers, governments have to provide complimentary public goods or support services that would empower small producers to participate in

markets (Kelly et al., 2003; Birthal et al., 2005). On the other hand the role of NGOs has been seen to be instrumental by other countries such as Malawi, Kenya, Madagascar and Ethiopia in promoting these cooperatives. They are responsible for linking smallholder farmers with supermarkets in European (EU) and United States of America (US) markets (Reardon and Berdegue, 2002).

A study by PLAAS in Limpopo Province discovered that most smallholder farmers participate in formal and informal markets. Farmers faced inadequate resources such as irrigation and infrastructural equipment to operate on a large scale like commercial farmers. The survey highlighted that smallholder farmers participate in multiple markets to get their produce sold thus reducing risk of losing their products from price volatility and quality differentiation (Sikwela, 2013). However, NGOs and private parastatals in the province have managed to bridge the gap between smallholder farmers and supermarkets. The NGO managed to boost the incomes of smallholder farmers, not through handouts, but by selling them tools to improve their output and building them a pack houses in Vhembe in Limpopo Province (Chikazunga and Paradza, 2012).

Chikazunga and Paradza (2012) highlight that the Department of Agriculture, Forestry and Fishers (DAFF), the Department of Trade and Industry (DTI), and the Sector Education and Training Authority (SETA) have come up with support systems for smallholders farmers in an effort to assist farmers with farming activities. Value chain integration has become so complex that smallholder farmers are struggling to find production and marketing support in ways that are appropriately aligned with their production systems and capacities. Thus, farmers are forced to sell their produce to different market segments which are not profitable and because farmers lack sufficient knowledge and there is little ongoing support for infrastructural development.

The level of commercial success of these cooperatives dwarfs any other form of cooperatives in South Africa and they continue to play an important role in providing technical and infrastructural support to their members in accessing profitable markets both locally and international.

3. Study area

The data used were collected in the Eastern Cape (OR Tambo and Amatole) and KwaZulu Natal Province (UMkhanyakude and UMgungundlovu) through semi-structured questionnaires from cooperative chairpersons or members. Eighty-nine agricultural cooperatives were randomly selected because of the nature of agricultural activities taking places on the farms and the farms involved in market access. Four districts were selected based on an analysis of the following measures across the districts in the two provinces, the numbers of black households involved in agriculture, the numbers of households in which adults experience hunger, the rates of poverty and food insecurity and whether the districts are cabinet approved priority deprivation districts.

The sample does not claim representativeness of the national agricultural cooperative system as discussed by Phillip (2003). The survey was conducted between 2012-2013 and a follow-up 2015 to increase the sample size from 50 to 89 cooperatives for this study and each cooperative was surveyed once using a

semi-structured questionnaire. The latter was designed with the intention to capture the heterogeneity in cooperative structure and conduct of smallholder farmers in these two provinces.

For these reasons, the data used in this study describes the establishment or re-establishment (for cooperatives originally established during the early 1990s in South Africa and the development of collective marketing in the period between 1990s and 2000s and so forth. Consequently, the age of cooperatives, measured from establishment (for cooperatives founded after 2006) or re-establishment (for cooperatives founded after 2000), ranges from a minimum of one to a maximum of 12 years, with an average of 8 years. Fifty-two percent of the cooperatives were established or re-established on the initiative of farmers, as opposed to external initiatives by governmental or non-governmental support.

4. Empirical model

The aim of this study is to try measure the probability for agricultural cooperatives to engaging in output marketing activities over time, given the market and governance environment in which they operate in South Africa. Smallholder farmers in South Africa market their produce as individuals or producer organizations. Transactions costs which include negotiation and bargaining skills among cooperatives affect market access. A probit model was used to estimate the probability of smallholder farmers in engaging in marketing activities of not (Claire and Smith, 2006). The empirical model is presented below:

$$\gamma_i = \alpha_0 + \alpha_1(m_i * x_i) + \alpha_2(m_i * x_i^2) + \alpha_3\ (m_i * x_i^3) + \alpha_4(b_i * x_i) + \alpha_5(b_i * x_i^2) + \alpha_6\ (b_i * x_i^3) + \alpha_7(d_i * x_i) + \alpha_8(d_i * x_i^2) + \alpha_9(d_i * x_i^3) + r_i + \varepsilon_i \qquad (1)$$

where the dependent variable, γ, is equal to one when a cooperative i engaged in output marketing activities during 2010-2015, and equal to zero when it did not. In order to capture the cooperative business cycles in the previous years, the independent variables in Equation 1 include cooperative age, x, as well as its squared value, x^2, and cubic term, x^3. Since cooperatives in South Africa develop from business cycles which involve company registration for beginners, these variables are expected to explain γ, with x^2 showing opposite sign in respect to x and x^3.

