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Empowering Youth Learning Organizations through Adoption of Ecological Agriculture in Kenya: Focusing on the Future

Benjamin Ouma Otiende

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Main Supervisors:
Prof. Geir Lieblein and Dr. Paul Abuom

ABBREVIATIONS

ABLH	-	Association for Better Land Husbandry
CARE-Kenya	-	Central American Relief Everywhere (Kenya)
CBOs	-	Community-based organizations
CSOs	-	Civil society organizations
FAO	-	Food and Agriculture Organization
FGD	-	Focus Group Discussions
ICIPE	-	International Centre for Insects Physiology and Ecology
ICRAF	-	International Centre for Research in Agro-forestry
IFPRI	-	International Food Policy and Research Institute
KOAN	-	The Kenya Organic Agriculture Network
KOFA	-	Kenya Organic Farmers Association
KII	-	Key Informant Interviews
MHAC	-	Manor House Agricultural Centre
MDGs	-	Millennium Development Goals
MFI	-	Micro finance Institutions
MV	-	Millennium Village
MVP	-	Millennium Villages Project
NALEP	-	National Agriculture and Livestock Program
N	-	Nitrogen (Nitrogenous Fertilizer)
OFF	-	Organic Food Federation
PLA	-	Participatory Learning and Action
SPSS	-	Statistical Package for Social Scientists

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ABSTRACT

Formal organic agriculture in Kenya dates back to the early 1980s when the first pioneer organic training institutions were established. Initial efforts to promote organic agriculture in Kenya were made by rural development and non-governmental organizations. The Kenyan government has not yet recognized the role of organic agriculture through its policies and could increase efforts to promote the sector. The emphasis of the study was to evaluate field experience of organic agriculture in Kenya while assessing whether the expected impact of such projects was indeed seen, and under what circumstances do initiatives either achieve all or some of these, fail completely or continue to flourish. The impact of organic agriculture on the youth was the particular focus. If there was evidence that some or all of these benefits are observed as a result of the implementation of organic agriculture. All these factors that guided the study were correlated to come up with the desired adoption model. The study identified the counties that practiced ecological agriculture and clustered them into agro-ecological zones given that generally, similar agro-ecological zones have similar agricultural practices and are likely to experience similar challenges. In using the case study approach, the researcher formed questions about the situation or problem to be studied and determined a purpose for the study. The study adopted Farming Systems Research which is an intellectual way of life, a concept of the nature of reality and how to investigate it. Farming Systems Research implies that a systemic approach is necessary so as to capture the 'logic' of the farming system, which allows us to understand the interactions between component parts. The study also adopted Participatory Learning and Action (PLA) which is an iterative and organic process which encourages stakeholders to engage in cycles of research, co-analysis, reflection and evaluation together over time. The study used stratified random sampling technique to draw a sample from the youth development organizations population. Five methods were used to collect the required data. They included literature review, focus group discussions, personal interviews, key informant interviews and telephone interviews. Secondary Data from surveys and reports (county agricultural reports, were used in the study to verify/qualify some of the findings. The study concluded that organic agriculture enabled young farmers to improve their production systems and productivity without the need for significant financial outlay. The study major recommendation is that training of youth and smallholders and the creation of new local and export markets will both, and jointly, favor agricultural intensification and growth. The study further recommends that there is need to create a network of supported Youth organizations that collaborate and compete amongst themselves to develop good practice/fields of excellence in youth and agricultural development.

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1.0 INTRODUCTION

Currently, organic agriculture is commercially practiced in 120 countries, representing 31 million ha of certified croplands and pastures (~ 0.7 percent of global agricultural lands and an average of 4 percent in the European Union) and 62 million ha of certified wild lands for organic collection of bamboo shoots, wild berries, mushrooms and nuts (Willer and Yussefi, 2007). Although difficult to quantify, non-certified organic systems (e.g. indigenous models that follow organic principles by intent or by default) of several million small farmers may represent at least an equivalent share in subsistence agriculture of developing countries.

The regions with the largest areas of organically managed agricultural land are Oceania (12.2 million hectares of 32 percent of the global organic farmland), Europe (11.2 million hectares or 30 percent of the global organic farmland) and Latin America (6.8 million hectares or 18 percent). On a global level, the organic agricultural land area increased by 0.5 percent or almost 200'000 hectares compared with 2011. 37.5 million hectares of agricultural land are managed organically by 1.9 million producers. The countries with the most organic agricultural land are Australia (12 million hectares), Argentina (3.6 million hectares) and the United States (2.2 million hectares). The highest shares of organic agricultural land are in the Falkland Islands (36.3 percent), Liechtenstein (29.7 percent), and Austria (19.7 percent). As of the end of 2012, 11.2 million hectares in Europe (EU: 10 million hectares) were managed organically by more than 320'000 farms (EU: more than 250'000). 2.2 percent of the European agricultural area is organic EU: 5.4 percent) (Willer and Yussefi, 2007).

In Africa there are slightly more than one million hectares of certified organic agricultural land (i.e. 3% of total), but another 11 Million ha of land for wild collection and beekeeping (i.e. 35% of total). The Number of producers was estimated at 541,000 in 2011. The African Countries with most organic land are Uganda (228,000 hectares), Tunisia (178,500 hectares) and Ethiopia (140,500 hectares) (Willer *et al*., 2013). Certified Organic agricultural land increased significantly in East Africa Between 2007 and 2011 at an annual rate of 14%, 5%, 1% and 14% respectively. No Less than two thirds of East African Organic production comes from Uganda (65% of total hectares in 2010) and one third (33%) from Tanzania. Production is negligible, percentage wise, in Kenya (1%), Rwanda (1%) and Burundi (0%). The vast majority of produce

in Africa is destined for export markets particularly in Europe (Willer *et al*., 2013). Local Markets for organic produce are developing in most African capitals. Within East Africa, local organic markets are most developed in Uganda, Tanzania and Kenya, but the certified organic volumes traded are only a fraction of total produce. Local Markets are important, however, for the sale of organic non export crops. These Products may be labeled, for example with the East African Organic Mark Established in 2007, but usually they are sold locally as a conventional crop at the market price of the day (Willer *et al*., 2013).

In Africa, certified organic lands cover 890 504 hectares (or 0.12 percent of agricultural lands), involving mainly permanent crops such as olives, tropical fruits, nuts, coffee, cocoa but also cotton, herbs/spices, etc. The sector employs 124 805 farmers in 24 countries and Uganda have the world's biggest number of organic farmers. The main countries with certified organic farms are: Sudan (200 000 ha and 650 farms), Kenya (182 586 ha and 15 815 farms), Uganda (182 000 ha and 45 000 farms), Tunisia (143 099 ha and 515 farms), Tanzania (38 875 ha and 43 791 farms) and Zambia (2 884 ha and 9 248 farms). Most certified organic production is geared toward export markets, mainly the European Union. Also, Africa counts 27 million certified wild areas - in Kenya, Zambia, South Africa, Namibia and Uganda - which export organic products such as sheabutter, roseship, gum Arabic, argan oil and honey bush. This represents a tiny part of a large collection potential. In Africa, organic agriculture is rarely certified, due to lack of access to lucrative markets. The continent, however, offers a potential basis for the development of non-certified organic agriculture, based on improved agro ecological management of traditional African agriculture, which is a de facto low external input system, practiced by smallholders who cannot afford expensive technologies and who lack functioning markets (KOAN report, 2014).

Formal organic agriculture in Kenya dates back to the early 1980s when the first pioneer organic training institutions were established. At the same time, a few horticultural companies started growing organic vegetables for export. Initial efforts to promote organic agriculture in Kenya were made by rural development, non-governmental organizations (NGOs), faith-based organizations, individuals and community-based organizations (CBOs), who sought to help rural farmers address the issues of declining agricultural productivity (especially the degradation of

soils and the natural resource base), high poverty levels, food insecurity and low incomes, which prevented farmers from accessing high cost inputs.

Organic farming was seen as a low cost approach to mitigate the above situations. This "poor man" image of the organic sector, especially among NGOs, continues to this day and may have contributed to the low-level of commercialization of the organic sector at the smallholder level. The organic sector is relatively small but fast growing and led mainly by civil society organizations (CSOs) and the private sector (companies growing organic produce for export).The government has not yet recognized the role of organic agriculture through its policies and could increase efforts to promote the sector. Organic products mainly vegetables and fruits produced on large-scale farms have been exported from Kenya over the past two decades. Over the years, exports have developed beyond vegetables and fruits to include other products such as essential oils, dried herbs and spices, as well as products for the cosmetic and pharmaceutical industries which are more often produced or collected by smallholders.

Organic agriculture has an important role to play in addressing food security given its suitability for smallholder farmers in particular. Organic agriculture is defined as: "a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to Local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved." (IFOAM, 1997). Organic agriculture is generally assumed to cater to a luxury niche whose customers can afford to shop in health food, rather than hard discount, stores. While that may once have been true, the reality today is that organic supply is now the world's fastest-growing food sector, increasing at 15 percent a year over the last decade and worth some 40 billion dollars in 2006 (or 2 percent of food retails). Consumer studies too reveal that organic buyers are not so much better-off as generally more aware of food issues (e.g. educated middle age women with children) (Okuro *et al.,* 2002).

1.1 Background of the study

There are currently almost 1 billion hungry people in the developing world, the majority of which are smallholder farmers and rural poor. Hunger is an entrenched problem in which at least three quarters of a billion people have been hungry each day of the last three decades or more despite sufficient food production on a global level. The reasons for this are complex but ultimately they have been systematically locked out of development with few rights and little access to resources. Due to poverty and relative exclusion from cash based economies they, like many urban poor in developing countries, can also not afford to purchase food.

Organic agriculture has developed and guidelines have been detailed in writing over the last 50 years. Since the early 1990s the term 'organic agriculture' has become legally defined in a number of countries. It has its roots in the variously named biodynamic, regenerative agriculture, nature farming and perma-culture movements which have developed in different countries. Numerous adaptations of the guidelines have taken place, but the common understanding is that: 'practicing organic agriculture involves managing the agro ecosystem as an autonomous system, based on the primary production capacity of the soil under local climatic conditions' (Place *et al*., 2005).

Agro ecosystem management implies treating the system, on any scale, as a living organism supporting its own vital potential for biomass and animal production, along with biological mechanisms for mineral balancing, soil improvement and pest control. Farmers, their families and rural communities, are an integral part of this agro ecosystem. 'Both sexes are involved on equal terms' (UNDP, 1992). Some would argue that organic farming is the agricultural expression of what was finally recognized in Rio and pre-dated it by about 50-60 years. Though organic practitioners may claim that they saw the future, and they are finally being rewarded by the industry boom in the last 5-10 years, organic agriculture is still considered by many as an interesting niche market to be exploited rather than an agricultural system with wider benefits (FAO, 2003).

1.2 Justification of the Study

The study was intended to enable a more informed and responsible approach to ecological agriculture interventions in Kenya and beyond. By identifying the factors that determine the major organic agricultural activities that the youth engage in and enhance employment while reviewing the performance of youth training organizations implementing organic agriculture programmes and how this could be improved to enhance income generation for the youth. Equally establishing the gender dimensions in organic agriculture and factors hindering entry of youth into organic agriculture were sought. The study findings sought to increase the understanding of more strategic organic agriculture interventions and farming systems. However without ecological Agriculture adoption, sustainability of every effort may not be realized. It therefore becomes crucial to identify the factors that would enhance ecological agricultural adoption. The recommendations will further be instrumental in policy development especially those geared towards improvement in ecological agriculture and improved livelihoods.

1.3 Aim of this study

The aim of this study was to evaluate field experience of organic agriculture in Kenya while assessing whether the expected impact of such projects is indeed seen, and under what circumstances do initiatives either achieve all or some of these, fail completely or continue to flourish. The impact of organic agriculture on the youth was the particular focus. If there was evidence that some or all of these benefits are observed as a result of the implementation of organic agriculture, what, if any, 'recipe' of circumstances, design, implementation and funding can be determined? Can guiding principles be developed to assist the operators, advisors and potential donors and investors to increase the chance of success?

1.3.1 Basis of study

The study is based on the practical experience of organic agriculture initiatives derived from published and grey materials including interviews and contacts with key personnel. The study was prepared over six weeks in August to September 2013 and consisted of the following steps:

i. Contact with organic certification programmes in Kenya and their licensees
ii. Contact with advisors and consultants working in this field
iii. Contact with development organizations
iv. Collection of documents and resource materials

v. Selection of case studies for further investigation
vi. Review of project structure and impact
vii. Interviews with key personnel
viii. Summaries of the lessons learned

1.4 Scope and Limitations

The study was limited to Homa Bay and Trans Nzoia Counties where the organic agriculture interventions focusing on the youth have been carried out. Some respondents (7) were also not willing to respond to any question demanding compensation for being used and this caused a limitation of the intended sample size. The initial sample of 150 was not feasible as some respondents felt they were not ready to give any more information having been ‘used’ over the years without any tangible gain. The number of respondents achieved was 143 against the intended 150 since some respondents refused to respond (7).

