FACTORS INFLUENCING ADOPTION OF ONE ACRE FUND PROJECT BY FARMERS IN KANDUYI SUB-COUNTY, KENYA

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ABSTRACT

This study assessed the level of adoption of One Acre fund (OAF) agricultural project and its influence on the livelihoods of beneficiaries in Kanduyi Sub-county, Bungoma County, Kenya. The study was appropriate because One Acre Fund management is set to implement it in the next 10 years with the aim of reaching 1 million farmers. The objective of the study was to establish factors that influence adoption of One Acre Fund project by farmers. The study premised on two theories; the innovation diffusion model and the sustainable livelihoods model. The theories complemented one another in explaining the study. Descriptive research design, survey and 'before' and 'after' designs were used in the study. The sample of the study was 116 heads of households who adopted OAF. Two OAF officials, two farmer field facilitators and two officials from ministry of Agriculture were key informants for the study. Purposive and snowball sampling techniques were used to get the desired sample. Questionnaire and interview schedule were used to obtain data from respondents. Descriptive statistics such as percentages and frequencies were used for data analysis. The study findings show that majority of OAF farmers were small scale women farmers with farm sizes of below 3 acres. Moreover, majority of the farmers had primary education and were below 39 years in age. OAF field officers and snow ball effect of friends played a crucial role in mobilizing farmers to join OAF, also good harvest, provision of inputs on credit, efficient training in field schools were key drivers in joining OAF. The study recommends that OAF introduces other crops like tomatoes and water melons among others, provide irrigation kits and introduce horticultural farming such as green house technology to further boost livelihoods of farmers.

Key words: Adoption, Innovation, One Acre Fund project, Livelihood assets, Factors

Background

The innovative nature of One Acre Fund aims at achieving food security. A household is considered food-secure when its occupants do not live in hunger or fear of starvation. Although countries may desire a high self-sufficiency rate to avoid food shortage risks, this may be difficult to achieve especially for less wealthy countries, generally due to higher production costs. The number of people without enough food to eat on a regular basis remains stubbornly high, at over 800 million, and it is not falling significantly. Over 60% of the world's undernourished people live in Asia, and a quarter in Africa. The proportion of people who are hungry, however, is greater in Africa (33%) than Asia (16%) (Berdegue and Escobar, 2002).

Aermi, (2011) argue that there are strong, direct relationships between agricultural productivity, hunger, poverty, and sustainability. Three-quarters of the world's poor live in rural areas and make their living from agriculture. Hunger and child malnutrition are greater in these areas than in urban areas. Moreover, the higher the proportion of the rural population that obtains its income solely from subsistence farming (without the benefit of pro-poor technologies), the higher the incidence of malnutrition. Growing sufficient food will require people to make changes such as increasing productivity in areas dependent on rain fed agriculture; enhancing soil fertility management; expanding cropped areas; investing in irrigation; conducting agricultural trade between countries; and reducing gross food demand by influencing diets and reducing post-harvest losses. All these call for innovation.

Agriculture is the most important sector in the Kenyan economy given its contribution to employment, foreign exchange, food, and its linkages with other sectors of the economy. However in the last ten years or so, the performance of the sector has been steadily declining, culminating into negative growth in the year of 2000.The decline has been identified as the major cause of poverty in Kenya. Reversing this trend therefore calls for innovation and transformation of small scale agriculture into more intensive and productive sector (KIPPRA, 2004). Various projects have been launched in a bid to revamp this sector, for example WEMA (2008) state that Water Efficient Maize For Africa (WEMA) is a public-private partnership project led by African Agricultural Technology Foundation (AATF) that addresses the devastating effects of drought on small-scale farmers in Sub-Saharan Africa.

The projects' partners have been developing new drought tolerant African maize varieties since 2000 by incorporating the best technology available; plant breeding and biotechnology.

One Acre Fund is an NGO that invests in farmers to generate a permanent gain on farm income to reduce poverty and hunger. Unlike most interventions designed to improve farming incomes in poor settings, One Acre Fund facilitates activities and transactions at each level of the farming value chain. The program is proven impactful – every year, One Acre Fund weighs thousands of harvests and measures more than 100% average gain in farm income per acre. The approach has won widespread validation, winning grants from the highly competitive Echoing Green Scholarship, and the global Financial Times/IFC award for "basic needs financing" in 2010 and 2011. The project was started by Andrew Youn an American, in the year 2006 and has its head quarters in Bungoma town in Bungoma County, Western Kenya. As of January 2014, OAF had actively served 180,000 farmers in Kenya, Rwanda and Burundi, OAF has an ambitious goal to reach more than 1 million farmers in the next ten years (OAF, 2013). Farmers in Kanduyi Sub-County have widely adopted OAF project.