In order to distinguish the effect of different markets and institutional arrangements on the development of cooperatives on South Africa, x, x^2, and x^3 are interacted with two indicators: (1) a dummy, m, for cooperatives established on farmers' initiative (m equal to one), as opposed to cooperatives originated from top-down interventions by the government or NGOs (m equal to zero); and (2) a dummy, b, for cooperatives whose initial chairman was appointed by the government (b equal to one), as opposed to cooperatives with an initial chairman chosen by the farmers (b equal to zero), to determine sustainability of the project the distance to the market is measured by d, where (d equal to zero for easily accessible markets) where x, x^2 and x^3 are interactive terms showing variability in distance to the market.

Cooperatives or group farming in South Africa requires formal registration so that they can receive support from either the state or NGOs. This initiative is normally comes from small group of members, under the conducive support of the state and those that are initiated by NGOs are centered on a ready market for

their produce. For this reason farmers' initiative, m, is expected to have a positive influence on collective marketing in 2010-2015, γ. Part of the literature discussed in section two suggests that governmental interference, d, has a negative impact on collective marketing. However, when cooperatives are formed by poorly educated smallholders the intervention of the government could also be necessary to promote collective marketing but more often than not those that are supported by NGOs tend to have a longer life span because of the support package they receive. The empirical model (Equation 1) includes also a set of three dummies, d, indicating the different districts in which a cooperative *i* operates (OR Tambo, Amathole, UMkhanyakude or UMgungundlovu). While these cooperatives play a significant role in contributing to household food security and income, their developmental stage vary depending on how they were established and by whom. In the Eastern Cape Province most of these cooperatives or groups of farmers are supported by the state but those in KwaZulu Natal most of the smallholder farmers have support coming from government and NGOs.

The empirical model proposed in equation 1 could undergo econometric problems inherent to the use of cross-sectional data and these should be addressed before interpreting the results. In most cases, when econometric models are based on data collected at one point in time, as in this case, it is difficult to ascertain that right hand side variables cause variations in the left hand side variable rather than the other way around (endogeneity) (Verbeek, 2004). However, causality does not seem to be a problem in this model since age of (existing) cooperatives, and lagged variables (referring to cooperatives' establishment) are interacted in the model. An additional concern relates to the use of cross section data is heteroskedasticity, here controlled by estimating the model with robust standard errors [1].

5. Results and discussion

5.1. Demographic information

Demographic characteristics of respondents are provided in Table 1. The average age of cooperative heads was 53.3 years with most cooperative members having attained primary and secondary education in all the districts (formal education). The proportion of cooperative members with post primary education was higher for Amathole (EC) and UMgungundlovu districts (KZN). In this study there were very few cooperative members without education in OR Tambo, UMkhanyakude and UMgungundlovu districts. Education level is slightly higher for Amathole and UMgungundlovu districts while the other districts have lower educational status. Most cooperative members were male headed, the proportion being slightly higher in the Eastern Cape Province compared to KwaZulu-Natal Province. Literacy is high in both provinces since there are very few people without education except for Amathole district among the cooperatives that were interviewed in this study, implying that they were able to independently access written information as shown in Table 1.

The results that are presented in Table 1 show that there were a larger proportion of male respondents (55%) as opposed to females (45%). These results show a fair gender distribution among the farmers

[1] *Heteroskedasticity occurs when the variance of the random error term is not constant across observations.*

implying that any development strategy for the farmers in the area will benefit males and females almost equally. In order to characterize the different types of smallholder farmers in the two provinces, the sample population was divided into four groups in terms of the districts the farmers are located. Table 1 presents the results of the analysis of significant intrinsic differences among these cooperative members operating in the two different provinces.