2.0 LITERATURE REVIEW

Efforts by Kenya to achieve international targets within the framework of MDGs as well as the national policy objectives contained in the medium development plans and the vision 2030 need to rally the potential of the youth as a very significant demographic group. Organic Agriculture provides the single most important platform for expansion of employment, income generation and food security in Kenya. About 65% of the Kenyan population lives in rural areas, with 70% of rural respondents dependent on main stream agriculture as their main livelihood pillar. The agriculture sector holds an important key to poverty reduction through increased productivity, value addition, improved marketing and linkages to other sectors. Agriculture has largely remained unattractive to young people – men and women- for a variety of reasons (Mango, 2000). The Youth constitute one key demographic domain of poverty. Whereas, there is a good body of knowledge on poverty as a dimension of contemporary economic development, increasingly coming into policy attention is the growing economic, social and political disempowerment of the youth. Failure to exploit the opportunities provided by the "youth bulge" not only shuts down a key economic window to national development, but predisposes society to political and social instability (Okuro *et al.,* 2002). The following key sub-sectors can be improved to empower the youth;

2.1 Agricultural Sub-sectors

Food Crops: Food crops are classified into cereals (maize, wheat, sorghum, rice, millet); pulses (beans, pigeon pea, cowpea, chickpea, green grams); and, roots and tubers (sweet potato, Irish potato, cassava, arrow root and yam). The main food crops are maize, rice, wheat, sorghum, potato, cassava, vegetables and beans. Maize and beans are the dominant food crops grown in all the counties visited. Apart from Uasin Gishu which grows a lot of maize, no other county is self-sufficient in the same. In addition, Kenya imports about 50% of the rice and 33% of the wheat consumed in the country. These are investment opportunities that can be exploited by the youth including establishing predictability of both the production and marketing of the commodities (GoK, 2004).

Industrial Crops: The main industrial crops in Kenya are tea, coffee, sugar cane, cotton, sunflower, pyrethrum, barley, tobacco, sisal, coconut and bixa, all of which contribute 55 per

cent of agricultural exports. Tea is still one of the leading foreign exchange earners in the country. Declines have recently been recorded in several industrial crops, among them pyrethrum and sugar cane. Other commercial crops whose production has remained low despite large unexploited potential are cotton, pyrethrum, oil crops, cashew nut, bixa and sisal (GoK, 2004). Sufficient investment in the revival of these crops especially cotton can create many job opportunities for the youth in the country right from production of cotton seed, growing of cotton for seed cotton to ginning, spinning and production of garments for local use and export. What appears to lack in these sub-sectors is serious leadership and financial allocation. With proper coordination, even nongovernmental development agencies can pick a commodity of their choice and concentrate their efforts on it by developing the whole value chain, engaging the youth appropriately all along (GoK, 2004).

Horticulture: Products in this sector include cut flowers, vegetables, fruits, nuts, herbs and spices. The value of horticultural exports has been growing at an average of 16 per cent rising from KES 26.6 billion in 2002 to KES 43.3 billion in 2006 and to KES 65.2 billion in 2007. The quantity of horticultural exports fell by 33.7 thousand tones while the value declined by KES 9.0 billion in 2010. This decline in horticulture was partly attributed to interruptions of air traffic to European countries by volcanic eruption in Iceland (GoK, 2011). The youth prefer commodities that generate high and quick returns on a regular basis so that they can have an income the whole year round. Production of high value horticultural crops for local consumption and exports offer enormous opportunities for involving the youth. This could be combined with livestock enterprises that could provide the continuity in income. For examples vegetable growing and poultry (layers): the crop could provide an income every three months while the layers generate income on daily basis. With proper and sufficient capacity building, other youth could take on the processing/marketing responsibilities to ensure efficient marketing (GoK, 2004).

2.2 Production Scales

Small-Scale Farming: Kenya's agriculture is predominantly small-scale mainly found in the high agricultural potential areas. Production is carried out on farms averaging 0.2–3 ha, mostly on a commercial basis. This small-scale production accounts for 75 per cent of the total agricultural output and 70 per cent of marketed agricultural produce. Small-scale farmers produce over 70 per cent of maize, 65 per cent of coffee, 50 per cent of tea, 80 per cent of milk, 85 per cent of

fish, and 70 per cent of beef and related products. However, adoption of improved inputs such as hybrid seed, concentrate feeds, fertilizer, safe use of pesticides and machinery by small-scale farmers is relatively low. There is huge potential to increase productivity in the small holder subsector with adoption of appropriate and modern farming practices. In the rangelands, the small-scale livestock production system features mainly pastoralists. Livestock herd sizes are considerably large because of communal grazing with low use of purchased inputs like feed, drugs and artificial insemination. Production is mainly for subsistence and cultural reasons rather than market oriented (GoK, 2004).

Medium-Scale Farming: Medium-scale farms range from 3 to 49 ha. Farmers in this category are receptive to technology and practice commercial agriculture by investing in inputs, marketing produce and borrowing credit for farm development. Youth can also adopt a similar model by working together on larger areas of land to maximize on the economy of scale. Small scale communities can also agree on one or two crops only so that they can easily pool produce for easy of marketing (GoK, 2004).

Large-Scale Farming: Large-scale farming is practiced on farms averaging about 50 ha for crops and 30,000 ha for livestock ranches. The large-scale farming subsector accounts for 30 per cent of marketed agricultural produce, mainly involving growing crops such as tea, coffee, maize and wheat in addition to keeping livestock for commercial purposes. The use of improved technologies and better farm management has resulted in increased productivity per land unit in all categories of farming. There are some large farms in various parts of the country that are not farmed at all. The government and other development agencies should consider either acquiring some of the farms or leasing them from the owners so as to sub-let to youth for efficient farming and employment creation. In such case: provision of production information, processing and marketing of produce can be done optimally. An example in the Trans Nzoia region could be leasing like 9,000 acres of land and sub-letting it to 3,000 youth (3 acres per youth) to grow a crop like maize and beans only. In such a case, land preparation could be done jointly, the inputs could be provided on loan and all that the youth invest is their labour and management. This model of farming could be piloted in a few counties by interested agencies (GoK, 2004).

2.3 Production factors and Access to Information

Experience demonstrates that a host of factors will influence the success and rates of organic agriculture adoption. These factors include farmer or respondents characteristics (wealth, age, gender, labor availability), farming system characteristics (land and livestock holdings, slope, access to irrigation), resource access (social networks, planting material, information), properties of organic agriculture itself (how quickly it generates returns, required capital and labor investments) and farmer access to social networks (Adamo *et al*., 2001).

A study by Ryan and Gross, (1997) used a retrospective survey method to model the diffusion of corn in Iowa, sought to correlate innovativeness (the time of adoption) with a number of variables such as the adopter's age, education, farm size, income and access to diverse information sources. The study found out that the less educated the individual, the less chances of adoption of any technology and less access to information. Additionally, respondents with smaller farm sizes tend to become involved in other off-farm activities for income and food and neglect the farms at home. In Nepal, a respondent's survey was conducted using a cross sectional data design. The collected data used descriptive statistics and the findings revealed that timely credit availability, timely field operations, extension service, farm size, off-farm income and experience of farmers significantly influenced adoption decisions (Karki and Bauer, 2004).

Productivity in organic systems is management specific. Studies suggest that switching to organic management commonly results in yield reduction in perennial crops (up to 50 percent) and during the conversion period for high external input systems in areas with favourable crop growth conditions (up to 40 percent). However, in regions with medium growth conditions and moderate use of synthetic inputs, organic productivity is comparable to conventional systems (92 percent) and in subsistence agricultural systems, organic agriculture results in increased yields up to 180 percent. Overall, the world average organic yields are calculated to be 132 percent more than current food production levels (Badgley, *et al*., 2006). In Africa, conversion to organic agriculture was estimated to increase productivity by 56 percent by 2030.

Established organic agriculture, in which soils and biodiversity have been nurtured over time and the system has balanced out, is generally considered to be an ideal agricultural production system for sustainability. Organic agriculture has been criticized for issues of productivity, price and

feasibility, but it is generally applauded for its Sustainability impacts. Organic agriculture has many positive system impacts compared to conventional depending on the situation before conversion, and the degree of the 'organic system optimization': The soils hold substantial organic matter, are well aerated and have good structure, which provides them with a high water storage and retention capacity. This is of particular importance during drought periods, and in view of climate change (Adamo *et al*., 2001).

The production system is diverse, thus creating a multitude of ecosystems at micro level, which is beneficial to general biodiversity. The more biodiversity, the less likely it is that one single pest or disease will affect farm production substantially. The diversity of the cropping system relates to the number of species and varieties (horizontally), as well as to the integration of trees, shrubs, crops and soil cover crops (vertically); Trees and crop production are generally integrated, thus enabling the uptake and recycling of nutrients for different soil layers, while providing multiple additional services to flora and fauna (fruits, shadow, humidity, organic matter from leaves, soil cover, wind break, nesting sites for birds and insects, etc.(Badgley, *et al*., 2006). It should be noted, however, that organic farms in East Africa and beyond may well not (yet) have an "optimized system". For example, the quality of Organic fertilizing practices may differ widely between smallholders in terms of the amount of nutrients added, because of limitations in access to manure, compost, transport or labor. Abundant diversity is also not guaranteed on certified organic farms; organic fields can sometimes be as mono cropped as are conventional ones. Because of this, organic proponents tend to distinguish in practice between "fully organic" farms (which are close to ideal in terms of diversity) and "certified organic" farms (which only meet the minimum criteria for organic certification). This is a distinction to take into account also for future organic comparative research (Adamo *et al*., 2001).

2.4 Youth Training in Organic Agriculture

Youth development is the process of growing up and developing one's capacities in positive ways. This typically takes place in the context of the family, the peer group, the school, and the neighborhood or community. Many young people do not have the advantages that promote optimal, healthy development of the body, mind, and spirit. Many youth do not have opportunities to experience positive stimulation for growth or nurturing support from family, friends, and community. Youth development is a natural process, but it cannot be left to chance

(Pittman, 1993). A youth development organization exists to promote the positive, healthy development of young people. Youth development organizations are different from agencies and systems that exist to provide social control, treatment, or training for young people.

The socialization of youth is the youth organization's primary task (Pittman, 1993). Their mission is to provide the challenges, experiences, support, and help young people need to develop to their fullest potential. These community-based organizations work to meet needs in the environment and enhance the learning experiences of young people. No single organization does it all. Youth development organizations involve young people of all ages and both sexes, although some target certain audiences. They encourage long-term involvement and provide a progression of activities promoting developmental growth. It is not an alternative to formal education offered in the schools; it is another kind of education essential for helping young people growth to optimal maturity. The schools that provide formal education are "society's most legitimate and formal system of teaching and learning" (LaBelle, 1981, p. 315). They are typically chronologically graded and hierarchically structured. They offer credits, grades, and diplomas to document learning and achievement. Increasingly, schools are asked to document more closely the competency of their learners as proof that the credits, grades, and diplomas have real value.

When curriculum is defined as any planned sequence of learning experiences, (Schneider, 1983), a curriculum for youth development education has two major components. First, the curriculum has content or subject matter upon which the planned sequence is built. Second, the curriculum has a method or a set of principles that guides the design of the learning experiences. The synergy of content and method promotes learning and competence in life skills critical for the healthy development of young people. Experiential methods of learning are most commonly associated with youth development education programs in non-formal settings. These emphasize exploration and critical thinking and focus not only on learners doing work, but on sharing, processing, analyzing, and applying the understandings or skills gained (Lussier, 2002).

According to Armstrong, (2008) effective training can also improve morale and increase an organization’s potential. Poor, inappropriate, or in-adequate training can be source of frustration for everyone involved. Training is the planned and systematic modification of behavior through

learning events, programs and instructions, which enable individuals to achieve the levels of knowledge, skill and competence needed to carry out their work effectively. Training involves a set of activities that provide learning opportunities through which people can acquire and improve job-related skills (Schermerhorn, 2002). As Irene, (2007) indicated in the findings of her research that "for any training to make a contribution to the needs of an organization or an individual, it must be based on clear analysis of issues it aims to address". The terms training and development are often used together, and interchangeably as well (Lussier, 2002).

2.4.1 Training

According Khanka, (2007) training is the process of teaching the new and or present youth the basic skills they need to effectively perform their jobs. Alternatively speaking, training is the act of increasing the knowledge and skill of an employee for doing the job. Thus, training refers to the teaching and learning activities carried on for the primary purpose of helping members of an organization to acquire and also to apply the required knowledge, skill and attitudes to perform their jobs effectively. Saakshi, (2005) defined training as an experience in that it seeks a relatively permanent change in an individual that may improve his or her ability to perform on the job. We typically say training can involve the changing of skills, knowledge, attitudes, or social behaviour. It may mean changing what youth know, how they work, their attitudes toward their work, or their interactions with their co-workers or their supervisor. Gomez-Mejia & Balkin, (2002) elaborate that training is a planned effort aiming at providing youth with specific skills to improve on their performance. Scientific data support the assertions of these and others that, in the absence of skill training, performance in school are not predictive of subsequent career success. The studies of the relationship between performance in courses and subsequent life success show that, life success was measured in these studies by a variety of factors, including job performance, income, promotions, personal satisfaction, eminence and graduate degrees (Whetten & Cameron, 1998). Training is the planned and systematic modification of behavior through learning events, programs and instructions, which enable individuals to achieve the levels of knowledge, skill and competence needed to carry out their work effectively (Armstrong, 2008). Julie Beardwell, (2007) defines training as a set of activities which react to present needs and is focused on the instructor and contrast with learning are developed and the achievement of organizational potential and building capabilities for the future. Area of training

are, Knowledge: Training aimed at imparting knowledge to youth provides for facts, information and principle related to the knowledge area.

Technical skill: The training in this area aimed at teaching the youth the physical acts or actions like operating machine, working with a computer, using mathematical tools to take decisions, and others. It is somewhat like induction training.

Social skills: The training in this area is broader in scope embarrassing many aspects. This category of training aims at the development of individuals and team work. Accordingly, youth are imparted training to acquire and sharpen such behavioural and human relations skills that help improve inter-personal relationship, better teamwork and effective leadership.

Techniques: Training in this area involved teaching youth the manners how to apply knowledge and skills to dynamic situations.

