Determinants of Farmer's Participation in Farmers' Associations: Empirical Evidence from Maputo Green Belts, Mozambique

Tomas Adriano Sitoe[1*] and Afonso Sitole[2]

[1]*Mozambique Agricultural Research Institute, Center for Socioeconomic Studies, P.O.Box 3658 Maputo, Mozambique.*
[2]*Department of Plant Health, Ministry of Agriculture and Food Security, IIAM Headquarters P.O.Box 3658 Maputo, Mozambique.*

Authors' contributions

This work was carried out in collaboration between both authors. Author TAS designed the study, managed the literature searches performed the statistical analysis. Authors AS managed the literature searches and analyses of the study wrote the first draft of the manuscript. Both authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Currently, the creation of farmers' association has been suggested as an instrument for improving farmer's well-being in developing countries, either to its potential contribution to markets access as well as by strengthening dissemination of information between farmers. However, most urban agriculture studies deal with production and marketing. Few studies analyze the determinants of producers' engagement in farmers' associations. Therefore, the study has evaluated the determinants of producer's participation in farmers' associations in Maputo green belts, Mozambique. The random sampling technique has been used to collect data from 126 smallholders, of which 63 are the members of farmers' association. A log it regression model has been used for quantifying the factors influencing farmer's decision to affiliate on farmers' association. The results of this study indicate that the variables with more influence on farmer's decision to affiliate on

_____

*Corresponding author: E-mail: sitoetoms@yahoo.com;

farmers' association are: gender, age, household size, and household income. Men are more likely to become members of farmer's associations than women. The results also suggest that farmers outside farmers' association have higher incomes and apparently have little interest for being affiliated to farmers associations because they can self-finance their agricultural activities. Access to credit and the size of cultivated area are not significant, however, the probability associated with the odds ratio for these variables have positive effects. The study recommends the implementation of agricultural programs and policies that encourage young farmers especially those with larger areas, and incomes to participate on agricultural and marketing associations.

1. INTRODUCTION

The advent of the Industrial Revolution, the world crisis and growing unemployment led the artisans to seek other ways of obtaining their livelihood through their work, hence the first associations emerged. Since then, forms of associations have evolved and spread throughout the world, collaborating with the development of societies [1]. At present, associativism and the co operativism constitute models of farmers' organization that are increasingly encouraged by both the Government and Non-Governmental Organizations (NGOs) as well as by the private sector. Co operativism originated from small organizations of European workers and peasants who sought mutual help for the common benefit of solving aggravated problems from the 19th century (Duarte, 1986).

Agricultural Farmers' Associations and Agricultural Farmers' Cooperatives are gaining relevance because they are believed to provide the way for the competitiveness and insertion of producers in the market [2]. Farmers' organizations have been suggested as a tool to improve the living conditions of farmers in poor countries, both by improving their market situation and enhancing the dissemination of information [3].

Associativism is related to social capital, since it is from this that the associations develop [4]. capital refers to the set of social relations in which an individual is inserted and that helps him achieve objectives that would be unattainable without the existence of such relations. Social capital is found in relationships between individuals, and the existence of social capital increases the resources available to individuals who are immersed in such relationships [5].

While associations may have positive impacts on communal social ties, introducing a farmer association in rural areas where a majority of the community is dependent on farming for income and livelihood, may also change group dynamics in a less desirable way and possibly effect social ties between association members and non-members negatively According to Lane participation is risky because it challenges local power structures [6].

In Mozambique, the cooperative creation process observed several phases. In the colonial period, cooperatives were characterized by organizations of a white minority as a means of obtaining support and tax exemptions and thereby enabling the development of the class of the small producers of the white race. Prominent in the colonial period were the cooperatives of banana exporters, of livestock and potato production. In the 1950s the agronomist Homero Ferrinho, concerned with the development of "indigenous" communities, advocated the establishment of cooperatives of poor peasants, particularly women, as a solution for rural development. It is due to him the constitution of the first cooperatives that emerged in the Limpopo River Valley [7]. Years later the Burgos priests and the Capuchins of Puglia developed similar experiences with the peasants of Manica, Sofala and Zambézia. Among these priests was the Farther Prosperino, who went on to lead the largest non-governmental organization in the country, the National Union of Co operatives. Ferrinho and Prosperino saw in co operativism the key to the development of rural communities.