Literature Review

Adoption of innovations has been basically constructed on a number of factors such as economic, social and political factors. However innovation attributes and farmers' orientation towards change usually affect the desire to adopt and the rate of adoption of new ideas in a social system. For example Rogers (1995) points out that many technologists believe that advantageous innovations will sell themselves, that the obvious benefits of a new idea will be widely accepted by potential adopters, and that the innovation will therefore diffuse rapidly. Seldom is this the case, most innovations in fact, diffuse at a disappointingly slow rate. From this argument it is probable that there are several other intricate factors that affect adoption and diffusion of innovations as it will be discussed in this discourse. Features of an innovation may determine its adoption for example Rogers (1995) assert that the characteristics of innovations explain their rate of adoption. These characteristics are: the relative advantage which reflects how the innovation is subjectively perceived superior to the previous ones or ideas; compatibility which means how the innovation is perceived to be consistent with the existing values, past experiences and needs of potential adopters; triability which means the degree to which an innovation may be experimented with on a limited basis; complexity which means the degree to which an innovation is difficult to understand, and finally observability which refers to how the results of an innovation are

visible to others. This study will therefore also explore how this attributes feature in and affect OAF adoption.

Baraghani (2007) suggests that the need to understand factors influencing the adoption of internet banking is important for managers, providers and researchers. In the technologically developed world, IT adoption is faced by barriers such as lack of top management support, poor quality, IS design and inadequately motivated and capable users. Despite this challenges facing internet banking, banks in Iran are trying to introduce internet-based e-banking systems to improve their operations and reduce costs.

Government as well as political forces can influence adoption and use of innovation. Aermi (2011) observe that in 2009, genetically modified (GM) crops were cultivated on an area of 134 million hectares worldwide and had been consumed as food and animal feed since 1996. Yet, many European governments including those of France and Germany have imposed a de-facto ban on the cultivation of GM crops, and, with a few exceptions, European retailers are not selling GM food products. This is because genetic engineering in agriculture is associated with risk for human health and the environment, cooperate power and threats to traditional farming. Sturdy et al (2010) and Adesina and Furson (1999) on the other hand recognize that the importance of commodity attribute perceptions has long been of interest to social scientists and farmers in adoption. For a farmer to accurately decide that an innovation is worthy of investment, they should have a realistic understanding of its risks and benefits. This will help them avoid wasting resources on an innovation that is not suited to their specific situation.

Farmers perceptions on new projects may influence their adoption decisions for example Manyong et al (2008) argue that farmers could be motivated to adopt new technologies if they perceive the utility of the new technology as larger than that of the existing one, be it traditional or modern technologies. The utility perception is influenced by the technology specific attribute. For example farmers in Western Kenya grow three different varieties of maize, local, hybrid and HR maize which is meant to control the effect of striga. These varieties were evaluated for preference against agronomy attributes of; maize yield, technical simplicity, cost of management, striga population reduction, enhancement of soil fertility, vegetative vigor, ability to withstand a biotic and biotic factors and time to maturity. Murenga (2010) underscores the above argument by reporting that perception of environmental degradation problems have been found to be related to agro-forestry adoption by farmers in

Mau catchment area in Nakuru County. That indeed most farmers are said to adopt new agro-forestry practices based on perception of priority needs for tree products and services among farmers. Whereas Murenga (2010) discussed the effect of farmers' perception of benefits of an innovation before its adoption, based her argument on adoption of organic farming and agro-forestry that was concerned with environmental degradation prevention, this study however focuses on farmers' perception on adoption of OAF that aims at improving their livelihoods.

Daghfous et al (1999) assert that variables such as communication, social structure, demographics and culture influence adoption of innovation. Also consumer behavior aspects such as the normative, affective and cognitive influence adoption of innovations. Cognitive is the exposure to information related to new products while affective domain is the product and information about it, and the normative is the estimated rapidity for the continuous use of the new product. Various studies have considered factors which affect technology adoption to be access to credit, risk aversion, human capacity and other farm/farmer characteristics among other factors. For instance Wabbi (2002) stipulates government policies, technological change, market forces, environmental concerns, demographic factors, institutional factors and delivery mechanisms as some of the factors that affect adoption of innovations. Kabede et al (1991) in Wabbi (2002) categorize adoption factors under social, economic and physical categories, they further categorize adoption factors in broad categories of farmer characteristics, farm structure, institutional characteristics and managerial structures. Most of the authors quoted have discussed innovation characteristics as one of the major factors influencing adoption of innovations. However none of them has discussed such innovation characteristics with regard to OAF in Kanduyi Sub-County. This gap, therefore this study endeavored to fill.