Attitudes: This involved orientation or induction programmes that help change the youth's attitudes favorable toward the achievement of organizational goals. Through training programmes youth's attitudes are molded to render support for the effective completion of company activities and inculcate the spirit of better co-operation and greater loyalty among the youth.

Experience: It is not and cannot be taught or imparted in the classroom, it is gained by putting knowledge, skills, techniques and attitudes into use over a period of time in different work situations. Experience makes one perfect.

The beginning of the modern day concept of the training could be traced far back to the Stone Age when people used to transfer knowledge in particular activity through sign and deeds to others. It was only during the industrial revolution that the formal and vocational training was started to instruct the experiences about the operation of machines. Since then, there is no looking back in this regard. Today, training has become the most important organization activity not only in the business organization but in the educational institutions also. It is a fact that many organizations have realized the need for training, created infrastructure and provided financial support. However, the results of many training programmes have been far less than the desired ones.

2.4.2 E-Learning

E-learning was defined by Pollard and Hillage, (2001) as the delivery and administration of learning opportunities and support via computer, networked and web- based technology to help individual performance and development. The different types of e-leaning include Self- placed e-learning when the learner is using technology but is not connected to instructors or other learners at the same time.

Live e-learning in which by the use of technology, the instructor and the learner are together at the same time but in different locations. Collaborative e-learning, which supports learning through the exchange and sharing of information and knowledge amongst learners by means of discussion forums, communities of practice, bulletin boards and chart room. E-learning's biggest technical obstacle to more widespread use is bandwidth. High speed, dedicated internet connections are still a luxury for many people. When youths are parked in front of standard dial-up- connection: downloads of a course's sound, video, and detailed colour photographs takes away too long. Under those circumstances, interest wanes, along with motivation. Personal concerns are another potential obstacle. Following classroom training, it is unusual for youth to state emphatically that the best part of learning experience was the network of personal relationships they developed in the course of their training. That kind of camaraderie doesn't form as easily with e-learning (Wayne F, 2006).

In the words of Pollard and Hillage, (2001) the objective is to provide for learning that is 'just in time, just enough and just for you'. It enables learning to take place when it is most needed ('just in time' as distinct from 'just in case') and when it is most convenient. Learning can be provided in short segments or bites that focus on specific learning objectives. It is 'learner- centric', can be customized to suit an individual's learning needs and learners can choose different learning objects within an overall package. The basic principle of e-learning is connectivity.

In this process, computers are networked, information is shared and people connect to people and are provided for by what is often called 'the e-learning landscape or architecture' which refers to the hardware, software and connectivity components required in facilitating learning. In a sense blended e-learning is balanced learning in that a balance needs to be struck between electronic learning, face to face learning and formal group learning through teams and

communities of interest. According to Bateman and Snell, (2002) E- learning over net via the virtual classroom is dramatically changing management education and training. Students are comfortable with the E- Learning and enhance learning by extending and supplementing face to face learning rather than replacing it. In its fully developed form, e-learning is more comprehensive approach to learning than the earlier developments, especially when blended with other learning methods.

2.4.3 Simulation, Case Study and Role Playing

Simulation is a special training technique conducted on duplicate environment which is mock-up of real-life environment (Saakshi, 2005). Under the simulation method, a single hour may be equated for a month, or a quarter of a month in a real life. Like this, several events may be experienced in a relatively short span of time. Simulation is a use-full technique of executive development because the decisions taken are reversible and less costly to the enterprise. One long-standing deficiency of the simulation technique was that it is difficult to duplicate the reality of actual decision making on jobs. Simulation: devices or situations that replicate job demands at an off-the-jobsite. Organizations' often use simulations when the information to be mastered is complex; for example, the airline industry has long used simulators to train pilots (Gomez *et al*., 1995). Simulation is a training technique that combines case studies and role playing to obtain the maximum amount of realism in classroom training. The aim is to facilitate the transfer of what has been learnt off the job to on -the- job behavior by reproducing, in the training room, situations that are close as possible to real life. Trainees are thus given the opportunity to practice behavior in conditions identical to or at least very similar to those they may meet when they complete the course. An employee relation is concerned with preventing and resolving problems involving individuals which arise out of or affect work situations. Information is provided to youth to promote a better understanding of management's goals and policies.

A case study is a history or description of an event or set of circumstances that is analyzed by trainees in order to diagnose the causes of a problem and work out how to solve it. Case studies are mainly used in courses for managers and team leaders because they are based on the belief that managerial competence and understanding can best be achieved through the study and discussion of real events (Julie Beardwell, 2007).

According to Wayne F, (2006) Case studies method involves diagnostic and problem solving study of usually a written description of the some event or set of circumstances on organisation problems providing relevant details. The method is appropriate for developing analytical and problem solving orientation and skill, providing practice in applying management concepts, tools and techniques and enhancing awareness of the management concept and processes. The method is relevant for developing organisational, conceptual and functional skills among top and senior level executive.

According to Khanka, (2008) Case studies should aim to promote enquiry, the exchange idea, and the analysis of experience in order that the trainees can discover underlying principles that the case study is designed to illustrate. They are not light relief. Nor are they a means of reducing the load on the instructor. Trainers have to work hard to define the learning points that must come out of each case, and they must work even harder to ensure that these points do emerge. The danger of case studies is that they are often perceived by trainees to be irrelevant to their needs, even if based on fact. Consequently, the analysis is superficial and the situation is unrealistic. It is the trainer's job to avoid these dangers by ensuring that the participants are not allowed to get away with half-baked comments.

Trainers have to challenge assumptions and force people to justify their reasoning. Above all, they have to seize every chance to draw out the principles they want to illustrate from the discussion and to get the group to see how these are relevant to their own working situation.

In role playing, the participants act out a situation by assuming the roles of the characters involved. The situation may be one in which there is interaction between two people or within a group. It should be specially prepared with briefs written for each participant explaining the situation and broadly, their role in it. Alternatively, role playing could emerge naturally from case study when the trainees are asked to test their solution by playing the parts of those concerned. Role-playing is used to give managers, team leaders or sales representative practice in dealing with face to face situations such as interviewing, conducting a performance review meeting, counseling, coaching, dealing with a grievance, selling, leading a group or running meeting. It develops interactive skills and gives people insight into the way in which people behave and feel (Chuck, 2002).

The technique of ‘role reversal’, in which a pair playing, say, a manager and a team leader run through the case and then exchange roles and repeat it, gives extra insight in to the feelings involved and the skills required. Role playing enables trainees to get expert advice and constructive criticism from the trainer and their colleagues in a protected training situation. It can help to increase confidence as well as developing skills in handling people. The main difficulties are either that trainees are embarrassed or that they do not take the exercise seriously and overplay their parts.

Simulation methods: Simulation is a technique which duplicates, as nearly as possible the actual conditions encountered on a job. These methods have been most widely used in the aeronautical industry. The methods falling under this category are discussed as follows:

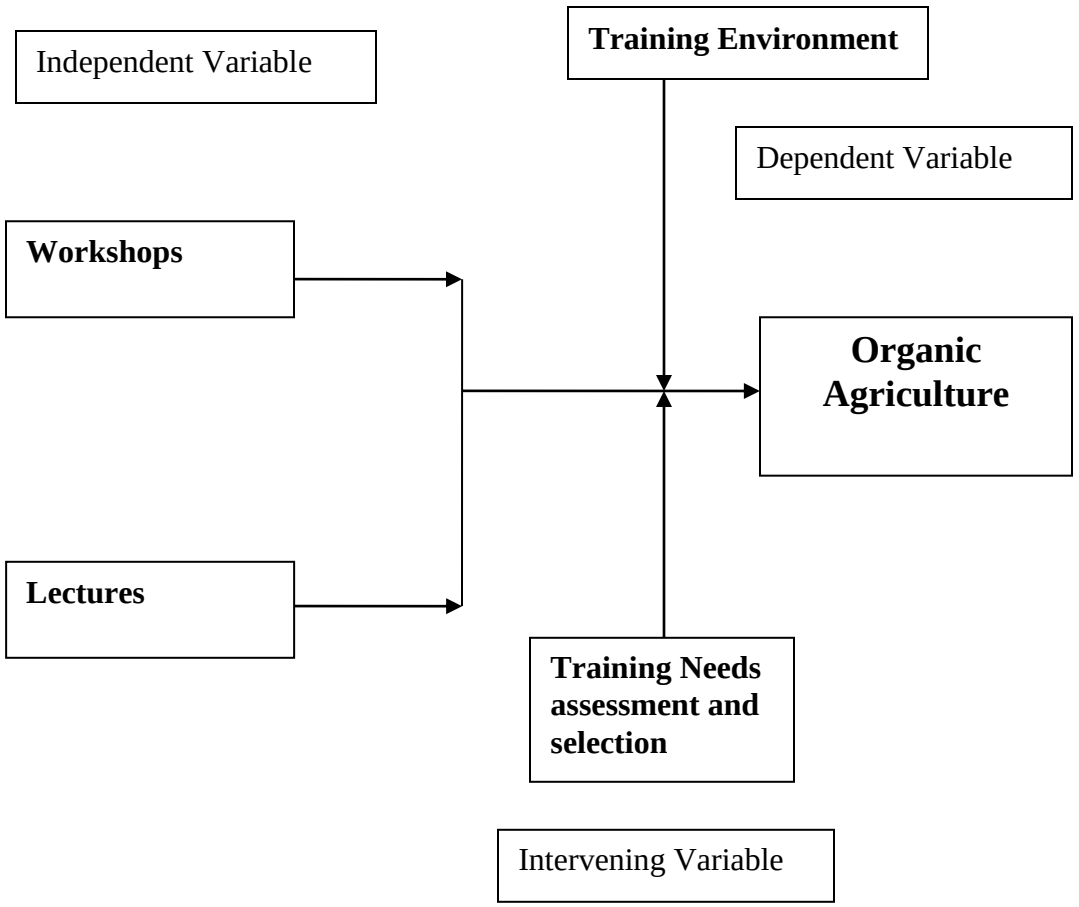
Role play: this is just like acting out a given role as in a stage play. In this method of training, the trainees are required to enact defined roles on the basis of oral or written description of a particular situation. This method is mostly used for developing interpersonal interactions and relation among the youth working in sales, marketing, purchasing, and supervisors who deal with people.

Case Method: The case is an actual event or situation on organizational problems which is a written description for discussion purpose. Trainees are asked to analyze the event or circumstances with an objective to identify the problem, trace out the causes for it and find out the solution to solve the problems. This method of training is based on this realization that, on many occasions in the real world, managers may not have all the relevant information with them before taking a decision. This is also called decision making under uncertainty. Therefore, this method is suitable for developing decision-making skills among the top and senior level managers.

2.4.4 Conceptual Framework

The conceptual framework below depicts that if small groups of people meet together over a short period of time to concentrate on a defined area of concern, the chances of adopting and applying such a concern would be a lot easier. The obvious step in building better teams is to

have teams practice using teamwork skills in facilitated workshop settings, increasing the likelihood they may use these skills in the work setting. Lectures: this is the way instructors have control over the situation and can present the material exactly as they desire. Although the lecture is use-full for presenting facts, its value in changing attitudes and teaching skills is somewhat limited. Simulation is a training technique that combines case studies and role playing to obtain the maximum amount of realism in classroom training. The aim is to facilitate the transfer of what has been learnt by reproducing, in the training room, situations that are close as possible to real life. Trainees are thus given the opportunity to practice behaviour in conditions identical to or at least very similar to those they may meet when they complete the course. This would in turn translate to better adoption and practice of organic agriculture practices.



Source: Author 2014

Figure 2. 1: Conceptual Framework

3.0 METHODOLOGY

3.1 Scope of the Study

The study team identified the counties that practiced ecological agriculture and clustered them into agro-ecological zones given that generally, similar agro-ecological zones have similar agricultural practices and are likely to experience similar challenges. A total of two agro ecological zones were identified from which a random sample of one youth development centre per zone was selected. The field study was subsequently carried out in the following regions that included Homa Bay and Trans Nzoia Counties. Though the youth constitute distinct demographic groups, for the purposes of this study we consider high levels of unemployment experienced by the group as a common denominator. Kenya's constitution defines youth as all individuals in the republic who are between 18 and 35 years. Currently, 78 % of Kenyans are below 34 years old. It is estimated that 64% of unemployed persons in Kenya are youth. 8 % of the unemployed youth have formal education beyond secondary school level and the remaining over 92% have no vocational or professional skills training and the majority are found in rural Kenya [UNDP:2009 Kenya Human Development Report].

Due to inadequate employment and livelihood opportunities in rural areas the tendency is that they migrate to urban centres to look for such opportunities. It is envisaged that Kenya will experience a demographic shift/transition due to changing patterns in fertility, mortality and population growth as well as socioeconomic factors. As the 0-14 age group matures into teenage-hood and young adulthood, and as many women continue to give birth later, space their children more or give birth to fewer children, the bulge will shift to the 15-34 year olds meaning that Kenya will transition from a 'child-rich' phase/child bulge to a 'young adult' / youth bulge population [Njonjo, K.S, 2010]. Youth statistics currently show the following facts: Over two and half million youth in Kenya are out of work. The most frequent explanations of the causes of youth unemployment in Kenya include slow or declining economic growth, rapid population growth, and poor dissemination of labour market information, skills mismatch, structural reforms, and high costs of labour. From a gender point of view, the disaggregation of unemployment rates by gender reveals that in both 1998/1999 and 2005/2006 employment survey that the unemployment rate for female youths was higher than that of males. The overall unemployment rate among females was 14.3 percent compared to 11.2 percent among males.

3.2 Case study Research

Case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. Case study research method is an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used (Yin, 1984). In using the case study approach, the researcher formed questions about the situation or problem to be studied and determined a purpose for the study. Then proceeded to investigate the object of the case study in depth using a variety of data gathering methods to produce evidence that leads to understanding of the case and answer the research questions. This research design allowed the researcher to adopt a holistic approach of the study sampled, thus enabling and utilizing research tools like Questionnaires, KII, personal interviews and Focused Group Discussion guides.