In the post-independence period with the massive abandonment of production units by the settlers, the current regime inherited co operativism but with a view to developing rural regions and creating the well-being for all. In May 1975, the FRELIMO congress III officialized and defined the development guidelines that favored collectivization through cooperatives in state farms. After the officialization of the cooperatives, the Office for the Organization and Development of Agricultural Cooperatives was set up to promote better exchange among cooperatives and encourage unity among them, to coordinate

the use of resources and staff, to encourage the formation of associations of peasants [8].

In theory, the model implanted in the post-independence period considered co operativism as the way to involve the peasants in the productive and social collectivization. The adhesion to the associativism, the voluntary work and/or community, among other measures imposed by the government, were ravaged/hampered by the discontent social actors, which in a way undermined the possibility of achieving the desired results [9].

After several years of independence, the State was pressured by associative movements that were increasingly developing in the country. It (the State) created Decree-Law no. 2/2006 of May 3 that establishes the legal framework for the recognition of agricultural associations as a form to bring together the individual efforts of farmers and to improve their organization and link them with other sectors of the economy and society. In creating this legal instrument, Mozambican State created more conditions for the emergence of more associations throughout the country, thus revealing its importance in boosting agricultural production and trade.

Vegetables [1] are among the main food crops, generating income, employment and rural development of national agribusiness. In Maputo green belts of Mozambique, especially vegetables represent a source of income for people living in outskirts of urban areas and contribute to a large extent in the supply of fresh produce to markets and supermarkets in Maputo and Matola towns.

A comparative assessment of fresh produce production and marketing systems in east and southern Africa suggests that, while fresh produce may provide the greatest opportunity of any set of crops for land constrained poor smallholder farmers, they confront a series of often intractable constraints that make fresh produce production at commercial scale difficult to achieve and quite risky [10].

In Mozambique, according to official data from the Agricultural Survey (TIA, 2014), only 3.6% of farmers belong to Farmers' Associations. According to Sitoe [11], the fact that medium scale farmers having apparently little interest in joining agricultural associations, as well as little

constrained cash and other assets in the Maputo Green Belts, raises the question about the real importance of agricultural farmers' associations for agricultural development [2].

Most urban agriculture studies deal with production and marketing of agricultural produces. Few studies analyse the determinants of producers' engagement in farmers associations. This field of knowledge is still incipient. Traditionally, economic analysis of farmers' decisions focuses on imperfect information, risk, uncertainty, institutional constraints, human capital, availability of inputs and infrastructure as potential explanations for decisions.

The general objective of this study is to evaluate the determinants of producer's participation in farmers' associations in Maputo green belts. This will contribute for the provision of the basis for policy and investment recommendations for improved performance. The information may be useful for academicians, scientists, planners, and NGO personnel in Mozambique as well as many other countries of the world.

2. METHODOLOGY

Due to its geographical location, the green belt of Maputo play an important role in the production and supply of vegetables to the cities of Maputo and Matola (the capitals of Mozambique and Maputo Province, respectively). A variety of vegetables are produced in Maputo green belts (kale, lettuce, tomatoes, onions, eggplant, etc.), for human consumption and marketing in local markets. Before independence in 1975, a significant portion of the vegetables and small animals (chickens, ducks, and pigs) was made by "colonial settlers," in green belts. After independence, "colonial settlers," farms were occupied by the Mozambican population. However in the 1980s, civil war that plagued Mozambique deteriorated the security of the rural population and as a consequence many people have moved from rural areas to cities intensifying vegetables cultivation and raising of domestic animals (chickens, rabbits and pigs).