Age of a farmer is expected to influence technology adoption in any direction depending on his or her position in the life cycle, education level and experience. Younger farmers are more likely to be interested in adopting new technologies if they are not restrained by cash resources, while older farmers are less likely to be able to use new technologies if they require extra physical labor and or cash. Also farm size, extension contact and income influence adoption of innovations (Tiamiyu et al 2009). However Murenga (2010) in her study on adoption of organic farming and agro-forestry in Mau catchment area inNakuru County differs with this argument by asserting that the notion that farmers with higher

education are likely to adopt new farming technologies is likely to be disapproved by the results .This is because in her study majority of farmers had low literacy levels and old in age but still adopted organic farming and agro-forestry.

Similarly Nsabimana and Masabo (2005) and Emenyema (1987) argue that age, education, income and frequency of contact with extension agents have a positive correlation with adoption. He also argues that education and socio-economic status among others are significantly associated with adoption of new crop varieties .Africa Rice Centre (2008) from the results of the econometric analysis of the socio-economic determinants of adoption of New Rice for Africa (NERICA) varieties in cote de'ivoire show that the main factors which positively influenced the adoption of NERICA included, growing rice partially for sale, household size, growing upland rice (positive impact), post harvest participation in Participatory Varietal Selection (PVS) trials and living in a PVS hosting village. This current study will therefore probe how these farmer characteristics feature in the adoption of OAF in Kanduyi Sub-County. On the institutional front, the private sector is very important in adoption of innovations. For example Pray et al (2011) note that the private sectors in all African countries have introduced many technologies that constitutes in-country, if not global innovations. Since the year 2000, private companies have introduced between 37 and 105 maize cultivars, 2 in Senegal and 482 in South Africa, more cultivars give farmers more options serve more ecological conditions and promote competition.

Smale et al (2011) underscores the above arguments by stating that private companies have helped in adoption of improved open-pollinated varieties and hybrids at 44 per cent of maize area in Eastern and Southern Africa in 2006 – 2007 excluding South Africa and 60 per cent in West and central Africa in 2005.Likewise OAF is a private organization that has brought improved maize and beans varieties in Kanduyi Sub-County. In summary most of the literature reviewed in this subsection explains factors related to innovation attributes, adopter characteristics and institutions. However it is important to note that none of them has discussed how these factors affect adoption of OAF in Kanduyi Sub-Sub County. This study shall therefore fill this gap by scrutinizing how the discussed factors and gender issues affect decision making process in adoption of OAF project.

Methodology

Kanduyi Sub-County is one of the Sub-Counties in Bungoma County in Western Kenya. It borders Bumula Sub-County to the West, Sirisia Sub-County to the North, Webuye Sub-

County to the East, and Mumias Sub-County to the South. The Sub-County lies between latitude 0^{o} $30^{'}$ and 0^{o} $40^{'}$, north and longitudes $34^{o}20^{'}$ and $34^{o}40^{'}$ east. It covers an area of 663.3 km^2 (Republic of Kenya, 2009). It has five locations and fourteen sub-locations. The Sub-County has one constituency; Kanduyi. According to the 2009 population census, Kanduyi Sub-County has a total population of 408,598 people, with 198,713 male and 209,885 females (Republic of Kenya, 2010).

Descriptive research design was used. Given the large size of the study area, survey research design was used to solicit data from the wide range of respondents using interview schedule. To assess the actual effect of OAF on the livelihood of household, the study used the modified 'before and after' design, a type of experimental design. Kumar (2005) argue that the 'before-and-after' design, overcomes the problem of retrospectively constructing the 'before' observation by establishing it before the intervention, using farmers records the study examined the status of farmers' livelihoods before adoption of OAF project. The target population for this study comprised all farmers in Kanduyi Sub-County. This region was purposively selected because many of its farmers have adopted the One Acre Fund project (Republic of Kenya, 2009). Simple random sampling was used in selecting OAF farmers for interview. This gave all farmers an equal opportunity of being selected to be part of the sample hence avoiding biasness. Purposive sampling method was used in selection of key informants like, officials from the Ministry of Agriculture, One Acre Fund officials, and farmer field facilitators because they had appropriate information the researcher is looking for.

The sampling frame for this study is derived from the 2009 population census in which Kanduyi Sub-County has a total population of 408,598 people.

Yamene(1967) came up with a formula for sample size determination that used in getting the sample of study. The formula from Yamane is;

$$n = \frac{N}{1+N(e)2}$$

where

n = sample size, N = Population size ,e = The level of precision.

The level of precision, sometimes called sampling error, is the range in which true value of population is estimated to be. This range is often expressed in percentage points (for example + 0.5 per cent).For this study the level of precision was 0.09.

$$N = 2011$$

$$e = 0.09$$

$$= \frac{2011}{1 + (2011)\,(0.09)^2}$$

$$= \frac{2011}{1 + 16.2891}$$

n = 116 heads of households.