3.3 Farming systems Research

The study adopted Farming Systems Research which is an intellectual way of life, a concept of the nature of reality and how to investigate it. Farming Systems Research implies that a systemic approach is necessary so as to capture the 'logic' of the farming system, which allows us to understand the interactions between component parts. These include material objects (e.g. soils, plants, animals, buildings) as well as subjective perceptions, values and preferences. Farming Systems Research emerged to address a new set of questions where the dominant approaches to agricultural research were poorly focused (Beranger and Vissac, 1994; Bonnemaire *et al*., 2000; Brossier and Hubert, 2000; Colin and Crawford, 2000; Collinson, 2000; Collinson, 2001; Brossier *et al*., 2012). Farming Systems Research comes in many guises and labels (Dent and McGregor, 1994; Collinson, 2000; Doppler, 2000).

The focus on interactions also emphasize that a farm cannot be studied in isolation, but to understand the farming practices, the farm needs to be understood as embedded in a territory, a locale, a region, with its specific agro-ecological setting, economic opportunities and cultural values. When analyzing a farming system, at least three sets of interacting factors need to be taken into account: the various members of the farm family, with their individual preferences, projects and history; the farm with its resources and assets; and the environment which is

constituted by social networks, economic opportunities, political incentives and bio-physical context. This means that the farming system is understood as constructed by the farmer, while being dependent on material resources and structures. As such, a farming system is an emergent property of material conditions and social construction. Farming Systems Research is an approach which is used in all issues where farms play a role. As such, Farming Systems Research is usually situated in rural areas, but also reaches into urban areas, e.g. when studying agro-food networks. However, a territorial definition might not do Farming Systems Research justice, as it investigates how spatial, technical and social relations are constructed, represented, materialized and contested by a broad range of societal actors.

Fundamentally, Farming Systems Research implies that farming and related activities are understood as systems. Systems are about drawing attention to the relationship between elements, rather than focusing on specific elements and studying them in isolation. It is about interaction, entanglement, dependencies, exchange, connections, relationships and co-evolution. This is a key distinction from more traditional reductionist approaches to agricultural research, which focuses on analyzing separate parts of the system (e.g. animal nutrition, crop yield). Similarly, in reductionist approaches farmers are seen as discrete agents (i.e. each farmer takes her decisions independently), while Farming Systems Research seeks to understand how actors interact and influence one another (Röling and Jiggins, 1998).This holistic approach to farming involves exploring the complexity of interactions within the 'hard' system (the biological and technological components that can be modelled, particularly by simulation) and within the 'soft' system (the meaning that actors give to farming systems, now they make sense as biological and technological components).This focus on understanding the interconnections and multiple causes for a phenomenon, distinguishes farming systems from those approaches that focus on technological fixes, arguing that they will adequately address societal problems (Russell and Ison, 2000).

One of the characteristics of Farming Systems Research is the iterative character, involving researchers and stakeholders, the researcher ensured that all stakeholders within the youth training organizations participated in the study. The aim was less to find the 'right solution', but more to engage in an on-going participatory learning process. The research is thus an iterative undertaking, repeating itself throughout the research design, resolving research problems,

interpreting results, and determining conclusions. The study aimed at understanding and taking into account interdependencies and dynamics. The study sought to establish the interconnections between system's elements, its dynamics, and its relation with the environment. Whereas integrating societal actors in research is critical to understand 'real world' situations, to include the goals of various actors, and to appreciate their perception of constraints and opportunities. The study adopted a broad range of societal actors (farmers, agri-trainers, ministry of agriculture, and training officers) were involved in this study, and actively shaped the research process.

3.4 Participatory learning and Action

Participatory Learning and Action (PLA) is a form of action research. It is a practical, adaptive research strategy that enables diverse groups and individuals to learn, work and act together in a co-operative manner, to focus on issues of joint concern, identify challenges and generate positive responses in a collaborative and democratic manner. The researcher adopted this method because it is a pragmatic multi-perspectival research methodology. This means that it can be used to address practical problems, to focus on solutions to those problems and to explore issues from a variety of points of view. PLA is an iterative and organic process which encourages stakeholders to engage in cycles of research, co-analysis, reflection and evaluation together over time. This process enables stakeholders to achieve their goals for practice and/or policy. This process is often enabled by researcher/facilitators who encourage stakeholders to engage in a PLA 'brokered dialogue'.

Key stakeholder groups were encouraged to listen to, and learn from, each other's knowledge and perspectives. Stakeholders had time to consider which initiatives were particularly relevant to them and they were encouraged to choose one initiative to implement in their local setting. Trust, rapport and mutual respect are essential for a PLA dialogue and, when present, can lead to productive exchanges whereby all types of knowledge and expertise become explicit and valued. The aim was to allow knowledge and understanding to emerge from interactions between stakeholders as well as between practitioners and researchers. The participatory approach also allows integrating local and farmers' knowledge with scientific knowledge, thus fuelling reciprocal learning processes.

Comprehensively implementing all three characteristics in a single research project is a steep challenge, both conceptually and in practice. Doing so may not be feasible in many settings and often not effective. Scarce resources may make it more efficient to focus on those aspects that are most relevant to the specific situation in which the researcher is engaged. This led to the application of learning and action-based participatory approaches such as action learning, action research, participatory action research, and adaptive management. Many of these approaches are related to Soft Systems Methodology, which takes a set of actors through a process of shared problem appreciation, learning about the problem and taking collective action to improve it (Checkland and Poulter, 2006; Checkland and Poulter, 2010; Lieblein, *et al.*,2012). Whereas participatory elements are involved in many Farming Systems Research projects, the implication of a participatory approach has been especially developed by those researchers focusing on extension services. Their approach clearly shifted from doing research for farmers, to working with farmers. Appreciating the importance of integrating various knowledge systems, as well as the dynamic and evolving nature of situations, has led to emphasizing processes that can further 'social learning'.

Social learning is the systematic learning process among multiple actors who together define a purpose related to the agreed necessity of concerted action at a variety of scales. This process of social learning includes cultural transformation, institutional development and social change (Woodhill and Röling, 1998; Leeuwis and Pyburn, 2002). In social learning, farmers and other stakeholders become experts, instead of 'users' or 'adopters' of scientific recommendations (Röling and Wagemakers, 1998). In other words, ideally a participatory process produces knowledge of use to the stakeholders, and knowledge that researchers are able to position in their own professional world. Participation in collective action can actually rarely be reduced to maximizing personal utility, as it is often motivated by seeking benefits of the community, such as maintenance of traditions and cultural identity, or enhancing biodiversity through environmental management.

3.5 Sampling Design

The study used stratified random sampling technique to draw a sample from the youth development organizations population. This was because stratification allowed the investigation of the characteristics of interest for particular subgroups. Thus by stratification one was able to

guarantee representation of those who had benefited from training. The research study involved 143 respondents including heads of the youth organizations. Mugenda *et al*., (2003) argues that stratified sampling design is used on the basis of the researcher's judgment that the key respondents are relevant for the study. Polit, (1990) affirms that stratified sampling practice is used in qualitative study because of its flexibility in selecting information-rich cases.

3.6 Methods of data collection

Five methods were used to collect the required data. They included literature review, focus group discussions, personal interviews, key informant interviews and telephone interviews.

3.6.1Secondary data collection

Secondary Data from surveys and reports (county agricultural reports, were used in the study to verify/qualify some of the findings. Key among them was Strategy for Revitalization of Agriculture [SRA] 2005-2015, the Agricultural Sector Development Strategy [ASDS] 2010–2020 and the Agricultural policy document 2013/2014. Other studies on the participation of youth in organic agriculture and development in general were also reviewed.

3.6.2 Primary data collection

Key methods used for primary data collection included: Focus Group Discussions with youth group representatives, randomly selected from a list provided by the youth development centers. A total of 143 youths were interviewed. Personal Interviews: Targeting the randomly selected youth leaders involved in organic agriculture, a total of 20 personal interviews were conducted.

Key Informant Interviews: Those interviewed included County Gender and Social Services Development Officers, County Youth Officers, County Agricultural Officers. In addition, key contacts as provided such as Directors of Youth development organizations and trainers were also interviewed. A total of 24 Key informant interviews were conducted. The survey collected data from a total of 143 respondents the bulk of which was based on filled questionnaires from the youth [men and women] representing all the two counties.

3.6.2.1 Validity of the instruments

In order for the study to control quality, the researcher endeavored to attain validity co-efficient of at least 0.70 or 70%, validity refers to process of ascertaining the degree to which the test

measures and what it purports to be measuring. Validity was determined by giving to two experts to evaluate the relevance of each item in the instrument to the objectives and rate each item on the scale of very relevant (4) quite relevant (3) somewhat relevant (2) and not relevant (1). Validity was further determined using content validity index (C.V.I) CVI= items rated 3 or 4 by both judges divided by the total number of items in the questionnaire. This was symbolized as n¾ / N. This technique was selected because it is easy to establish the validity of the research instruments thus revising and adjusting them based on the responses obtained and recommendation from the experts. The instruments were piloted in Rift-valley area which was not included in the study sample and modified to improve their validity coefficients to at least 0.70 (Kathuri and Pals, 1993). Items with validity coefficients of at least 0.70 were accepted as valid and reliable in research.

3.6.2.2 Reliability of the instruments

Reliability refers to the consistency of a measure. A test is considered reliable if we get the same result repeatedly. To ensure quality assurance of data collected, research assistants were trained for two days prior to data collection. To test consistency in producing a reliable result (reliability), a test-retest method was used. A sample of one percent of the sample size was drawn from the study area (these subjects did not participate in the main research) as part of a pre-test. In order for the study to control quality, the researcher will endeavor to attain reliability co-efficient of at least 0.70 or 70%, Reliability refers to the consistency of a measure (Orodho, 2004).The instruments were piloted in Rift valley area which was included in the study sample and modified to improve their Reliability coefficients to at least 0.70. This was symbolized as n¾ / N. (Kathuri and Pals, 1993). Items with Reliability coefficients of at least 0.70 were accepted as valid and reliable in research.

3.7 Data Analysis

Statistical Package for Social Scientists (SPSS) version eighteen was useful in obtaining descriptive statistics, comparison of variables and running the multivariate model. The package was used to run the analysis and for regression. The Poisson regression model was useful in verification of the significance of the variables to adoption of organic agriculture interventions.

4.0 ECOLOGICAL AGRICULTURE IN KENYA

Organic Agriculture in Kenya (4,969 hectare) is on a much smaller scale in comparison to Uganda and Tanzania. Certified Organic agriculture in Kenya dates back to the early 1980s when the first pioneer organic training institutions were established, and a few horticultural companies started growing organic vegetables mainly for export. Initial efforts to promote organic agriculture in Kenya were made by rural development, NGOs, CBOs and faith-based organizations. In 2004, The Kenya Organic Agriculture Network (KOAN) was formed as an umbrella organization representing all organic organizations in the country (UNEP UNCTAD, 2010). Organic production in Kenya is mainly concentrated in the Central Province near Nairobi. In 2005, between 2,200 To 2,400 metric tons of organic produce worth over USD 4.6 million was produced and exported from Kenya. Over the years, exports have diversified beyond vegetables and fruits to include products such as essential oils, dried herbs and spices, as well as products for the cosmetic and pharmaceutical industries that are more often produced by smallholders. There is also a growing domestic market (UNEP UNCTAD, 2007).

In Kenya over 70 per cent of agricultural activities are undertaken by women, especially in the small-scale producer sector. Exporting companies have tended to hire more women labourers for fieldwork and more men for packaging and processing operations. On a small scale, women mainly undertake the production, sometimes primary processing, and the marketing of organic produce/products at the national level. Men usually take charge of larger scale cash crop production and sale to informal and organized markets at both local and national levels (KOAN). It is difficult to determine how many people are directly employed by organic agriculture, especially small-scale farmers, as the sector is extensive, largely informal and has been evolving over a long period of time (more than 20 years). Even information about the employment levels of large-scale producers, who export both certified and non-certified products, is difficult to establish. Information provided by KOPA member companies indicates that between 30 and 1,200 staff members are employed per company. Land units of small-scale producers range between 1 and 3 hectares on average, whereas for medium-scale producers land units range between 3 to 15 hectares. Large-scale producers may cultivate from 15 hectares of land for intensive production to 100,000 hectares for extensive production – mainly grazing. Most small-

scale farmers are faced with food insecurity and their main objective is to set food on the table every day. Informal indications show that compared to other families, organic producers are more food secure and are able to sell excess produce, enabling them to educate and clothe their children better than other farmers. The contribution of organic agriculture to GDP is also difficult to ascertain, as the export councils in the three countries make no distinction between organic exports and non-organic exports.

The Kenyan domestic organic market is expanding rapidly. Currently there are ten retail outlets in Nairobi and others scattered in the main towns in Kenya that are selling organic products. One supermarket chain, Nakumatt, has started recognizing organic products by placing organic fruits and vegetables on distinct stands within their fresh produce sections. There are also more than 50 herbal clinics scattered in the country which are also promoting healthy eating through organic diets. A survey of self-proclaimed organic retail outlets showed the absence of certified organic products as most labelling of products was informal. 'Certified organic' products are usually few and most of them come from outside of the country, mainly from Europe. National price premiums rarely exist due to the lack of perception of the value of organic and the lack of certification and labelling. Price premiums at the national level come mainly as a result of better quality and improved presentation of a product rather than its perceived organic status. However, growing concerns about health issues are creating a growing demand for organic products as they are thought to have a positive impact on health.