Structural changes has been occurring since economy liberalization in 1987 with significant

---

[1] *We use the terms vegetables and fresh produce, interchangeably. We do not include Irish potatoes in this definition.*

[2] *.According to Sitoe (2010b), the land tenure structure in the Maputo green belts is made up of two types of producers: the medium scale farmers (produtores das quintas), which in general are few and the large number of smallholders producers generally affiliated to farmers associations.*

impact on economy, society, natural environment and farmer's livelihoods.

The Infulene Valley, where the study took place, is one of the important regions of the Maputo green belts. In Infulene Valley 275 producers mostly organized in farmers' Associations produce vegetables for consumption and sale in local markets. For a universe of 275 producers the appropriate sample size with 5% confidence level is 163 producers [12]. From an orderly list of producers, systematic random selection technique were used to select 126 respondents, of which 63 were members of producer associations and the rest did not belong to the associations. Due to insufficient resources, the sample was reduced from 163 to 126.

The quantification of the effect of the independent variables on the probability of participating in associative groups was done using the logistic regression model.

According to Gujarati [13], the logistic regression model is expressed from the following formula:

$$Prob(Y = 1) = \frac{\exp(X\beta)}{1 + \exp(X\beta)} + \epsilon$$

Where, Y= $X\beta$ = β_1 Gender + β_2 Age + β_3 Time have been farming + β_4 education attained + β_5 Household size + β_6 Access to agricultural credit + β_7 Agricultural Income + β_8 Total area of field.

Where:

P (Y=1) – Represents the probability;

X - Represent the independent variables (gender, age, time have been farming, education attained, household size, access to credit, income, total area of the field)
β – are the regression coefficients. These cannot be interpreted directly, since they do not represent the marginal effects, therefore it is necessary to calculate the marginal effects of each variable, which are obtained with the following formula:

$$\frac{\partial E[Y|X]}{\partial X} = \frac{\exp(X\beta)}{1 + \exp(X\beta)2}\beta = \Lambda(X\beta)[1 - \Lambda(X\beta)]\beta$$

Є- Represents error or residual term

To calculate the odds associated with Oddis ratio the following formula was used by Gujati (2006):

$$(e^\beta - 1) * 100$$

Where the antilogarithm of the coefficient (β) is equivalent to the Oddis ratio

Data collection took place in two phases from September to October 2012 and from July to September 2013. The survey collected data on production and the different social, economic and demographic characteristics of producers, production systems and income. In addition to the descriptive statistical regression, the *Chi-square* tests were used to compare the qualitative and/ or categorical variables, and the *Bonferroni test* to measure the significance of the means in the two groups (associated and non - associated).

3. RESULTS AND DISCUSSION

3.1 Farmer's Socio-demographic Characteristics and Farming Systems

Table 1 is regarding gender characteristics of the respondents. Of the 126 producers interviewed, 84 (66%) were female and 34% were male, suggesting that farmers' associations in the green belts are mainly constituted by women. These results are consistent with the results of other studies in green areas that indicate that horticultural production is essentially a female activity [11]. The fact that many women in green belts are engaged in farming is a family strategy for supplementing family income. Usually the presence of men in agricultural activities is interpreted as synonymous to lack of formal jobs in the cities. On the other hand, the presence of many women in farmers' association confronts the widespread finding that because of their reproductive responsibilities associated with agricultural production, women may have high opportunity time costs, which may reduce incentives to join as members of groups [14]. In general women can have different opportunities, motivations and abilities than men that can inhibit their engagement in collective actions.

Other socio-demographic characteristics of the farmers are shown in Table 2. Age is related to experience to perform certain tasks, even to adhere to new experiences arising from everyday work. The uncertainty or not, that individuals have to accept new things may be related to the experience they have. Given that older people have a lot of experience tend to join innovations easily than younger age group [15]. The results suggest that there is no significant difference of

the mean ages between the farmers that belong to farmers' association and those outside farmers' associations. However, it should be added that in the Green belts producers are essentially adults, young people are less interested in agriculture.