Both primary and secondary data was collected. Secondary data was obtained from Bungoma County Development plan office, Bungoma County information centre and internet to back-up the primary data which was generated using questionnaire and interviews schedule. Descriptive statistics such as percentages and frequencies were used for data analysis.

Results

The study established respondents' views on the rate of adoption of OAF by farmers. Responses to this aspect are presented in Table 1.1.

Table 1.1: The Rate of Adoption of OAF by Farmers

Rate	Frequency	Percentage
Very high	45	38.8
High	40	34.5
Low	9	7.8
Fair	20	17.2
Very low	2	1.7

Total	**116**	**100.0**

Source: Field Data (2015)

Data in Table 1.1 show that majority 45(38.8%) of the respondents involved in the study rated the rate of adoption of OAF by farmers as very high. In addition, 40(34.5%) of the respondents rated it as high. Therefore, cumulatively, 85(73.3%) of the respondents involved in the study highly rated the adoption of OAF by farmers. This was an indication that most famers had embraced OAF projects in the sub-county based on the benefits that were evident. However, 20(17.2%), 2(1.7%) and 9(7.8%) of the respondents rated the adoption of OAF by farmers as fair, very low as low respectively. Nevertheless, all the 8(100%) officials involved in the study indicated that they had active farmer groups in their areas of jurisdiction.

The adoption of OAF by farmers in Kanduyi sub-county was further assessed through establishment of the involvement between 2006-2014 as indicated in Table 1.2.

Table 1.2: Enrolment of Farmers in OAF in the Period 2006-2014 (N=8)

Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
No. of farmers	30	42	56	60	74	88	93	102	173

Source: Field Data (2015)

Table 1.2 indicates that the number of farmers enrolment in OAF had steadily grown over the period. In 2006, there were only 30 farmers who were enrolled in OAF. The number increased in 2007 to 42. This was an increment of 40% from the previous year. The figures indicated only refer to new enrolment in a cell group not the total number of farmers in the sub-county. In 2008, there were 56 new farmers joining the OAF. This was equivalent to 33.3% increase in enrolment compared to the previous year. There were 60, 74, 88, 93, 102 and 173 new enrolments in the years 2009, 2010, 2011, 2013 and 2014 respectively. Indeed, the adoption of OAF by farmers in Kanduyi sub-county is high and steady.

Respondents were requested to compare their income status from farm produce from AOF since its adoption and before. Their responses are presented in Table 1.3.

Table 1.3: Income Status from farm Produce from OAF Since Its Adoption and before

Respondent	Frequency	Percentage
Excellent	46	39.6
Very good	40	34.5
Good	25	21.6
Fair	5	4.3
Poor	0	0.0
Total	**116**	**100**

Source: Field Data (2015)

Data show that majority 46(39.6%) of the respondents involved in the study rated their income status from farm produce from OAF since its adoption and before as excellent. In addition, 40(34.5%) of the respondents rated it as very good and 25(21.6%) as good. Cumulatively, 111(95.7%) of the respondents acknowledged that their income status had really improved since their adoption of OAF projects. This was an indication that OAF activities were strategic in improving the livelihoods of its members by improving their economic status through selling of farm produce. Respondents further acknowledged that there was food security in their households as a result of OAF projects.

One of the factors influencing adoption of OAF project by farmers in Kanduyi Sub-County is attributed to asset/capital improvement as indicated in Table 4.10.

Table 1.4: Role of OAF Adoption in Asset/Capital Improvement

Type of assets/capital	Very low		Low		Average		High		Very high	
	F	%	F	%	f	%	F	%	f	%
Human assets e.g. improved skills for farming, knowledge entrepreneurship, health	0	0	0	0	0	0	16	13.8	100	86.2

Physical assets such as infrastructure, housing, equipment, shelter, energy	4	3.4	8	6.9	88	75.9	6	5.2	10	8.6
Natural assets e.g. buying land water, forests, biodiversity	8	6.9	18	15.5	12	10.3	18	15.5	60	51.7
Social assets e.g. groups, networks, trust and access to industries	10	8.6	4	3.4	5	4.3	0	0.0	97	83.6
Financial assets e.g. savings, access to credit facilities	6	5.2	3	2.6	8	6.9	0	0.0	99	85.3

Source: Field Data (2015)

Majority 100(86.2%) of the respondents involved in the study rated the role of OAF in asset or capital improvement as very high with regard to human asset. That is, 100(86.2%) of the respondents noted human assets such as improved skills for farming; knowledge entrepreneurship and health were high as result of adoption of OAF . In addition, 16(13.8%) of the respondents rated improvement of human assets as high due to adoption of OAF projects. Therefore, all (116(100%) of the respondents involved in the study acknowledged that human assets such as improved skills for farming knowledge, entrepreneurship and health as a result of adoption of OAF projects.