The literature review finds that research on the productivity and the profitability of organic production in Kenya is very limited. To establish organic agriculture as an important tool in sustainable food production, the factors determining organic yields need to be better understood, alongside assessments of the many social, environments and land economic benefits of organic farming systems in which this study tried to establish. This literature review indicates that, globally, organic yields tend to be lower than in intensive conventional production. However, for developing countries, and for Kenya in particular, there is not much proof that productivity of organic agriculture in terms of yields is lower than conventional. Conventional production in Kenya is not generally intensive. The limited literature available to date shows that in this context organic conversion projects in East Africa generally lead to higher yield levels for

participating farmers. The higher yields derive from improved farm management with enhanced attention for, water and crop management.

4.1 Policy development in Kenya

Agriculture is the mainstay of the Kenyan economy and a key livelihood pillar for the majority. It directly contributes 26 per cent to the annual GDP and another 25 per cent indirectly. The sector accounts for 65 per cent of Kenya's total exports and provides more than 70 per cent of informal employment in the rural areas. The sector comprises six subsectors, namely: Industrial crops, food crops, horticulture, livestock, fisheries and forestry. The growth of the national economy is highly correlated to growth and development of the agricultural sector. In the first two decades after independence, the agricultural sector, and in turn the national economy, recorded the most impressive growth in sub-Saharan Africa at average rates of 6 per cent per annum for agriculture and 7 per cent for the national economy suggesting that increased and deliberate investment in agriculture will translate into growth of the national economy. The organic sector has developed without any official government policy support. Past attempts by ABLH, KIOF and other interested parties to get the government to act have received a cold reception. Despite this, the sector has benefited indirectly from two main government policies. Firstly, the NGO Coordinating Act (1990) which recognizes the work of NGOs as co-workers in rural development and secondly, the economic liberalization policies of the late 1980s and early 1990s, which created an environment for free enterprise. Indirectly, these created a favourable environment for the development of the organic industry, and the sector has been able to exploit these policy opportunities. KOAN believes that the organic sector cannot develop its full potential without government support. Among the issues that require tacit government support are curriculum development, harmonization, validation of organic research findings by the government research authorities, and mainstreaming of organic agriculture into the conventional agricultural extension system. School-to-work transition: The school curricula have generally tended to alienate the youth from careers in agriculture, and as a result the negative effects of the youth study-to-work transition have been more extensive in the agricultural sector than in any other sector. Agriculture is considered to be an occupation of last resort.

5.0 ASSESSMENT OF ECOLOGICAL SYSTEMS IN KENYA

Agricultural sector is a complex industry consisting of a range of different production systems, scales of production and sub-sectors. A frequent misconception is that organic agriculture means turning back the clock to a primitive mode of farming. While organic agriculture does build on traditional knowledge and practices, what it offers is a modern, ecologically intensive farming system that can perform successfully without any synthetic fertilizers or pesticides. This is achieved through a combination of techniques including intercropping with nitrogen-fixing legumes (or with other crops that produce synergies), crops rotation, biological pest control, use of locally adapted seeds/breeds and the re-integration of animals on farms. In the process, the stability and resilience of the surrounding ecosystem is improved rather than depleted as may be the case when high levels of artificial inputs are used. An ecological balance that maximizes nutrient and energy cycling is established between soil, plants, animals – and humans. Organic agriculture can be described as "neo-traditional food system", as it uses scientific investigation to improve traditional farming practices anchored in multi cropping systems, natural food preservation, and storage and risk aversion strategies that have traditionally secured local food needs.

Organic agriculture includes both certified and non-certified food systems. Farming systems that actively follow organic agriculture principles are considered organic, even if the agro-ecosystem or the farm is not formally certified organic. It is however important to keep in mind that the non-use of external agriculture inputs does not in itself qualify a system as "organic", especially if this results in natural resource degradation (such as soil nutrient mining). Therefore, it is erroneous to assume that African traditional systems are all organic; only those which sustain ecosystem productive capacity can be considered organic. In terms of output, organic yields can be broadly comparable to conventional ones and can increase productivity as a result of transitioning from the low-input systems normally found in developing countries, and Africa in particular. This is achieved by capitalizing on existing resources such as labour and harnessing natural resources processes (e.g. soil fertility or pest-predator balance). Transition to organic management could have enormous implications for food security, where farmers could virtually

double their output without having to invest in expensive and environmentally unfriendly – synthetic inputs. Obviously, extension will be of fundamental importance to build agro-ecological knowledge. The fact that organic agriculture emphasizes multi-, rather than mono-cropping is also important in terms of food security, which can be jeopardized when farmers produce a single commodity and have no safety net to fall back on. In organic agriculture systems, purchased input costs tend to be 40 percent lower while less irrigation water is needed. Furthermore, organic agriculture could give smallholder farmers the chance to access lucrative commercial markets for organic produce, on condition of course that affordable certification procedures and trading partnerships are established.

According to a study carried out on behalf of the International Food Policy Research Institute (IFPRI), switching to organic agriculture in sub-Saharan Africa would likely increase food availability and decrease food import dependency, with negligible changes in prices and no changes in current malnutrition rates (Halberg, 2007). Of particular relevance to sub-Saharan Africa and tropical countries in general is that organic crops are grown from traditional, local seed varieties rather than from commercial, laboratory-bred ones. The former are much more resilient to environmental stresses (e.g. drought, floods) and local pests and diseases and would thus help mitigate the impact of global warming or inter-annual climate variability on the food supply of developing economies. Recent models of a hypothetical global food supply grown organically indicates that organic agriculture could produce enough food on a global per capita basis for the current world population: 2 640 and 4 380 kcal/person/day, depending on the model used (Badgley, *et al*., 2007; Halberg, *et al*.,2007). The lower value is based on the adult 2 650 kcal daily caloric requirement, while the higher value is based on expectations of a 57 percent increase in food availability, especially in developing countries, giving it the potential of supporting even a larger human population. These results considered the average organic yield ratio of different food categories with no further increase in the current agricultural land base. Also, the model was based on substituting synthetic fertilizers currently in use with nitrogen fixation of leguminous cover crops in temperate and tropical agro-ecosystems. These models suggest that organic agriculture has the potential to secure a global food supply, just as conventional agriculture today, but with reduced environmental impacts.

Rain-fed Agriculture: Kenya's agriculture is predominantly rain-fed. There are two cropping seasons except in the very high-altitude areas. The performance of rain-fed agriculture varies due to the diverse agro-climatic zones. In the humid, high altitude areas, productivity as well as predictability of a good crop is high. However, the population density in these areas has increased and land has-been subdivided into such small sizes that it is becoming uneconomical for farm enterprises. In the medium altitude and moderate-rainfall areas, arable rain-fed farming is moderately suitable. However, there is a relatively high risk of crop failure due to increased frequency of dry spells and an uneven rainfall distribution. Increasing productivity in these areas requires better selection of crops, adoption of improved technologies, and better crop husbandry.

A large proportion of the country, accounting for more than 80 per cent, is arid and semi-arid with an annual average rainfall of 400 mm. Droughts are frequent and crops fail in one out of every three seasons. Most of the area is rangeland suitable for ranching and pastoralism. Farm enterprises comprise mixed crops and livestock. While there is ample land, farmers tend to grow crops that are not suitable for this rainfall regime or for the soils. Generally, for rain-fed agriculture, there is sufficient rainfall in the highlands with limited land. In the arid and semi-arid areas, there is more land but low rainfall making engagement of youth in agriculture challenging in both the high and low rainfall areas.

Irrigated agriculture: Kenya is classified as one of the water-deficient countries in the world. Water resources are unevenly distributed in space and time. About 56 per cent of all the country's water resources are in the Lake Victoria basin. Even in the basins, with the exception of the highlands, water availability is scarce. Consequently, the country's irrigation-based farming is still limited. Irrigated agriculture in Kenya is carried out mainly in irrigation schemes and in large-scale irrigation of crops such as rice and coffee. Individual farmers have developed their own systems of irrigation especially for export crops such as coffee and horticulture. Large commercial farms account for 40 per cent of irrigated land, smallholder farmers 42 per cent, and Government-managed schemes 18 per cent. There is enormous potential to expand irrigated agriculture in the country especially for horticultural crops. This could be done by damming surplus water during the rainy seasons in both high rainfall and low rainfall areas and use it for year round intensive cultivation and irrigated agriculture in the two areas respectively.

6.0 SUMMARY CASE STUDIES

6.1 Case 1: Osiri educational and Career forum

Osiri Beach Education and Career Forum, directly sponsoring over 50 students in schools, is a registered CBO that seeks to rid the world of poverty, ignorance and despair by engaging the youth in agricultural activities. It is situated on Osiri Beach near Homa Bay town on Lake Victoria, Kenya. So far it runs a library for the fisher folk, a development and education funds for the poor, and organic agriculture initiatives. Situated six kilometers north-east of Homa Bay town, Osiri Beach Village is easily accessible by road along C19, the road that runs north-eastwards from Homa Bay town to Kendu Bay and joins the A1 Kisumu road at Katito township. The fostering of Osiri educational forum is a response to the need to help train organic agriculture focused youth farmer community groups to continue to build their capacity post-training, and to enable them to provide extension activities to other youths in their area, especially those who cannot afford to come for training. Osiri educational forum have an organic farming demonstration site where trained members conduct weekly courses for the farmers of their community on pertinent lessons of sustainable farm development learned at the centre. Initially this training is done with technical support from Osiri educational extension staff until the youths from the community become empowered to carry on agricultural activities independently. Osiri educational forum empowers youth farmers with knowledge and expertise to become change agents and also expose the youth farmer to a variety of knowledge from different development agents in the community.

The researcher on his way to Osiri Beach Education and Career Forum

6.2 Case 2: Manor House Agricultural Centre (MHAC)

Manor House Agricultural Centre (MHAC) offers training in organic farming methods, a low input farming technology offered to resource-poor, small-scale farmers who can hardly afford the alternative expensive conventional farming methods that rely upon external inputs. Graduates are equipped with both theory and practical skills that can easily be adapted to create self-employment and to design their own training programmes for farmers in an effort to improve community livelihoods and enable farmers to produce higher yields from their small parcels of land while eliminating conventional costs. Since founding in 1984, MHAC has provided training and certification in sustainable agriculture, organic farming methods, and ecological farm systems for small-scale farmers. The numerous demonstration garden units of the Crops Department are a vital component of MHAC's programs in Organic Farming methods training. The most important principle of organic farming methods of farming is learning to care for the soil, for the soil to nourish the crops so that the crops can nourish people. Returning to the soil what people take out leads to improved and sustainable soil fertility. MTCs organize farmer exchange visits among themselves for experience, sharing, and learning from each other to further improve their skills. They are encouraged to recognize their indigenous technical knowledge. They are also encouraged to develop internal income generation. This often involves connecting them to appropriate market outlets and/or packaging and value adding training to make their local products more competitive; and helping them explore markets for their organic produce. MTCs provide an ideal set-up for communities to discover and further their own local potential and an opportunity to create "cooperatives" that enable them to pool their resources and compete effectively in the market place.

Picture depicting Beans, tomatoes, maize, and other vegetables at Manor House Agricultural Centre

6.2.1 Socio-Cultural Characteristics of the target population

From the study it was evident that communities had been exposed to certain cultural practices that had affected the way farmers perceive ecological agriculture; e.g. "*Use of organic fertilizers destroy soils; Organic agriculture does not produce adequate yields".* As a result there had been very little effort previously to improve soil fertility through organic means despite a series of researches on soil fertility improvement. Homa Bay County as a case is 90% Luo, it is very rich in Luo culture and most farmers have to follow their culture "in order to succeed". These include farming practices, where culture has been tied to time of farming operations ("*a son cannot plow or plant before the father does even if the father is not ready")* births, rituals, deaths and other practice within the society are held with high regard. Consequences are attached to each of these norms (Mango, 2000).

6.2.2 Socio-economic Characteristics of the target population

The main source of income in Homa Bay and Trans Nzoia is agriculture with 51% compared to other non-agricultural sources at 41% and remittances at 8% (Kenya demographics Report, 2009). According to the livelihood data available at the County data base, nearly half of all female youths (47.4%) and their male counterparts (59.9%) are employed in the agriculture sector. However, agricultural production is mainly for subsistence and not much attention is given to production for income. Production for income has not been feasible considering the high cost of inputs, land size and best agricultural practices. Sales of small shop items and service provision in homes and business premises becomes the second source of livelihood (27%) while unskilled and casual labour to farms and homes takes the third position in the county.

6.2.3 Cultural Practices of the target population

Folklore is still part of the learning of all groups from family units to nations. In general, superstitious practices and beliefs are most common in situations involving a high degree of risk, chance, and uncertainty, and during times of personal or social stress or crisis, when events seem to be beyond human control. The question of what is or is not superstitious, however, is relative. One person's beliefs can be another's superstitions. All religious beliefs and practices may be considered superstition by unbelievers. Acceptance and perception of any form of agricultural practice will influence adoption or rejection. Most of the ideas and interventions go with the inventors (researchers) after a period. The decisions in most cultural setups were made by the

respondents heads in which case were men. The Luo community where Homa Bay County falls is one that is very rich in traditions. Some of their beliefs relate to crop production and they could deter or promote adoption process of any organic agriculture intervention.

6.3 Comparative Research

Comparative organic research can be of qualitative or quantitative nature and complex. Comparative organic research would ideally consider different types of farming with the same crop and cropping system and which are geographically close. In this case data was expressed in similar units (e.g. per hectare, m2), and corrected where necessary for issues such as planting density, mixed cropping and intercropping. The respondents considered were ideally from the same socio-economic group and position and had comparable access to resources. Data was disaggregated by sex in order to distinguish farming by gender. In all cases, however, the interpretation of data was crucial. In order to properly interpret data, a participatory approach was adopted in which the analysis established was fed back to the actors concerned, discussed and commented by them before definite conclusions were drawn for implementation.