Table 1. Producers gender in Maputo green belts

Farmers type	Male	Female	Total
Members of farmers' associations	22	41	63
Non-members of farmers' associations	20	43	63
Total	42	84	126

Source: Survey data Pr = 0.705[3]

According to Nkamleu, et al. [16], with age farmers accumulate more personal capital and this demonstrates a great possibility of investing in innovations. For Zbinden and Lee [17], the role of age is more ambiguous because age as a synonym for experience can be offset by a greater reluctance to try out new things, including new technologies or government-funded programs. As for the size of the households, there is no significant difference between the producers within the associations and those outside (Table 2). However, the associated producers present, on average, more members of the household involved in the work of the field compared to the non-members. Between the two groups the average household members working on off farm activities does not differ significantly. However, non-associated producers have on average more household members working on off-farm activities compared to those associated in farmers associations (Table 2).

Table 3 shows the results on the level of schooling obtained. Education strengthens the ability of a person to perceive and conceptualize the effects of collective action and thus to critically assess the advantages and disadvantages in terms of time and money resulting from collective action [18]. However, the

positive correlation between the level of education and participation does not necessarily reflect a true causal effect of education on participation, which is linked to the endogeneity of education; that is, the positive association between education and participation may stem from unobserved factors that may be correlated with both variables.

The most educated farmers are assumed to be well and research the appropriate technologies to alleviate their production constraints. The belief is that education, gives farmers the ability to perceive, interpret and respond to new information faster than their counterparts without schooling.

There are statistically significant differences between education level versus inside or outside the association, with a significance level of 99% (Pr= 0.006) (Table 3). Producers outside farmers' associations have a higher level of education at the basic and medium levels than those who belong to farmers' associations. The majority of the producers within the farmers' associations have no schooling compared to non-members of farmers' associations (Table 3). Results are consistent with [19] findings that in Mozambique, most farmers are illiterate and the average number of years of schooling by heads of household is quite low.

Between the two groups there is no significant difference in terms of farming experience. The majority of Green Zone producers have more than ten years of agricultural activity (Table 4).

Table 5 refers to the technical assistance provided by extension service to the producers in Maputo Green Belts. In Mozambique, provision of agricultural extension services has been dominated by the public services, led by the Ministry of Agriculture and Food Security. However, a review of the public extension services have shown that it does not reach the majority of the smallholder farmers due to shortage of staff, inadequate operational budget and luck of relevant technologies (Cunguara, 2011; Uaiene et al., 2013; and Uaiene and Gemo, 2016). In Maputo Green belts most of the farmers either belong to farmers' associations or not have shown that they do not have technical assistance from agricultural service technicians (Table 5). NGOs have been playing a leading role in promoting the empowerment of rural people so that they could make informed-decisions in the light of their own realities. The

---

[3] *Pr or Pvalue is the probability that the null hypothesis is true. If Pr is less than 0.01 we say the significance value is 99%. If Pvalue or Pr is less than 0.05 but greater than 0.01, for example, Pr = 0.02, a significance level is 95%. If Pvalue is less than 0.10 but greater than 0.05, for example 0.065, the significance level is of 90%. The probability is 0.705 which is higher number so there are no statistically significant differences between the number of male and female producers between members of farmers' associations and non-members of farmers' associations.*

Table 2. Producer's socio-demographic characteristics in Maputo Green Belts

Particulars	Farmer´s association		Non-members of farmers associations		All types		P-value
	Mean	Std. deviation	Mean	Std. deviation	Mean	Std. deviation	
Age of household head (years)	46.49	8.81	49.02	9.12	47.75	9.02	0.1170
Household size (number)	6.46	3.41	6.82	3.98	6.64	3.69	0.5815
Household members working on the farm (number)	1.73	1.57	1.65	1.01	1.16	1.09	0.4161
Household members working outside the agricultural activity (number)	1.65	2.37	2.00	1.34	3.13	2.42	0.0965