Table 1. Demographic characteristics

	Eastern Cape				**KwaZulu Natal**			
Variable	**OR Tambo**		**Amathole**		**UMkhanyakude**		**UMgungundlovu**	
N respondents	**17**	**%**	**28**	**%**	**22**	**%**	**22**	%
Gender (Male)	7	41.2	23	82.1	16	72.7	5	22.7
(Female)	10	58.8	5	17.9	6	27.3	17	77.3
No education	13	76.4	1	3.6	5	22.8	1	4.6
Primary education	2	11.8	4	14.3	13	59.0	2	9.1
Secondary education	2	11.8	15	53.6	4	18.2	17	77.3
Tertiary Education			9	32.2			1	4.6
Farmer characteristics	**Mean**	**SE**	**Mean**	**SE**	**Mean**	**SE**	**Mean**	**SE**
Age (Years)	50.91	1.32	54.5	1.23	53.6	0.98	54.3	0.87
Male (> 60 years)	0.26	0.20	0.47	0.01	0.36	0.32	0.12	0.42
Male (45-60 years)	1.02	0.02	1.03	0.21	0.56	0.24	0.45	0.17
Male (30-45 years)	0.06	0.43	0.37	0.05	1.22	0.21	1.30	0.99
Male (18-30 years)	0.11	0.09	0.08	0.21	1.08	0.30	0.58	0.35
Female (> 60 years)	1.16	0.24	1.41	0.08	1.10	0.41	1.04	0.41
Female (45-60 years)	0.82	0.43	0.09	0.02	1.68	0.23	0.15	0.16
Female (30-45 years)	1.24	0.72	1.96	0.23	0.82	0.41	0.23	0.04
Size of farm	6.30	0.23	18.4	2.46	3.24	0.62	2.65	0.22
No of years in farming	9.41	0.13	13.2	2.03	14.2	0.32	9.62	0.36
N respondents	**17**		**28**		**22**		**22**	

SE = standard error

There are few differences between farmers in terms of their farm-characteristics as shown in Table 1. The farmer's age, size of the farm, and number of years in farming have no significant impact on the variability between farmers located in the Eastern Cape and KwaZulu-Natal Provinces. The age of the farmer is thought to improve farming practices of the farmers and exposure to agricultural markets, whereas older farmers are

oriented towards better paying markets since they possess more experience in farming. However, the standard error (SE) for Amathole and OR Tambo was quite high implying that there was high variability in tier ages as compared to the other districts. Table 1 shows that most of the farmers in the two provinces are educated and those that have not attended school are few. The level of education was investigated to determine the human capital level of farmers and the ability to interpret information. Thus, according to Montshwe (2006) people with higher educational levels are more able to construe information. Thus, education levels affects market information interpretation and hence, market participation level of farmers and understanding of both technical and management skills. OR Tambo has 65% of its people not being educated, while Amathole, UMkhanyakude and UMgungundlovu have 5%, 25% and 5% respectively. Amathole and UMgungundlovu districts have a large number of people who have attained secondary education.

5.2. Differences across cooperatives

Table 2 compares differences in the establishment of cooperatives that were engaged in collective marketing between 2010 and 2012 and those that did not. Table 1 suggests that marketing cooperatives are mostly found in KZN and a few in the Eastern Cape regions. Table 2 suggests that cooperatives established upon members' initiative, with an initial chairman appointed by the government and local communities or agricultural extension officers, and are more likely to engage in collective marketing than those appointed by group members. However, the analysis presented in Table 2 could be affected by selection bias due to the presence of cooperatives that did not engage in collective marketing because they were recently established and did not have sufficient time to set up marketing services.

Table 2 presents the results of the probit estimation, looking at the exposure of cooperatives and development of smallholder farmers in rural areas of South Africa. The results suggest that the local municipalities of OR Tambo and UMkhanyakude offer better environments indeed for agricultural cooperatives to embark in collective marketing activities. Cooperatives in these two local municipalities have higher probability to engage in collective marketing than in the other two local municipalities (Amathole and UMgungundlovu). These findings are supported by the frequent complaints (sometimes degenerating into misunderstanding acts) of smallholder farmers in the Eastern Cape (OR Tambo and Amathole districts) and two in KwaZulu Natal provinces (UMkhanyakude and UMgungundlovu districts) about the political environment, in favor of KwaZulu Natal smallholder farmers than those in the Eastern Cape Province.

In both provinces the cooperatives range from food and cash crops to livestock which includes both small and large livestock. The number of founding members can vary widely in both provinces ranging from 3-70 members, and on average amounts to 18 farmers. In 2010, the average cooperative counted 184 members. The average growth in number of members from establishment to 2010 is estimated at 53% of the total number of cooperatives investigated. In most of the cooperatives the initial chairman was appointed by the government which is through the extension officers in these districts. Sixty percent of the cooperatives engaged in collective marketing, at least once, in the year before the survey. The sample size consisted of agricultural marketing cooperatives who were involved primarily in cereals, vegetables and fruits.