Manor House Farm Land

7.0 CHALLENGES TO THE DEVELOPMENT OF ECOLOGICAL AGRICULTURE IN KENYA

These include at the technical level:

i. local adaptation of the principle features of organic systems
ii. determining nutrient sources for maintaining soil fertility
iii. particular pest and disease problems

On the social level:

i. problems with acceptance of the change in technology
ii. gender implications of organic systems e.g. in Kenya collecting manure and materials for composting tends to be women's work

At institutional level:

i. farmer capacity for enhanced management
ii. extension system capacity
iii. research capacity
iv. private sector management capacity
v. capacity to develop local certification scheme

At government level:

i. overall government policy towards the environment, society, farmers and trade in country legislation that is at odds with organic standards e.g. mandatory seed treatments
ii. export or import legislation at odds with organic standards e.g. fumigation
iii. internal transport and shipping infrastructure

8.0 FINDINGS AND DATA PRESENTATION

This chapter highlights the findings of the study carried out in Homa Bay and Trans Nzoia County from members of the youth agricultural training organizations. The study aimed at accessing the performance of youth development organizations implementing organic agriculture programmes and how this can be improved to enhance income generation for the youth. Both qualitative and quantitative statistics on demographic, socio-economic, production and socio-cultural were used to obtain the findings. The study findings were multi-variate where one farmer could respond to practicing more than one method of organic agriculture intervention at the same time.

8.1 Socio-Economic Profiles of Respondents

Of the total number of interviews conducted, there were more male respondents [54.8%] than women [45.2%]. In education, (32.7%) had completed secondary school while (17.6%) had completed primary. It was also found that (6.5%) had attained University level of education and only (3.4%) had no formal education. Regional comparison in education shows that Homa Bay had the highest number of those having University degrees accounting for (69.6%). In terms of tertiary/college level of education attainment, Trans Nzoia led with (20.4%). During the focused group discussion guide it emerged that respondents who had attained a higher level of education seemed keen on up-taking organic agriculture as compared to their counter parts.

8.1.1 Descriptive Analysis and Demographic Characteristics

The expected respondents in the study were 150 (109 males and 41 females) from Homa Bay and Trans Nzoia counties. However, during the responses rate analysis seven respondents were not available for the study thus reducing the number of respondents to 143 (104 males and 39 females).The study aimed at evaluating field experience of organic agriculture in Kenya while assessing whether the expected impact of such projects benefitted the youth through the learning system. Both qualitative and quantitative statistics on demographic, socio-economic and production were used to obtain the findings. The study findings were multi-variate where one farmer could respond to practicing more than one organic agriculture intervention method at once. Most of the cultural and traditional factors came up during focus group discussions as respondents were not readily willing to give information on some of the cultures and traditions.

However, traditions and taboos related to crop production came out clearly during focus group discussions. According to the focus group discussions, one of the major setbacks in the Luo tradition was that most of their activities were attached to some taboos; most common of them was *"chira'*.

8.1.2 Adoption of organic agriculture interventions by Age

The research established that the ages of the respondents range from 17 years (minimum) to 30 years (maximum), having a mean of 54, median of 55 and the majority (mode) fall at 25 years. From the regression analysis carried out, it shows that age is significant when considering the organic agriculture adoption and learning techniques. This was based on the Poisson regression analysis (student t-distribution) with a p value of <0.001. The study found that organic agriculture adoption and learning techniques concentrated among the ages of 22 years to 26 years. The study established that the younger age groups were more of adopters running through the organic agriculture interventions whereas the older groups seemed to adopt less of organic farming practices.

During the focused group discussion guide the older respondents stated that it was not profitable to engage in organic agriculture since their land was always flooded during the rainy season, they equally attributed the interference of hippo's and monkeys that preyed on their farm lands. Further, most respondents complained about the quantity of their organic yields as not being viable and encouraging for them to continue farming.

Picture of water flooded farm lands

8.1.3 Adoption of organic agriculture interventions by Level of education

A total of 10 (7%) of the 143 interviewed respondents attained tertiary education (post-secondary education). Most of the respondents attained Primary level of education 68 (48%); 33 (23%) attended secondary school, while 20 (14%) never went to school. The remaining 12 (8%) attained nursery level of education. Of those that had tertiary education an average of 70% adopted all the organic agriculture interventions. Adoption was significantly lower with decrease in education level. This was further confirmed by the Poisson regression analysis (student t-distribution) done to test the significance of education level to adoption of organic agriculture and the *p* value was < 0.001.

During the focused group discussion guide it emerged that the less educated respondents had a lower interest on adopting the organic agriculture interventions.

8.1.4 Adoption of organic agriculture interventions by Gender

The statistics showed that gender was evenly distributed across the adoption of organic agriculture and learning interventions. However, comparatively the number of males was higher than that of males. The findings show that out of the 143 respondents, there were 104 males as compared to 39 females. Out of the 104 males, 45 (41%) adopted maize production, 38 (35%) adopted crop diversification and 26 (24%) adopted soil fertility improvement techniques using organic manure. On the other hand, out of the 39 female respondents, 17 (42%) adopted maize production, 14 (34%) adopted crop diversification while 10 (24%) adopted soil fertility improvement techniques using organic manure.

Organic Agriculture Adoption seemed to be higher by men than women across all the interventions. Therefore, gender as factor is significant to adoption of organic agriculture. This was further tested using the Poisson regression analysis and the probability test, (*p*) value < 0.001 in relation to organic agriculture adoption and learning. Males (men) tended to avoid adoption of organic agriculture because of the lower productivity level as compared to other forms of non –organic agriculture, "*the production rate of non-organic agriculture is good and profitable in terms of quantity thus acting as a source of alternative employment"* (FGD results).

8.1.5 Adoption of organic agriculture by Level of income

The study found out that income plays a very vital role in adoption of any organic agriculture intervention. Income is dependent on both the level and source. Income level was gauged with how much the respondent earned in a month. A large percentage of the respondents earned a monthly income of less than Kshs. 2,500 while a minority of respondents earned more than Kshs. 10, 000/= and this income is mainly earned from Agriculture based sources. The higher income earner were mainly engaged on regular agricultural activities and according to a discussion during an FGD by men only, they stated that; *"the high income earners disposed their yields out in town thus obtaining large profits for their produce ".* This together with the findings during the interviews did not tally because it is indicative in the study that income is not significant. The result of Poisson regression (student t-distribution) analysis carried out on income level by adoption shows that income level is not significant to adoption of organic agricultural interventions *($p<0.001$).* From the comparison analysis done, it showed that the lower income respondents tend to adopt organic agricultural interventions better than the latter. According to an FGD conducted for men only it emerged that, "*the interventions cut across all levels of income without choosing on particular wealth category"*.

8.1.6 Land under organic farming

The study revealed that all the respondents interviewed had access to land for farming and the acreage varied from one respondent to another. Majority of the interviewed respondents had 0.5 acres piece of land with the least having 0.25 acres and highest 5 acres of land. The average land holding is 0.97 acres with a range of 4.75. When this was subjected to Poisson test, land size under crop production was found to be significant with a *p* value of <0.001. According to one of the focus group discussants*, "Despite having access to land most of the respondents interviewed don't use their land for organic agriculture due to their perception on the quantity of production"*.

Out of the total arable land in the counties, only 1,000 acres was under organic crop farming as compared to the available 3,000 acres (Ministries of Agriculture and Lands Reports, 2013 and 2014). This was verified further during the study which found out that land for cropping was varying between 800 acres in the short rains to 1000 acres in the long rains. The table below

(Table 8.1) shows how land was distributed among respondents in sizes. The average land holding by respondents is 0.97 acres while a majority of the respondents had 0.5 acres.

Table 8. 1: Land size/holdings Distribution within respondents

Mean	Median	Mode	Std. Deviation	Minimum	Maximum
0.97	**0.88**	**0.5**	**0.66**	**0.25**	**5**

Source: Primary Data

Organic agriculture Adoption was conspicuous among respondents with bigger land sizes. Respondents with 1.75 acres and above had adopted almost all the organic agriculture interventions. The general trend is that adoption is > 80% for respondents with bigger pieces of land. However, certain respondents have access to bigger portions of land (1.75 -3.0 acres) but have not adopted any of the organic agriculture interventions. According to all the three FGDs, "*Certain respondents with bigger portions of land had misconceptions of adopting organic agriculture since they were focused more on quantity for sale and consumption"*. Land size is not significant to adoption and this is confirmed by the regression analysis (student t-distribution) done giving a *p* value of *0.001*.

8.2 Production Factors of Organic agriculture intervention

8.2.1 Maize Yields

Maize yields were directly proportional to the amount of organic input used, other factors like the existence of striga weeds constant. The study found that maize yields a year prior to the project interventions (2010) during a baseline survey was at an average of around 4 bags (90Kg each) per respondent who practiced organic farming. One year down the line, there was a remarkable increase to an average of 9 bags per respondent. The trend continued to 2011 and in 2013 there was a drastic drop to 6.5 bags per respondent. However, in 2014 there was an upward trend to 7 bags. The year 2011-2012 saw the turn of events with introduction of organic agriculture intervention strategies (Report from ministry of Agriculture 2014).

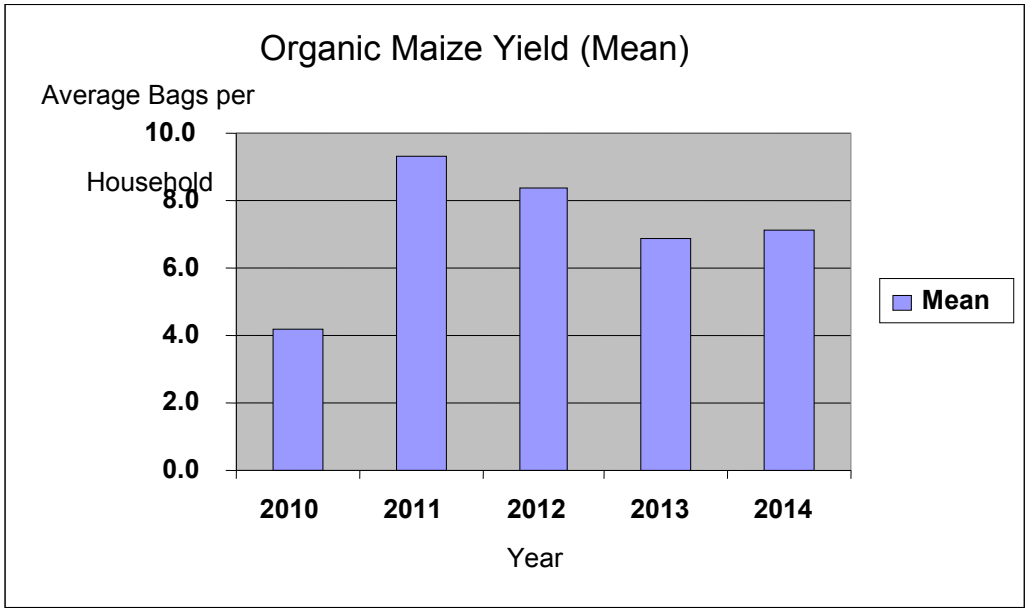


Figure 8. 1: Chart Showing Organic Maize Yield Trends over the Years

Picture of Organic maize farm

8.2.2 Crop diversification

Diversification comes in the wake of having security crops as alternatives to maize as a crop as well as a means of income generation to the respondents. Crops involved in diversification include; horticulture with a series of vegetables, Tissue culture bananas, chillis, groundnuts and

Soya beans. Following the trend of events, uptake of crop diversification has been slow but with an upward trend in the past four years.

Picture depicting crop diversification

8.2.3 Organic Agriculture Training and Skills

Two heads of youth agricultural training organizations were interviewed on the programmes they offer and their view on demand for agricultural programmes. The organizations interviewed were Osiri Beach Educational Forum and Manor House Agricultural Centre. In the two youth organizations it was found that organic agriculture and agribusiness courses were constrained by low demand for the course and or lack of instructors. In the Manor House Agricultural Centre, organic agriculture is offered as a common course to all as a way of encouraging interest among the youth. The courses offered in Manor House Agricultural Centre covers among others, tomato production, bee production, tissue culture banana and poultry keeping. In the Osiri Beach Education Forum, ecological agriculture was center stage though interference by hippos hindered total adoption of the same. However, students were involved in the institutional farm where they were taught organic agriculture methods.

Staff from the Farmers Training Centres (FTCs) a government owned programmes were also interviewed and they indicated that there is very high demand for their organic agricultural programmes. This implies that a traditional trend where agriculture training is held at the Farmers Training Centres (FTCs) is what majority of the people know. This is especially given in the context of the categorical statement by youth that they do not want long term agricultural

training courses. However, the team perceived that if there was a ready job market for agricultural graduates, the demand for agricultural courses could be too high for the available capacity.