The study found out that majority 88(75 %) of the respondents rated physical assets such as infrastructure, housing, equipment, shelter and energy as average as a result of OAF adoption. This was an indication that OAF adoption had positively changed physical assets such as infrastructure, housing, equipment, shelter and energy as a result of farmers' adoption of OAF.

Similarly, majority 60(51.7%) of the respondents involved in the study rate natural assets such as buying land, water, forests and biodiversity as very high as a result of farmers adoption of OAF projects. In addition 18(15.5%) of the respondents rated natural assets as high following adoption of OAF projects by farmers . therefore, cumulatively, 78(67.2%) of the respondents acknowledged that farmers adoption of OAF projects had improved natural assets such as buying land, water, forests and biodiversity.

Nevertheless, 97(83.6%) of the respondents involved in the study rated social assets such as groups, networks, trust and access to industries as very high after adoption of OAF projects. The farmers are able to indicate in groups and form networks as a result of adopting OAF projects.

Lastly, majority 99(85.3%) of the respondents involved in the study rated financial assets such as savings and access to credit facilities as very high as a result of farmers adoption of OAF projects. OAF projects help farmers to increase their savings and access to credit facilities hence improving their economic base and status.

Officials of OAF further commented on the effect of participation of OAF farmers in the design, planning and execution of OAF projects in various aspects as indicated in Table 1.5.

Table 1.5: Comments on the effects of participation of OAF farmers in OAF on livelihood dimensions.

Dimension/effect	Poor		Very poor		Fair		Good		Very good		Excellent	
	F	%	F	%	F	%	F	%	F	%	F	%
Income improvement	0	0.0	0	0.0	0	0.0	6	100	0	0.0	0	0.0
Education	2	33.3	2	33.3	0	0.0	1	16.7	1	16.7	0	0.0
Good health care	0	0.0	0	0.0	0	0.0	3	50.0	2	33.3	1	16.7
Less vulnerability	0	0.0	0	0.0	2	33.3	3	50.0	1	16.7	0	0.0
Food security	0	0.0	0	0.0	0	0.0	1	16.7	2	33.3	3	50.0
Decision making	0	0.0	0	0.0	1	16.7	2	33.3	2	33.3	1	16.7
(governance)	0	0.0	0	0.0	3	50.0	3	60.0	0	0.0	0	0.0
Improved well being	0	0.0	0	0.0	1	16.7	3	50.0	2	33.3	0	0.0
Sustainable use of land	0	0.0	0	0.0	0	0.0	1	16.7	3	50.0	2	33.3
Housing	0	0.0	0	0.0	3	50.0	3	50.0	0	0.0	0	0.0
Employment creation	0	0.0	0	0.0	2	33.3	1	16.7	2	33.3	1	16.7

Source: Field Data (2015)

In terms of income improvement 6(100%) of the respondents rated it as good.Seriously, OAF had not done very well in the area of supporting education directly. As a result 2(33.3%) of the officials engaged in the study rated it as very poor in affecting education directly as

2(33.3%) rated it poor. However, 1(16.7%) and 1(16.7%) of the respondents rated its effect on education as good and very good respectably.

With regard to good health care, majority 3(50.0%) of the respondents rated it as good and 2(33.3%) rated it very good. Cumulatively, 5(83.3%) of the respondents acknowledged that farmers' participation in the design, planning and execution of OAF has contributed to good health care. This was attributed to the fact that farmers' household members and dependents were able to get food from their farms for subsistence and even sell the surplus. Therefore, hunger and malnutrition effects were controlled as a result of farmers' participation in the design, planning and execution of OAF projects. Furthermore, 1(16.7%) of the respondents rated the effects of farmers participation in the design, planning and execution of OAF projects on good health care as execellent. Generally, therefore 6(100%) of the OAF officials noted that there was good health care as a result of the farmers participating in the design, planning and execution of OAF projects.

Similarly, 2(33.3%) and 3(50%) of the respondents engaged in the study as officials rated the effect of participation in the design, planning and execution of OAF projects on less vulnerability as good and fair respectively. Generally, 5(62.5%) of the respondents noted that participation in the planning and execution of OAF projects had rendered farmers less vulnerable to poverty, hunger, malnutrition and poor environment. Also 1(16.7%) noted that the effect farmers' participation in the planning and execution of OAF projects on less vulnerability was very good.