Empirical findings in Table 3 reveal that there is a significant difference at 5% between cooperatives that are old and those that are located in distant areas from the markets. Table 2 shows that cooperatives that are old have better experience in accessing markets than those that are new because of the exposure (knowledge) from agribusiness and entrepreneurial skills over years. Another important finding from these results is that the regions where the cooperatives are situated play a very important role. This is basically because of level of support from government, private parastatals and NGOs. The climate in these regions also plays a vital role in terms of agricultural potential for smallholder farmers in both provinces. The KwaZulu Natal province is well endowed with agricultural potential for farmers as compared to the Eastern Cape, thus production in KwaZulu Natal is much higher than the Eastern Cape Province.

Table 2. Differences across cooperatives, Eastern Cape and KwaZulu Natal Provinces

Number of Observations N=89	**Cooperatives that are not engaged in collective marketing**	**Cooperatives that are engaged in collective marketing**
Gender of Chairperson (Dummy)	0.01(0.02)**	0.12(0.01)*
Educational level of the Chairperson (Dummy)	0.08(011)*	0.03(0.02)**
Age of the Chairperson	0.35(0.02)**	0.03(0.28)***
Number of years in farming	0.45(0.25)	0.03(0.02)
Cooperative registration	0.27(0.38)**	0.23(0.34)**
Number of years the cooperative was established	0.36(0.51)*	0.11(0.43)*
Coops established on farmers' initiative (dummy variable)	0.01(0.25)*	0.42(0.27)*
Cooperatives in Amatole (dummy variable)	0.15(0.42)**	0.03(0.33)**
Cooperatives in OR Tambo (dummy variable)	0.17(0.37)	0.12(0.43)**
Cooperatives in UMgungundlovu (dummy variable)	0.41(0.40)*	0.02(0.24)*
Cooperatives in UMkhanyakude (dummy variable)	0.42(0.56)**	0.27(0.41)**

Note: *Standard deviation in parenthesis (), *, **,*** indicate statistical significance at 1, 5 and 10% respectively.*

The distance to the market was calculated on the number of kilometers to the nearest market. Farmers that were found to be located in distant markets had very little market participation as compared to those that were located to nearby markets. In this case, most cooperatives supported by NGOs performed better as they were directly linked to both local and international supermarkets.

Table 3. Endogenous and exogenous variables explaining market participation (Probit)

Dependent variable: dummy for cooperatives that engaged in collective marketing in the last year (2010-2015)	**Probit estimation**	**Marginal effects**
Cooperatives established on farmers' initiatives		
Cooperatives age	-0.86 (0.20)*	-0.27 (0.68)*
Cooperatives age^2	0.57 (0.15)	0.56 (0.20)
Cooperatives age^3	0.42 (0.31)**	0.02 (0.44)**
Cooperatives with 1st chairman selected by farmers		
Cooperatives age	-0.05 (0.18)	-0.37 (0.04)
Cooperatives age^2	0.33 (0.37)**	0.18 (0.59)**
Cooperatives age^3	0.65 (0.01)	0.20 (064)
Training and technical skills received by Chairpersons (Dummy)	0.01(0.12)	0.02(0.36)
Business support skills received by Chairpersons (Dummy)	0.01(0.05)	0.36(0.01)
Extension skills received by Chairpersons (Dummy)	0.05(0.01)	0.12(0.25)
Distance to the market		
Distance to the market	0.00(0.41)*	0.03 (0.42)*
Distance to the market^2	0.31 (0.95)**	0.26 (0.10)**
Distance to the market^3	-0.10 (0.01)	-0.74 (0.01)
Spatial effects		
Cooperatives in Amathole[a]	-0.11 (0.17)	-0.00 (0.41)
Cooperatives in OR Tambo[b]	0.33 (0.56)*	0.12 (0.71)*
Cooperatives in UMkhanyakude[c]	0.20 (0.65)*	0.31 (0.01)*
Number of observations = 89	**Correctly classified obs. = 77.6%**	
Log Pseudo likelihood = -292.08	**Pseudo R^2 =0.582**	

Spatial effects showing a, b, and c dummy variables for the location of these cooperatives

*Note: Standard errors in parenthesis (). *, ** indicate statistical significance at 5 and 10% respectively*

It is important to note that the standard errors in Table 3 are based on a procedure called heteroscedasticity robust standard errors or White-Huber standard errors. This means that the variance of the errors in the regression model are constant. This implies that the regression model estimates of the coefficients become stable and the standard errors for the coefficients are not wildly inflated. The results above show a high R squared value of 0.582 as expected. This showed how the variables are significant to the regression model. Thus the results are robust and significant in explaining the model and its coefficients with regard to explain market access of smallholder farmers. Contrary to the conventional view that local markets fail to source produce from smallholders, for example, SPAR and Pick 'n Pay do undertake local procurement largely from smallholder farmers. Smallholder farmers can now sell their produce to local supermarkets though the challenge comes about maintaining consistent supply and quality (D'Haese and Van Huylenbroeck,

2005). Of which NGOs and Private parastatals try to bridge this gap for smallholder farmers to access these profitable markets in rural areas of South Africa.