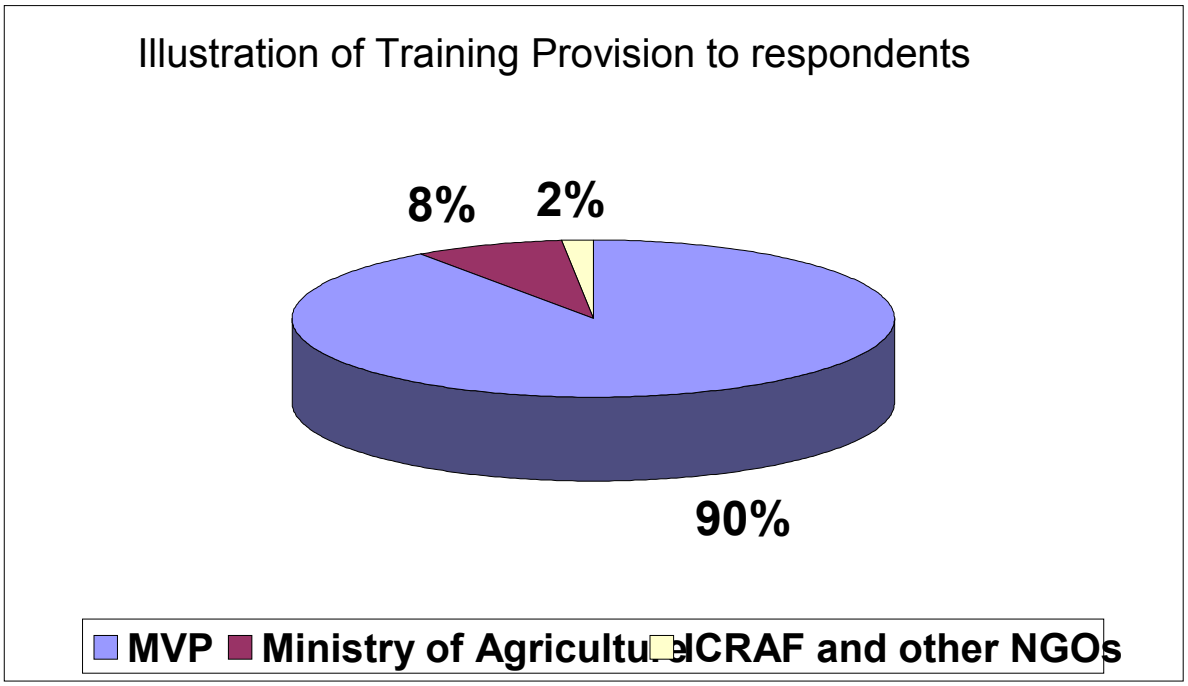


Figure 8. 2: Training Providers to Respondents during the project period

Training as a tool for acquiring information is quite significant in adoption of organic agriculture intervention. Trainings for organic agriculture interventions were mainly done by the ministry of Agriculture (8.2%) that could come on demand by the youth farmers or on special programs like the NALEP programs but focus was mainly on the Focal areas which would only be for a season. ICRAF because of a series of researches that they are carrying out in the area have in particular targeted youth groups; together with other organizations like Africa Now, FAO and CARE-Kenya have trained 40 of the interviewed respondents.

Of the 143 respondents 78 (56%) had heard and been trained on the entire organic agriculture intervention programme and were practicing through the four years; 42 (28%) had heard but discontinued and 23 (16%) never heard and therefore have not adopted any of the organic agriculture intervention programme. The reasons of non-adoption/discontinuation among those

not adopting were attributed to perceptions/beliefs of low production yields as compared to hybrid farming.

8.3 Organic Agriculture Adoption Trends

Majority of the youth consider agricultural work to be for 'those who have not gone to school'. Moreover, many youths who grew up in the villages have an experience of the long hours that go into traditional agriculture without a commensurate return. This sentiment was demonstrated during the focused group discussion where respondents stated that their peers mostly believed that their future lied with a different career that is financially more rewarding and can be found in the urban area. This made the researcher to opine that there was need to demonstrate the changing face of organic agriculture, the increasing demand for traditional commodities, new and emerging local and international markets, and the possibility to introduce management innovations in the sector.

Analyzing the trends of organic agriculture adoption through the four years of continuous interventions beginning from the year 2010 which acts as the baseline period prior to the project onset to 2014, there seemed to have been a sharp rise in organic agriculture adoption for specific interventions on crop production, particularly on maize production moving from 75 respondents in 2010 to a peak of 105 respondents in 2014 and on soil fertility improvement strategies up from 70 respondents in 2010 to 100 in 2014, particularly use of organic fertilizers, composting and improved fallows. However, diversification did not improve much. According to the findings from the focus group discussions, one respondent stated that ('*puro ma sani tek kabisa niketch koth be ochwe ahinya, maa ohinyo wa okwa nyal uso chiemo matin ma wa golo epuodho')* meaning today's farming is quite difficult because the rain is not reliable hence affecting production and sales of the same (FGD-Women only). However, there is a downward/negative shift on adoption in the years; 2012 to 2013 and this is illustrated in figure 8.3 below.

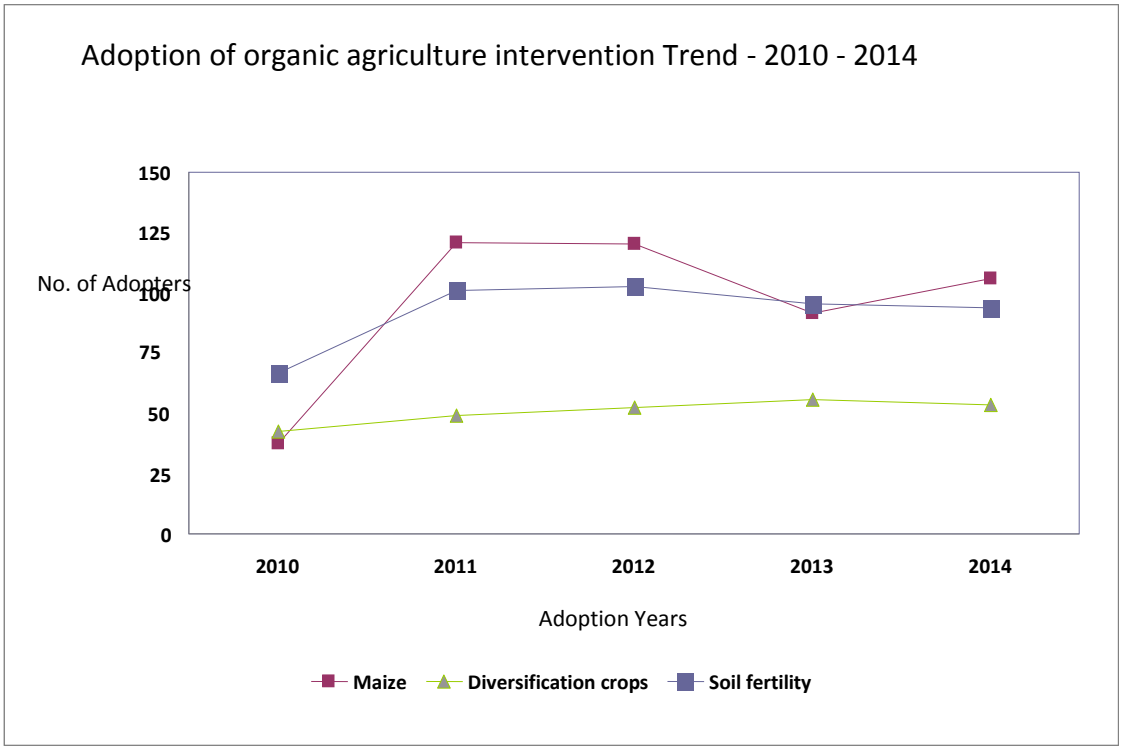


Figure 8. 3: Organic Agriculture Adoption Trends

9.0 DISCUSSION

This chapter highlights the summary of the level of organic agriculture adoption and a discussion on the learning process. Several efforts can be made towards improving livelihoods but unless areas surrounding productivity are considered, very little can be achieved. Looking at the intervention, a series of factors have contributed or hindered the impact of organic agriculture interventions in Kenya. The interventions recommend focused on organic maize production, organic soil fertilization and organic crop diversification. This would go further in improving livelihoods through increased income towards achievement of MDG number one.

9.1 Respondents Adoption Level

The level of adoption was measured as the numbers of respondents taking up the interventions and practicing them continuously and sustainably. The trends of adoption through the years indicated that with a boost/subsidy to any farming group, there will be a sudden increase in yields or performance. The trend in the study was indicative of sudden rise with intensified interventions and dissemination of the right information with regard to Organic Agriculture farming. The highest level of adoption was registered with maize as a method of intervention. Soil fertility improvement went hand in hand with maize production due to the fact that its major intention was to improve maize production among other crops. Low adoption of other interventions like crop diversification could have other challenges associated to them especially financially based ones. Despite the slow uptake, the study established an upward trend giving it the benefit of time. As time goes by, uptake may improve and if possible stabilize. Respondents/demographic characteristics which include respondents land size, respondent's level of education, age and gender are directly linked to adoption of any intervention. Larger land holders would adopt less or more of any intervention depending on their ages. Land both as a production factor and socio-economic factor did affect adoption of organic agriculture intervention. Smaller portions of land may not make it feasible to adopt certain food production practices. A higher number of respondents had very small pieces of land of 0.25-1.0 acres making them not go in for more intervention based farming thus the low adoption of some of the food production techniques. The smaller the landholding the less adoption is feasible.

9.2 Demographic Factors

Age of respondents members would determine adoption as the younger the respondents the more the adoption. The older respondents tend to adopt less. In a similar study, Asiabaka *et al.,* (2002) found that the older the farmer the less likely the adoption of any interventions because the younger farmers are more willing to take risks in farming than the older ones. Gender differences play an important role in adoption of organic farming. Access and ownership of resources is basically men oriented and in this study, men tend to dominate over land ownership denying women the right both to use and making decision. According to Morris and Doss (1999), adoption wholly depends on access to resources rather than gender. Therefore, the more one has access to resources the higher the chances of adopting any intervention.

9.3 Production Factors

Land size is a factor of production that greatly influenced the adoption of organic agriculture interventions. About 50% of the respondents own less than 1 acre of land and therefore are not able to produce enough for both sale and consumption. The same respondents were not able to be involved in other forms of interventions (on farm diversification) that are geared towards improvement of income to supplement food production thus affordability was limited. Some of the packages like dairy, banana production and chilli production are land demanding causing farmers to avoid going for these interventions. Soil fertility and the right seed are crucial to food crop production. Use of the right kind of organic fertilizer and at the right time ensures good production. For the two years that high maize production was realized (2012 and 2013), there was good use of organic manures together with good soil conservation measures in place. Inadequate organic fertilizer application reduces productivity of any crop, be it the maize crop or other diversification crops.

9.4 Socio- Economic Factors

From the regression analysis carried out, it emerged that income level is not significant in adoption of organic agriculture interventions; however, the FGDs indicated that income level affects adoption of organic agriculture as the higher income respondents adopted better most of the interventions. However, according to Karki and Bauer, (2004) level of income strongly influences adoption of any farming method. On the other hand, level of education had impacted so much on adoption as these interventions required skills and understanding for full uptake.

Lower education could not allow the farmer to pick up easily and translate the interventions into practice. This shows why adoption was higher with those that attained up to tertiary level of education as compared to lower levels of education. A study by Ryan and Gross, (1997) used a retrospective survey method to model the diffusion of corn in Iowa, sought to correlate innovativeness (the time of adoption) with a number of variables such as the adopter's age, education, farm size, income and access to diverse information sources. The study found out that the less educated the individual, the less chances of adoption of any technology and less access to information.

10.0 STRATEGIES TO STRENGTHEN ECOLOGICAL AGRICULTURE IN KENYA

Amongst the many initiatives in Kenya to develop organic farming, there are only a few that have focused their efforts on developing national markets. The following provides an indication of the main proposed strategies:

i. Training of NGO and CBO staff in order to change their training approach from food security and kitchen gardening approach to organic farming for the market place.
ii. Facilitating organic certification for the local market by a local certifying body (Encert through pre-certification assessment of producers and producer groups, information dissemination, professional advice on production, pest and disease control and market development.
iii. Providing market linkages for producers and producer groups with retail outlets.
iv. Mapping out the organic farming opportunities and presenting them to organic food marketers, retailers and the government.
v. Streamlining and strengthening the Kenya Organic Farmers Association (KOFA) as a body representing smallholder organic farmers in Kenya.
vi. Facilitating networking of all the producers, promoters, trainers, processors, marketers and retailers in order to streamline the organic sector and create linkages between all the players.

Such projects should be characterized by:

i. use of demonstration/model farms to combine the training of farmers and processors, with the education of consumers and research into appropriate production systems
ii. the harnessing of local expertise and knowledge;
iii. encouragement of linkages between NGOs, governments and educational/research institutes in order to foster greater mutual co-operation and support
iv. Facilitation of the transfer of appropriate information and know-how from experts to individuals and organisations in the country.

11. 0 CONCLUSIONS

This chapter summarizes the study and gives recommendations for Organic agriculture adoption, policy and future research. It also gives the summary of objectives and the methods used in the study.

11.1 Summary of the Thesis

The emphasis of the study was to evaluate field experience of organic agriculture in Kenya while assessing whether the expected impact of such projects was indeed seen, and under what circumstances do initiatives either achieve all or some of these, fail completely or continue to flourish. The impact of organic agriculture on the youth was the particular focus. If there was evidence that some or all of these benefits are observed as a result of the implementation of organic agriculture. All these factors that guided the study have been correlated to come up with the desired adoption model.

11.2 Production factors

Organic agriculture has been criticized for issues of productivity, price and feasibility, but it is generally applauded for its Sustainability impacts. Smaller pieces of land resulted in less adoption especially of crop diversification interventions. With bigger pieces of land, more than one intervention could be practiced within a given period of time. However, there is need to change attitudes and perception of respondents with regard to organic agriculture. Additionally, respondents with smaller farm sizes tend to become involved in other off-farm activities for income and food and neglect the farms at home. Organic agriculture enables farmers to improve their production systems and productivity without the need for significant financial outlay. The training of youth and smallholders and the creation of new local and export markets will both, and jointly, favor agricultural intensification and growth. Organic agriculture can increase agricultural productivity and can raise incomes with low cost, locally available technologies without causing environmental damage. All the case studies despite suffering numerous challenges have shown increase in per hectare productivity of food crops, which challenges the popular myth associated with organic agriculture. The study therefore concludes that there is need to transition into integrated organic agriculture.