Source: Survey data

Table 3. Level of schooling obtained by farmers in Maputo Green belts

Farmers type	No schooling	Elementary School	Elementary school (2nd grade)	Basic Secondary education	Secondary education
Members of farmers' associations	20	23	15	5	0
Non-members of farmers' associations	12	16	23	9	3
Total	32	39	38	14	3

Source: Research data   Pr= 0.006

Table 4. Farmers experience in agricultural activity in Maputo Green Belts

Farmers type	<1 year	1-5 years	6-10 years	>10 years	All types
Members of farmers' associations	3	18	11	31	63
Non-members of farmers' associations	0	14	14	35	63
Total	3	32	25	66	126

Source: Survey data Pr = 0.251

Table 5. Farmer's technical assistance provided by extension services in Maputo Green Belts

Farmers type	Received technical assistance	Not received technical assistance	Total
Members of farmers' associations	22	41	63
Non-members of farmers' associations	1	62	63
Total	23	103	126

Source: Survey data Pr= 0.000

agrarian extension service from Non-Governmental Organizations is almost non-existent in Maputo Green Belts.

Historically, in Mozambique, NGOs have been engaged in delivering extension advice to resource-poor farmers living mostly in areas which are not serviced by public organizations. In these areas, NGOs have become "agents of development" that are actively involved in designing and implementing rural development programs and projects in the wake of major disasters (such as droughts and floods). Agricultural advisory services provided by NGOs have the principal objective of enhancing agricultural development and improving farmers' livelihoods. By promoting the participation of key stakeholders in the decision making processes, emphasizing gender roles and relations and including vulnerable/ disadvantaged groups as the most important target beneficiaries in their agricultural programs, NGOs have proved themselves successful in terms of empowering beneficiaries and responding to the emerging needs which they express.

Access to agricultural credit has been shown to be a key factor in being a member of a group, as for a member of an association is necessary to pay initial quota. In order to join a certain group that is implementing a new technology or a type of investment, sufficient financial capital is needed so that access to credit positively influences membership of member groups [14] Most producers of green areas do not have access to agricultural credit to finance their agricultural activities (Table 6).

According to Filho, et al. (2009), there is a positive correlation between income, cooperativism and access to credit. Producers with greater access to credit, are more apt to associativism, due to higher income and several interrelated factors. On the other hand, the difficult to access the agricultural credit is prominently among the various reasons cited as

the main cause of the failure of technology diffusion. Differentiated access to credit or capital is often cited as a factor of differential rates of adoption of technology, especially in machinery. At the same time, several studies have found that the lack of credit significantly limits the adoption of new varieties. The lack of sufficient savings accumulated by small farmers may prevent them from having the capital needed to invest in new technologies [19].

The literature suggests that small producers associate themselves as a way of accessing more diversified markets (Fisher and Qaim, 2011). In the Maputo Green Belts it was observed that non-members of farmers' associations have more access to product markets. Suggesting that producers outside the associations produce mainly for the markets, practices less developed by the producers of the associations whose primary motivation is production for consumption. On the other hand, the marketing strategy adopted by the association producers is less appropriate. Association producers only expect traders to appear on their farms to acquire the products. These buyers often determine the price they want to pay for the products. Producers outside the associations, in addition to marketing their products on their farms, they take their products on vehicles to local markets. The distance from the field to paved roads may influence whether or not to participate in farmers' association. Farmers who are closer to a paved street have more ease access to the market hence they have little interest in joining associations unlike producers with greater difficulty accessing a paved street, as these can expect good results in joining farmers associations especially for marketing [14]. The distance to the market is assumed to play an important role in the adoption of technology. The further the village or the smallholder from the input and production markets, small is the likelihood for adopting the new technology. Input and output markets are also known as those that influence the adoption of improved agricultural technologies [19].