In addition, 1(16.7%) of the respondents noted that the effect of participation in the design, planning and execution of OAF project on food security was good. Also, 2(33.3%) of the respondents rated it as very good as 3(50%) rated it excellent. Cumulatively, therefore, all 6(100%) of the respondents acknowledged that there was a positive effect of farmers' participation in the design, planning and execution of OAF projects on food security. OAF was therefore, regarded as a sure way of assisting farmers have adequate balanced food throughout the year produced on their small farms. This was achieved through the "TATU HADI TATU" slogan interpreted as three for three which required each farmer to store three bags of maize from the period of harvest up to the month of March the following year before commencing its consumption.

The study also sought to establish the effect of farmers' participation in the design, planning and execution of OAF on decision making. Data show that majority 1(16.7%) of the respondents engaged in the study rated the effect of participation in the design, planning and execution of OAF projects on decision making as fair. In addition, 2(33.3%) and 2(33.3%) of the respondents rated it as good and very good respectively while 1(16.7%) rated it as excellent. Therefore, 5(83.3%) of the respondents acknowledged that participation in the design, planning and execution of oaf projects had improved decision making by farmers. Governance had also improved as a result of farmers participating in the design, planning and execution of the OAF projects. The study found out that 3(50%), 3(50%) of the respondents involved in the study rated the effect of participation in the design, planning and execution of the OAF projects as fair and good respectively.

Participation in the design, planning and execution of the OAF projects had also improved the wellbeing of household members. Collected data reveal that majority 1(16.7%) of the respondents rated the effect of participation in the design, planning and execution of the OAF projects on the wellbeing of members households as fair. Furthermore, 3(50%) and 2(33.3%) of the respondents rated it as good and very good respectively.

Participation in the design, planning and execution of OAF projects had also led to sustainable use of land. The study showed that 1(16.7%) of the respondents rated the effect of participation in the design, planning and execution of OAF projects on sustainable use of land as good. Similarly, 3(50%) of the respondents rated it as very good as 2(33.3%) rated it excellent. Cumulatively, all 6(100%) of the respondents supported that participation in the design, planning and execution of OAF had led to sustainable use of land.

Participation in the design, planning and execution of OAF projects had improved housing for the members and their households. The study found out that 3(50%) of the respondents rated the effect of participation in the design, planning and execution of OAF projects on housing as fair. Additionally,3(50%) of the respondents rated it as good. Therefore, participation in the design, planning and execution of OAF projects had improved the housing state of the members.

OAF projects also provide employment to its members either indirectly or directly. It was found out that majority 2(33.3%) of the respondents involved in the study rated the effect of participation in the design, planning and execution of OAF projects on employment creation as fair. Similarly, 1(16.7%) and 2(33.3%) of the responses rated it as good and very good respectively while 1(16.7%) rated it as excellent.

Conclusion

The benefits from OAF have attracted non-members to join OAF. Farmer participation in the design, planning and implementation of OAF projects is quite good and encouraging. The challenges emanating from low market and natural sources such as poor weather are mostly faced by farmers. Some of the strategies used to enhance OAF are not fully embraced. For example, all 116(100%) indicated that the internet service was not in use. Majority, this was attributed to the fact that majority of the respondents lacked computer knowledge and therefore, the use of internet to access OAF farming activities was not popular with them. However, it should be noted that OAF information is available on the internet; only that the farmers were not competent in information communication technologies (ICT) and therefore, would not use the internet as a means of accessing service about OAF farming activities.

Recommendations

The study makes the following recommendations based on the findings;

1. There is need for OAF projects to be expanded to benefit farmers with more than five acre pieces of land.
2. There is need for OAF programme to establish its own input processing industries to supply farmers with highly subsidized inputs.
3. OAF programme should put in place marketing and storage initiatives for the members' produce.

Bibliography

AATF (2010) *A study on the Relevance of Chinese Agricultural Technologies to small holder Farmers in Africa.*Majesti printing works.

Abaru, B.M, Nyukuri, A. and Shone, G. (2006) *Strengthening Farmer's organizations*; *RELMA'S experiencein Eastern and Southern Africa, ICRAF WORKING PAPER NO.23*; World Agro forestry centre, Nairobi, Kenya

Africa Rice Center, (2008) NERICA *Adoption and impact; summary of findings from four countries,* Research and Development Brief August 2008.

Aermi, P. (2011) *Do political Attitudes Affect consumer choice?Evidence from a large-scale Field Study with genetically modified Bread in Switzerland,* World Trade institute, Beru, Switzerland.

Alene, I, Yigeza, Y, Ndjuenga, J., Labarta, R., Andrade, R., Diagne, A'.Muthoni, R., Simtowe, F., and Walker, T. (2011) *Measuring The Effectiveness of Agricultural RSD in Sub-Saharan African from the Perspectives of varietal output and Adoption, initial Results from the diffusion of improved varieties in Africa project*, Conference working paper 7

Al-Somali,S.A, (2011) *Electronic Commerce Adoption; A study of Business-to-Business Practices in Saudi Arabia,* Doctoral Thesis, Aston University.