11.3 Socio-Economic factors

The level of education was an important factor in adoption as it correlates with access to information and acquiring of skills. High levels of education together with capacity building through training enhance knowledge and practice. The study concludes that the systematic evaluation of the costs and benefits of different organic agriculture management options is critical to give farmers and decision-makers confidence in supporting the uptake of such practices. Focus should be on organic agriculture initiatives, which already appear to be providing farmers, households and communities with significant livelihoods, resilience and food security benefits. This should be done in the context of major national, regional and international policy processes and programs in order to increase relevance and traction. Organic agriculture methods are suited for the poor and marginalized farmers because it requires minimal or no external input thus the use of locally and naturally available materials to produce high quality products. Partnerships between farmers, farmer groups, NGOs and CSOs, organic movement organizations, governments and certifying bodies at all levels to foster successful organic agriculture is needed.

Figure 8.4 below is a model that is developed after the study and it shows how the factors are interrelated. One factor is not independent of the other. Therefore adoption is dependent on all the factors.

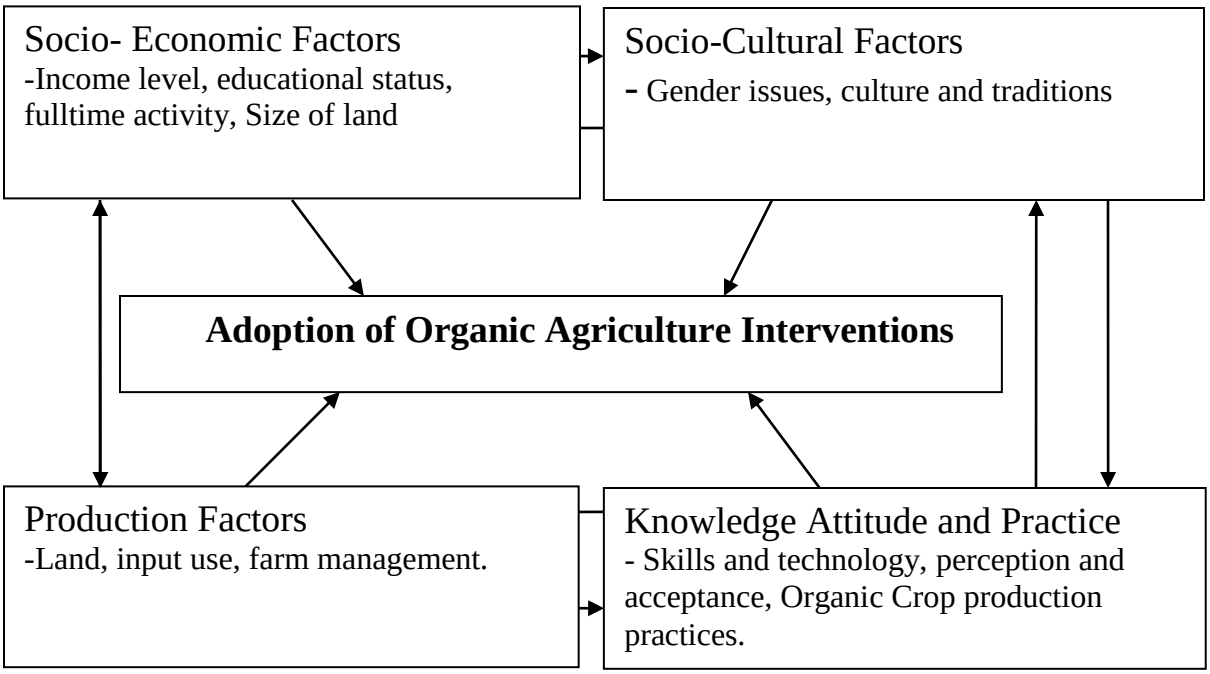


Figure 8.4: Summary of Adoption Model

The study therefore concludes that productivity in organic systems is management specific. The study established that switching to organic management commonly results in yield reduction in perennial crops (up to 50 percent) and during the conversion period for high external input systems in areas with favourable crop growth conditions (up to 40 percent). However, in regions with medium growth conditions and moderate use of synthetic inputs, organic productivity is comparable to conventional systems (92 percent) and in subsistence agricultural systems, organic agriculture results in increased yields up to 180 percent. Overall, the world average organic yields are calculated to be 132 percent more than current food production levels.

12.0 RECOMMENDATIONS

The recommendations in this study are made in three different areas. They are made to inform the government and policy on the possible areas to include in policy formulation and implementation. Another set of recommendations in this study is made for research for possible areas of further research and evaluation.

12.1 Policy

Owing to the success noted as a result of the interventions and the improvement of food situation in the study area, the Government through the Ministry of Agriculture should work towards making a policy to support organic agriculture. An organized system of capacity building for the youth and smallholder farmers to assist them in maintaining organic agriculture practice is also of great value for further spread and adoption of organic agriculture.

12.2 Youth Training Organizations

Thus, four approaches would seem appropriate in order to build up Youth development organizations as one of the platforms for re-branding agriculture and promoting entry of youth into agri-business and organic agriculture. One would be to develop a pilot scheme with a limited number of Youth Organizations where a package of incentives can be concentrated in order to encourage youth participation. Such incentives would include [a] ensuring availability of instructors [b] introducing and advertising innovative training packages in value addition, agricultural business management, market research, and use of ICTs etc. The second would be to create a network of supported Youth organizations that collaborate and compete amongst themselves to develop good practice/fields of excellence in youth and agricultural development and the third could be to promote formation of companies in production, processing and marketing organic agricultural produce that could employ the youth formally, paying them a regular salary just like any other formal jobs.

12.3 Area of Further Research

Due to changing trends in most of these factors, it is important to revisit the same study after some time. Such a study will also examine whether respondents would still be practicing the organic agriculture interventions and to what level. It is of importance to evaluate the whole

project interventions at the end of the stipulated project period and come up with areas that need further attention and where possible adjustments in the approach.

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APPENDIX

Appendix I : Questionnaire

IDENTIFICATION

Name_____

Village_____

Sub-location_____

County_____

Enumerator's name_____

Date of Interview_____

1.0 SOCIO- DEMOGRAPHIC VARIABLES:

1.1	HHID	
1.2	Age	
1.3	Marital Status	
1.4	Relationship to the head of household	1. Head 2. Spouse 3. Child 4. Other (Specify)
1.5	Household Head	1. Father 2. Mother 3. Child
1.6	Household type	1. Male headed

		2.Female headed 3. Child headed
1.7	Sex of respondent	1 = male 2 = Female
1.8	Family Size (By Number)	
1.9	Religion	1. ACK 2. Catholic 3. Pentecostal 4. SDA 5. African Instituted Churches (Legio Maria, Roho, Nomiya etc) 6. Other(sp)
1.10	Education (Highest level of completion in school –Class)	1. None 2. Primary 3. Secondary 4. Tertiary Colleges 5. University
1.11	Main Source of Income	1. Employed 2. Agriculture (Organic) 3. Subsistence with little surplus to sell 4. Small businesses (selling charcoal, paraffin, shop items, farm produce trade) 5. Remittance 6. Other (Specify)…….

2.0 PRODUCTION VARIABLES

2.1.1 Do you own land?

1. Yes 2. No

2.1.2. If yes, how much in acres?

(1). < 0.25 acres (2). 0.25 – 0.5 acres (3). 1 -2 acres

(4) > 2 acres

2.1.3. How did you acquire the land you are cropping?

1. Family land 2. Inherited 3. Bought 4. Hired

5. Other (specify)

2.1.4. Who holds the title deed to the land you are cropping?

1. Husband 2. Wife 3. Other (specify)

2.1.5. Who makes decisions on the use of land?

1. Husband 2. Wife (wives) 3. The whole family 4. Other (specify)

2.1.6 This section requires that you tell about the type of farming you have currently employed and level of production.

Enterprise	**Production**		
	Acres	**Number**	**Yields/Production (ref to code below)**
Maize			
Diversification Crops (3 major ones)			
a.			
b.			
c.			
d.			
Diversification Livestock			
Sheep			
Goats			
Cattle			
Bee Keeping			
Poultry			
Others (specify)			

1. bags
2. Kgs
3. number

2.2.0 Agricultural Inputs

2.2.1 The following questions are about your organic crops, the inputs you applied, how you obtained those inputs, and the quantity you harvested the year before, and all the long rain seasons since.

Input	Yes=Y No=N					How obtained? 1=Bought, 2=Assembled locally, 3= other, specify					Quantity applied (Kgs)									
	04	05	06	07	08	04	05	06	07	08	04	05	06	07	08	04	05	06	07	08
Kales																				
Beans																				
Maize Seed																				

2.2.2. If **Not** applying inputs currently (2014), why? (Code can be placed in above table)

1. Inputs too expensive.
2. Organic Fertilizers destroy soils.
3. I assembled and made my own organic manure.
4. Land too small
5. Credit not available

6. Inputs not available.

7. Other reason(specify)……
……
……
……

2.3.0 Training and Extension Knowledge

2.3.1 Have you been, trained, or implemented any of the following agricultural practices?

			Implemented						
Package	**Heard**	**Trained**	**04**	**05**	**06**	**07**	**Now (08)**	**If discontinued, why?**	**If never adopted, why?**
Line planting									
Organic Fertilizer application									
Soil Fertility Improvement									
a. Improved Fallows,									
b. Composting									
c. Soil conservation									

Fish farming									
Dairy production									
Bee Keeping									
Horticulture production									
-Onions									
-Tomatoes									
-Kales									
Cereal Banking									
Pre and Post-Harvest Grain Handling (Storage)									
Chilli Production									

2.4.0 Labor

2.4.1. What is your main source of labor on the farm?

1. Family

2. Hired casuals

3. Regular farm workers

4. Other specify……..

2.4.2. Is the labor adequate for the enterprises?

1. Yes. 2. No.

2.4.3 If no, why?

2.4.4 How much do you pay for labour in a day?

2.4.5 Have you been able to pay for this labour to cater for your farming needs?

2.4.6 What constrains you most in terms of labour use?

1. Availability

2. Affordability

3. Other (Specify)……..

a)……

b)…….

c)……..

d)…….

3.0 SOCIO CULTURAL VARIABLES:

3.1.1 Who takes the decision and works on the following food related issues?

Food Production Practice	**Decision**	**Who does the work?**
Land size for cropping		
Planting		
Weeding		
Harvesting		
Threshing		
Storage		
Surplus Sales		

3.1.2 Please explain any traditions attached to any of the following food production practices in your household. If there is, how does it contribute or hinder adoption of organic agriculture in your household?

Food production Practice	**Tradition**	**Contribution**	**Hindrance**
Land Ownership			
Land Preparation			
Planting			
Harvesting			

Storage			
Marketing			

3.1.3 Before you adopted organic agriculture in your farm, were there months of the year that you could go without food in your household?

1. Yes 2. No

3.1.4 If Yes, which particular months? (Tick as appropriate)

Month	**Jan**	**Feb.**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
No Food in Household												

3.1.5 After Adopting organic agriculture, are there months that you go without food?

1. Yes 2. No

Month	**Jan**	**Feb.**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
No Food in Household												

3.1.6 If yes, give reasons.

a.……

b. ……

c. …….

4.0 Youth and staff Training

1. What is the Nature of your appointment?

(1). ☐ Temporary Training Officer (2). ☐ Permanent Training Officer

(3) Any Other……

2. How many years have you worked at this institution? (Tick)

(i). ☐ 0-2, (ii) ☐ 3-5, (iii) ☐ 6-8 (iv) ☐ 9-11 (v) ☐ 12- and above

3. What are the existing training techniques and their effect on adoption of organic agriculture? (Tick)

i) Lectures ☐

ii) Coaching ☐

iii) Simulation ☐

iv) E-Learning ☐

4. What is the role of staff training?

a)……

5. What ways do workshop training affect adoption of new farming methods?

a)…….;

6. What ways does conferencing training affect new farming methods?

a)…….;

7 What ways do lectures as a method of training affect new farming methods?

a)…….;

8 a. Do you undertake staff training and is the intended objective achieved?

Yes ☐ No ☐

8 b. How often do you undertake training and is the intended objective achieved?

Once a year ☐ twice a year ☐ More than twice a year ☐

9. What are the challenges facing the training department in your performance (Name two)……

10. Provide possible recommendations on how to improve the training department.

a)……...

11. What strategies have been put in place in order to improve training techniques?

a)……..

Appendix I I: Questionnaire; FOCUSED GROUP DISCUSSION

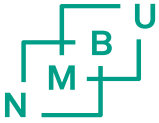
1. What is the field experience of organic agriculture in Kenya?
2. What is the expected impact of organic agriculture projects in Kenya?
3. Do organic agriculture initiatives achieve their intended objective?
4. What is the impact of organic agriculture on the youth?
5. How do youth benefit from organic agriculture initiatives?
6. What guiding principles need to be developed to assist the operators, advisors and potential donors and investors to increase the chance of success on organic agriculture initiatives?

Appendix III: RESPONSE RATE ANALYSIS

	Total	**Percentage**
Questionnaires distributed	150	100
Questionnaires returned answered	143	95
Questionnaires returned un-answered	7	5

Source: Authored 2014

During the research study the researcher distributed 150 which reflected 100% questionnaires, of which 143 (95%) were returned fully answered however 7 (5%) of the questionnaires were returned not fully answered thus not being able to be used for analysis in the research study.



Norwegian University
of Life Sciences

Postboks 5003
NO-1432 Ås, Norway
+47 67 23 00 00
www.nmbu.no