Table 8 presents the results on farm size, and quantity produced and sold by the respondent farmers. Regarding farm size there is a significant difference between the producers that belong to farmers' associations with those that do not. For Zheng et al. [2] the size of the field has a positive influence on the farmers' adherence to the associations compared to those with smaller sizes, but this variable has a

negative sense at a given moment, because up to a certain size of the farm, participation decreases. The size of the field is often pointed out as an important factor for adoption decisions. It is often argued that farmers with large fields are more likely to adopt improved technology (especially modern varieties) compared to those with small farms, since they can devote part of their fields (sometimes the less productive parts) to test the improved technologies [19].

For the total income, the non-members of farmers' associations have on average higher incomes (249 910.6 Meticais)[4] than the farmers' associations participants (20501.37 Meticais) and the difference of averages of incomes between associates and non-associates is significant at 1%. This finding is a challenge to the belief that producers who engage in associations tend to obtain higher sales income than those outside associations [2]. The income differences may be associated with the amount of seedbeds that the different groups produce and sell in both winter and summer seasons. In general, producers who do not belong to associations of producers have more capacity to produce and sell more vegetables than those belonging to farmers' associations. In summer season the supply is relatively smaller but the producers outside the associations still have more advantage of their production capacity (Table 8).

3.2 Factors Influencing Farmers' Decision to Participate in Farmers' Associations

Table 9 presents the logistic regression results. The coefficient of determination of the R^2 model is 72.46%, suggesting that the participation or non-participation of individuals in the associations is explained by the independent variables inserted in the model (gender, age, activity time, household size, credit, income and total area of field).

The gender of the respondents is significant at a significance level of 10%; giving high probability of participation in farmers' associations to men (Table 9). This finding contradicts the observation that most producers in green areas are female. Several studies indicate that participation in farmers' associations is generally

---

[4] *The total income represents the difference between the production revenue and the total costs of production.*
1USD equivalent to 30.0 Meticais

Table 6. Access to agricultural credit by farmers in Maputo Green belts

Farmers type	Had agricultural credit	Did not have agricultural credit	Total
Within the farmers' associations	4	59	63
Non-members of farmers' associations	5	58	63
Total	**9**	**117**	**126**

Source: Survey data Pr= 0.729

Table 7. Market access by Maputo Green Zone producers

Farmers type	Has access to the market	Has not access to the market	Total
Members of farmers' associations	40	23	63
Non-members of farmers' associations	60	3	63
Total	100	26	126

Source: Survey data Pr= 0. 000

a male activity [19, Opoku, 2012], which may be linked to the fact that although the fields belong to the couple, it is usually men who respond to the inquiries or make decisions about production. This practice represents a strategy to minimize possible risks of land grabbing by outsiders.

The age of respondents is also significant at 10% level of significance. However, when age increased by one year, the probability of membership is 10%, this is within the initial expectation that younger producers tend to be more innovative and risk averse. However, the results are not consistent with those of Nkamleu & Adesina [16] who consider that with more age farmers accumulate more personal capital and this represents a great possibility of investing in innovations.

The household size is significant at 10%. The effect of the probability of the odds ratio presented for this variable is positive which means that the existence of a new member in the household increases the probability of being a member of the farmers' associations by 17%. This data is in line with previous expectations regarding the influence of household size. Probably this is supported by the fact that smallholders own more than 90% of agricultural exploration in Mozambique. At the study site, although families are numerous, only one or two people work the fields – suggesting that the remaining members may be children or are not interested in agricultural activity.

Time of agricultural activity (farming) and education attained do not have significant effect in the model. Observations at the study site suggests that farmers with the most experience in farming are those who join the associations most. Producers with higher levels of education probably have more education for better choices and prefer not to engage in producer associations which challenges the observations that more educated and older heads of households are more likely to be members of welfare groups [18].