Baraghani,N,S.(2007) *Factors Influencing the adoption of Internet Banking,*AMasters Thesis Lulea University of Technology

Berdegue, J.A and Escobar, G (2002) *Rural Diversity, Agricultural innovation policies and poverty Reduction Agricultural Research & Extension Network pape*r No. 122, DFID, UK.

Boadu, P. Yamga, A.G., Amoako, J. and Mboab, J. F., (2011) *Agricultural innovations for climate change Adaptation and food security in Africa; the cases of Ghana and Gambia.* African Technology policy studies Network Research paper no, 11 Nairobi, Kenya.

Castilo, G.E, Minh, N. and Kumberly, P (2012*) Learning from the system of Rice intensification in Northern Vietnam,* International food policy Research institute.

Cleaver, K, (2012) *Scaling up in agriculture Rural Development and nutrition; investing in Agriculture to Reduce poverty and Hunger,* International Ford policy Research institute.

COMESA and ACTESA (2010) *Opportunities and challenges for strengthening staple food markets inEastern and southern Africa*. Comesa

CEC (2008*) Towards a coherent strategy for a European Agricultural Research Agenda Communication from the commission to the council, the European Economic and social committee and the and the committee of The Regions*, Brusels.

CREPE (2011) *Agricultural innovation; sustaining what Agriculture? For What*

*European Bio- Economy?*Project-wide final report, Oxford university press.

Daughfous, N., Petrov, V.J. Pons, F. (1999) *Values and adoption of innovation; a cross-cultural study,Article in journal of consumer marketing*. *Vol 16 No.4 1999,*MCB university press.

Etwire, P. M. ,Doybe, W. ,Wiredue, A. N., Owusu, K. r.,andWahagu, E. I (2003) *Factors Influencing Farmers' participation in agricultural projects; the case of the agricultural value chain mentorship project in Northern region of Ghana article in Journal of Economics and sustainable development vol4 No 10. 2013*, Saharan agricultural institute, Ghana

Emenyema, B.N, (1987) *Communication and adoption of agricultural innovations, quantifications and Notes towards a conceptual model an article in Africa media review journal vol1 No.2 1987pp68*

European Union committee (2011) *Innovation in EU agriculture, 19th Report of Session 2010 – 12 HL paper 171*. The stationary office limited, London.

FAO (2003) *Participatory Development; Guidelines on Beneficiary Participation in Agricultural and Rural Development*, FAO, Rome, Italy.

FAO (2011) *The State of Food and Agriculture; Women in Agriculture, Closing The Gender Gap For Development*, FAO, Rome.

Halila ,F.(2007) *The adoption and diffusion of environmental innovations*, PhD Thesis, Lulea University of Technology.

Heck, B. V (2003) *Participatory development, guidelines on beneficiary participation in agricultural research and development*, FAO, Rome Italy.

KENFAP (2013) *Enhancing farmers participation in the new government structurein Kenya,* KENFAP, Kenya.

Khwaja, A. I., (2004) *Is increasing community participation always a good thing? Journal of the European Economic Association*Harvad University press, Harvad UK.

Kumar, R (2005*) Research methodology; A step-by-step guide for Beginners*, SAGE publications, London, UK.

Kibet, J.K., Omunyim, M.E and Muchiro, J. (2005*) Elements of agricultural extension policy in Kenya, Challenges and opportunities*. African crop sciences proceedings paper vol 7 African crop science society, Uganda.

KIPPRA (2004) *Sources and Determinants of Agricultural Growth and Productivity In*

Kenya,KIPPRA Discussion paper no.34,KIPPRA, Nairobi, Kenya.

Kumba, F. F, (2003*) Farmer participation in agricultural research and extension service in Namibia,* university of Namibia press, Windhock Namibia.

Lynn, F.J., (2012) *Lessons on scaling up; opportunities and challenges for the future,* international food policy Research institute Paper.

Manyong, V.M. Nindi, S.D. alene, A.gOdhiambo, G. D, Omanya, G., Mignonna, H.D., and Bokangu,M., (2008) *Farmer perceptions of imazapyr-Resortant (IR) Maize Technology on the control of striga in Western Kenya*; African Agricultural Technology Foundation, Nairobi, Kenya.

Mawusi,S.E.,(2004) *Farmers knowledge and perception towards a sustainable Adoption of Sugar beet in Kenya* ; A masters Thesis, Lund University, Sweden

Muller, C., Cramer, W., Hare, W.L and Campan, L. H, (2011) *Climate change risks For African agriculture*Pasdam institute for climate impact Research, Germany.