Table 3 shows that farmers' initiative is significant in explaining the probability for a cooperative to be engaged in collective marketing than those that are government orientated cooperatives. Governmental interference in cooperative management is insignificant in explaining collective marketing probability. However, the role of NGOs has a positive relationship with collective marketing as shown in Table 3. Thus, Maertens and Swinnen (2009) also approve that smallholder support is required for these farmers to access better paying markets. .

The support by external organizations has a very significant impact on collective marketing over time. It is clear that cooperatives established upon farmers' initiative are a more sustainable form of business than cooperatives established on the basis of top down initiatives (by either the government or NGOs). But the role that the NGOs play in providing market access is significant when compared to the role played by government. NGOs provide basic skills that enhance farmer's skills to be able to produce and market their produce. NGOs tend to link farmers with better paying markets when compared to government. This finding is largely supported in development and agri-business literature, which generally recognizes the voluntary and active participation of farmers as a key indicator of commitment to collective entrepreneurship. The literature appears to be fairly divided on the issue of public interference in cooperative management and non-governmental organizations. Empirical results suggest that governmental interference in cooperative management has no significant impact in promoting collective marketing activities.

6. Conclusions and implications

Smallholder farmers in developing countries can, in theory, sell their products to several types of markets: local (rural), emerging urban, regional and international. Of these, local markets are the easiest to reach due not only to logistical differences since transportation, quality standards, and scale issues are less of a concern at the local level, but also because of less competition from larger domestic and international producers.

Literature on smallholder farmers in South Africa has come to the conclusion that farmers have formed various forms of associations (or cooperatives) to solve their socio-economic problems. Some of these problems being institutional and technical challenges in accessing different markets. Agricultural cooperatives are seen as an institutional solution to support the livelihood and commercialization of smallholder farmers. However, this study suggests that agricultural commercialization through cooperatives faces a number of challenges in South Africa, there is great need of external support from both NGOs and Private parastatals and that South African cooperatives cannot always sustain collective marketing activities over time unless some internal problems such as free rider or internal conflicts issues are addressed. Farmers also require support from financial institutions such as banks or through bootstrapping which is a highly creative way of acquiring the use of resources without borrowing money or raising equity financing from traditional sources (Neeley and Van Auken, 2009).

Collective action seems to be more sustainable in KwaZulu Natal and a few in the Eastern Cape regions where market and/or governance conditions are more favorable than in other South African provinces. Furthermore, collective marketing activities appear to be more sustainable in cooperatives established on the voluntary initiative of farmers, than in cooperatives formed by top-down interventions (by the government or NGOs). External or exogenous interventions increase the probability for a cooperative to embark on collective marketing at an initial stage. However, collective competitiveness decreases rapidly in cooperatives formed by the government than those formed by NGOs.

Cooperatives founded on the voluntary initiative of farmers are instead less likely to engage in collective marketing at an early stage, but they are more likely to sustain these business and entrepreneurial activities over time. Findings from this study also show that the direct interference of the government in cooperative management brings no clear benefits to collective competitiveness.

Support from the government to agricultural cooperatives should avoid direct interference with establishment and management processes, but it should rather focus on building managerial capacity, so as to prepare cooperative members to confront the challenges coming from the market place. Members should be trained on business, logistical and technical skills to fit in these high value chains. Further research is needed to identify good managerial practices to be applied by different typologies of cooperatives in different market environments.

This study shows that markets access plays a very important role is smallholder farming. Market access improves the productivity of subsistence agriculture as it serves two purposes which include alleviating food deficiency at household level of the rural population and improving the incomes of farmers. In South Africa there four retail chains (Shoprite-Checkers, Pick and Pay, SPAR and Woolworths) which purchase products from smallholder farmers. They dominate the fresh produce markets and have displaced the National Fresh Produce Markets. Supermarkets tend to look for suppliers who can supply quality produce all the time. Restructuring processes or vertical integration has caused supermarkets to dominate fresh food markets and exclude smallholder farmers in the mainstream marketing channels of South Africa and other developing countries thus smallholder farmers cannot compete on a global scale.

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