Access to agricultural credit and the total area of the farm are not significant. The probability associated with the odds ratio in relation to these variables has positive effects, which means that when access to credit is obtained and the farmers' production area is increased, the probability of membership is 73%, 57%, Respectively [5]. These results are in line with those obtained by Cheng (2011) and Uaiene (2001), who also obtained the same findings regarding these variables.

Household income has a significant effect at 1% on the decision to be or not a member of the farmers' association. The probability associated with the presented odds ratio has a negative effect suggesting that an income increase by one unit reduces the probability of being a member of the association by 1%. These results are within

---

[5] *The interpretation of the odds ratio is (coefficient - 1) * 100%. Odds ratio of 1.73 means increases probability by 73%*

Table 8. Area cultivated and quantity produced and sold by horticultural producers in the Maputo Green Belts

Particulars	Farmer´s association		Non-members of farmers associations		Total		P-value
	Mean	Std deviation	Mean	Std deviation	Mean	Std deviation	
Total area of the field (hectare)	0.195	0.40	1.36	1.90	0.77	1.48	0.0000
Quantity produced (seedbeds)	30.76	17.40	112.69	52.52	79.46	58.17	0.0000
Income (Mt)	20501	32832	249911	367320	135206	84111	0.0000
Quantity sold during summer season (seedbeds)	24.48	53.47	106.98	44.17	193.54	48.02	0.0000
Quantity sold during winter season (seedbed)	27.83	58.20	113.49	13.87	76.89	23.76	0.0000
Price summer season (Mt)	189.77	53.47	196.11	44.17	193.54	48.02	0.5068
Price winter season (Mt)	87.66	36.55	129.21	40.45	111.46	43.83	0,0000

Source: Survey data, Note: 1 USD = 30.00 Mt

Tabela 9. Logistic regression results

Variables	Odds Ratio	P> |z|
Gender	6.98	0.065*
Age of household head	0.906	0.059*
Time farming	0.654	0.362
Education attained	0.783	0.123
Household size	1.166	0.099*
Access to agricultural credit	1.732	0.721
Income	0.999	0.000***
Size of the field	1.572	0.537
_cons	14664.32	0.002

*Source: Research data * Significance level of 10% ** Significance level of 5%. *** Significance level of 1%*

the expectations of this study because most of the producers in Maputo Green belts within farmers' associations only come together to protect landowners' associates and allow contact with agricultural extension agents to get technical assistance. The members of farmers' associations manage their own production activities and sales in isolation.

4. CONCLUSION AND RECOMMENDATION

The involvement of producers in farmers' associations represents a strategy for producers to minimize the risks of their land being usurped by third parties. Usually the low income farmers and with few possibilities are the ones that engage more in farmers' associations. The non-members of farmers' associations have more opportunities outside the fields and therefore are in better conditions than the farmers within the farmers' associations. The fact that farmers within the farmers' associations are less educated and have less income represents an opportunity for empowerment actions to be taken to improve their production and living conditions. Training in appropriate production and better marketing help producers to change their lives. Attention should be given to the empowerment of youth, especially young women, by giving them the skills needed to improve production and income. Today, young people face great difficulties in finding formal jobs in cities.

Farmers' associations in Maputo Green belts face several constraints to their functioning. This is partially allied to the lack of clarity of the farmers' associations' leaders regarding farmers' associations' management, the dubious management of quotas, lack of sharing of difficulties between members. As a consequence each member carries out its production and sales activities in an isolated manner. They only carry out jointly the cleaning works of the watering and drainage of ditches.