Murenga,H,M.(2010) *Socio-Cultural factors influencing farmers adoption of Organic Farming and agro-forestry in Mau East catchment Area in Nakuru, Kenya.* PhD Thesis, Egerton University. Kenya.

Nchinda, V.P, Ambe, T.E Nahelic, H. Lake, W., Che, M.A, Nkware, S.P Ngassam, S.B, and Njualem, D.K (2010) *Factors influencing the adoption intensity of improved yam (Dioscoreaspp). Seed technology in the Western highlands and high guinea Savannah zones of Cameroon.* University of discharge press, Cameroon.

Ndou P. (2012) *Non Governmental Organization (NGOs) and beneficiary participation in agricultural development projects,full length research paper*. University of Fort Hare Press, South Africa.

Nelson, C. G, (2009) *Agriculture and climate change*; *An agenda for Negotiation in Copenhagen, brief I of vision 2020 for food, Agriculture, and the environment*

Nsabimanna, J.D., and Masabo, F.M. (2005) *Factors influencing adoption of agricultural technologies in Kiruhura District of Rwanda*, A paper in African crop science conference proceedings, Vol7 African crop science society, Rwanda.

Olwande, J. and Mathenge, M.,(2011) *Market participation among poor rural households in Kenya*, WpS 42 Tegemeo institute of Agricultural policy and Development, Nairobi, Kenya.

Pray, C., Gisselquist, D. Nagarajan, L.(2011) *Private Investment in Agricultural Research*

and Technology Transfer in Africa, Conference working paper 13 for ASTI/IFPRI-FARA conference Accra, Ghana December 5 – 7, 2011.

Rajalahti, R., Janssen, W. and Pehu, E. (2008*) Agricultural innovation systems from Diagnostics toward operational practices, Agriculture and rural Development Discussion paper 38,* International Bank for Reconstruction and Development and the World Bank, Washington DC, U.S.A.

Republic of Kenya, (2007) *The third annual progress report (2005 – 2006) for the Economic Recovery strategy (2003- 2007)* Government printers, Nairobi, Kenya.

Republic of Kenya (2009*) Strategic Plan for Agriculture 2008 – 2012*, government printers, Nairobi, Kenya.

Republic of Kenya, (2009) *Bungoma South District Development plan 2008 – 2012, Kenya vision 2030 towards globally competitive and prosperous Kenya* government printers, Nairobi, Kenya.

Republic of Kenya (2010) *The 2009 Kenya population and housing census; counting our people for the implementation of vision 2030; volume 1 B*: *population distribution by political units* Kenya National Beaureau of statistics, Nairobi, Kenya.

Rogers.E.M. (1995) *Diffusion of Innovations, 4h edition,* New York Free press, New York USA.

Rogers,E.M., (2003) *Diffusion of innovations5th edition.* New York Free Press, New York. USA.

Scoones, I. (1999) *Sustainable Rural livelihoods*; A framework for Analysis, IDS working paper 72.

Stienen, J., Bruusma, W., and Neuman, F., (2007) *How ICT can make a difference in agricultural livelihoods,article in The commonwealth ministers Reference book – 2007,* International Institute For Communication and Development, The Hague, Netherlands.

Smale, M., Byerle, D., and Jayne, T.S(2011) *Maize Revolutions in sub-Saharan Africa, Policy Research working paper 40,*Tegemeo Institute of Agricultural policy and Development and the World Bank, Nairobi, Kenya.

Sturdy, J.D, Graham, P.W. S, Lorentz, S.A (2010) *Building an understanding of agricultural innovation adoption processes through farmer driven experimentation*. University of Kwa-zulu Natal press.

Taylor, J. E (1998) *An exploratory literature review of Efforts to help the small scale,*

resource poor farmer in international agricultural development, PhD Thesis, State University press.

Toborn, J. (2011) *Adoption of Agricultural innovations, converging Narratives, and the role of Swedish Agricultural Research for Development*. Draft Discussion paper, version 2011-01-28.

Tiamiyu S.A., Kintola, J.O, and Rahji, M.A.Y, (2009) *Technology adoption and productivity Difference among Growers of New Rice for Africa in Savannazone of Nigeria.*IFPRI

Tolba, H. A. and Mourad, M. (2010) *Individual and cultural factors affecting diffusion of innovation,a concept paper.*

Wabbi, J. B. (2002) *Assessing Factors Affecting Adoption of Agricultural Technologies; The case of integrated pest management (IPM) in Kumi District, Eastern Uganda. A published masters Thesis,* State University Blacksburg, Virginia.

WEMA (2008) *Water Efficient Maize For Africa, Progress Report 2008-2011*

http//www.oneacrefund.org.One acre fund annual report of 2013, Accessed on 4th Dec 2013.

http//www.oneacrefund.org.One acre fund annual report of 2014, Accessed on 10th Jan 2014