The Center for the Promotion of Agriculture (CEPAGRI) and Agricultural Extension Srvices are encouraged to promote microcredits, farmers' training in farmers' association's management methods and negotiation for access to more competitive markets, mainly to associated farmers.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Schmitz PG, Prim LF, Andrade ET. O empoderamento da rede de economia solidária do vale do Itajaí-Resv; 2º Seminário Nacional Estado e políticas sociais no Brasil; 2005.
2. Zheng P, Wang Z, Awokuse OA. Determinants of producer's participation in Agricultural cooperatives; evidence from Northern China. Editor Ashock Mishra; 2011.
3. Bachke ME. Are farmers' organizations a good tool to improve small-scale farmers' welfare? II Conferencia do IESE "Dinâmicas da Pobreza e Padrões de Acumulação em Moçambique", Maputo, 22 e 23 de Abril de 2009.
4. Costa AG. Capital social: De elemento da cultura cívica à política de governo, UNESP, Araraquara (SP). Brasil; 2013.
5. De Aquino JA. As teorias da acção social de Coleman e de Bourdieu. Humanidades e ciências sociais;2nº2. In: Coleman JS . Foundations of social theory. Harvard University Press; 2000.

6. Nelson N, Wright S. Introduction in power and participatory development. Theory and Practice. London: Intermediate Technology Publications. 1995;1-18.

7. Valá SC. A riqueza está no campo, Economia Rural, financiamentos aos empreendedores e fortalecimento institucional em Mocambique; IESE sociais económicos; conference paper. 2007; In: Negrão repensado as modas do desenvolvimento rural; 1997.

8. Virgílio I. Movimento cooperativo em Moçambique no pós Independência: A cooperativa agro-pecuária 16 e Junho como modelo de resistência às mudanças políticas e económicas -1980 até a actualidade. Dissertação de Licenciatura da Universidade Eduardo Mondlane; 2005. In: Casal, A. 1991 & Ministério da Agricultura, organização do Movimento cooperativo Agrário,

9. Gefferay C. La cause des armes au Mozambique. Antropologia de une guerra civile; 1990.

10. Tschirley D, Hichaambwa M, Ayieko M, Cairns J, Elly V, Mwiinga M. Fresh produce production and marketing systems in east and southern Africa. A Comparative Assessment. Michigan State University; 2012.
    Available:https://pdfs.semanticscholar.org/1eba/31a9f8c951b0d5b77a218d4401d4652a90cf.pdf

11. Sitoe TA. Diversificação produtiva e de actividades de geração de renda: uma análise da produção hortícola no cinturão verde da cidade de Maputo- região sul de Moçambique. Porto Alegre: UFRGS; 2010.
    Available:http://www.redesrurais.org.br/sites/default/files/Processo%20de%20socializa%C3%A7%C3%A3o%20do%20campo%20em%20mo%C3%A7ambique%20p%C3%B3s-independ.pf

12. Powell TE. Sampling program. Development and Evaluation; University of Wisconsin; cooperative extension; 1998.

13. Gujarati DN. Econometria básica; Editora campus; 2006.

14. Fischer E, Qaim M. Linking smallholders to markets: Determinants and impacts of former collective action in Kenia. World Development, Elsevier. 2012;40(6):1255-1268.

15. Cachomba I, Cunguara, B, Mlay G, Donovan C. The determinants of animal traction adoption in Mozambique. African Crop Science Conference Proceedings. 2011;10:307-310.

16. Nkamleu GB, Adesina AA. Determinants of chemical input use in peri-urban lowland systems: bivariate probit analysis in Cameroon; ELSEVIER; Agricultural Systems; 1999.

17. Zbinden S, Lee DR. Paying for environmental services: An analysis of participation in Costa Rica's PSA program', World Development. 2005;33(2):255-72.

18. Ouma E, Abdulai A. Contribution of social capital theory in predicting collective action Behaviour among livestock keeping communities in Kenia; Contribution paper prepared for presentation at the international association of agricultural economists conference, Beijingm, China; 2009.

19. Uaiene R. Determinantes para a Adopção de Tecnologias Agrícolas em Moçambique, Maputo; 2011.