

## **Post-Secondary School Farmer Training and Its Influence on the Level of Performance in Farming in Kangundo and Matungulu Sub-Counties, Kenya**

**Stephen Kyalo Mutiso (PhD)**

*(Lecturer, School of Education, University of Nairobi, Kenya)*

---

**Abstract:** Farming is a major contributor to the economic development of Kenya. It is the source of livelihood for over 80 percent of the total population. However, a number of factors influence performance in farming. These factors are human factors, biotic factors, climatic factors and soil factors. The major sources of agriculture knowledge and skills are: the secondary schools, tertiary institutions, agricultural extension services and farmer training programmes. A number of secondary school agriculture graduates (SSAGs) take farming as a business. Their success in farming could be influenced by a number of factors, including post-secondary school farmer training. The target population consisted of farmers who studied agriculture at secondary school level and sat for the Kenya Certificate of Secondary Education examinations between 1989 and 2004. The sampling procedure adopted for the study was snowball method, where the sample size of 100 respondents was obtained. The study used an ex-post facto research design. Data were collected using structured questionnaires in Kangundo and Matungulu sub-counties. Descriptive statistics used for analysis of the objectives were means and percentages. Inferential statistics used for analysis of the hypotheses were categorical regression and Chi-square at statistical significance of 0.05 alpha level. Major findings of the study indicated that post-secondary school farmer training was not statistically significantly related to income from farming enterprises. The study therefore recommends that secondary school agriculture education should be backed with post-secondary school agriculture training at tertiary institutions.

**Key words:** Post-Secondary School, Farmer Training, Level of Performance

---

Date of Submission: 30-05-2019

Date of acceptance: 15-06-2019

---

### **I. INTRODUCTION**

#### **1.1 Background of the Study**

Kenya's economy is agriculturally based<sup>14</sup>. It is the livelihood of over 80 percent of the Kenyan populations who live in the rural areas and practice farming in small-scale holdings<sup>4</sup>. Despite enormous efforts to industrialize, Kenya has remained an agricultural nation since independence<sup>28</sup>. Farming serves as a source of food, raw materials for industries, employment, foreign exchange, market for industrial goods, capital for national development, and helps to correct the balance of trade deficit<sup>28</sup>.

Kenyan youth constitute 78.31 percent of the total population. The youth by definition refer to persons in the period between teenage and young adulthood (United Nations Education, Science and Cultural Organization<sup>41</sup>.<sup>43</sup> defines youth as comprising to persons falling within the age group of 13 – 15 years. The youth add up to about 29 million and comprise of 61 percent of unemployed Kenyans<sup>16</sup>. Given the high population growth in Kenya, the youth population is expected to double by 2045, further increasing pressure on job creation<sup>43</sup>. It is, therefore, expected that, most of the employment opportunities that will be created will be agriculture related and will target these youth<sup>42</sup>. The role of education in employment creation is very critical. It calls for a better focus by education systems on skills development, preparing youth for the transition to work, and for strong public-private partnerships. Modern agriculture and non-farm activities have considerable potential for job and wealth creation and may absorb large numbers of youth who currently crowd the urban towns and cities with underemployment<sup>43</sup>.

The main objective of the 8-4-4 system of education which was introduced in Kenya in 1985 is to prepare youth for self-reliance<sup>36</sup>. It means to transmit relevant attitudes, knowledge and skills needed in life after school<sup>36</sup>. This was as a result of the realization that, the previous (7-4-2-3) system of education did not respond adequately to the needs of the country people. Technical and vocational subjects previously taught only in a few technical schools were recommended for introduction in all other secondary schools<sup>24</sup>. This was to ensure secondary schools graduates have scientific and practical skills that can be utilized in self-employment,

salaried employment or further training. These technical/ vocational subjects are: agriculture, computer, music, commerce, art and design among others. The students are supposed to choose one of the subjects <sup>26</sup>.

Agriculture was identified as a major vehicle for transmitting farming skills to the youth <sup>28</sup>. It was hoped it would orientate them better to exploit their immediate environment for livelihoods. According to <sup>25</sup>, its general objectives were thus formulated as follows:

- i) To develop an understanding of agriculture, and its importance to the family and the nation;
- ii) to promote interest in agriculture as industry, and create awareness of the opportunities existing in agriculture and related sectors;
- iii) to demonstrate that farming is a dignified and profitable occupation;
- iv) to enhance skills needed in carrying out agricultural practices;
- v) to provide background for further studies in agriculture;
- vi) to develop self-reliance, resourcefulness, and problem-solving abilities in agriculture;
- vii) to develop occupational out-look in agriculture;
- viii) to enable schools to take an active part in national development through agricultural activities;
- ix) to create awareness of the role of agriculture in industrial and technological development;
- x) to enhance understanding of the role of technology and industrialization in agricultural development;
- xi) to promote agricultural activities which enhance environmental conservation; and
- xii) to promote consciousness of healthy promoting activities in agricultural production.

In order to achieve the stated objectives, especially the occupational ones (ii, iii, vi, vii, ix and x), agricultural skills and knowledge were recommended to be taught both theoretically in a formal classroom setting, and practically in a school farm/ laboratory by professionally qualified teachers <sup>26</sup>. The question is, have these occupational objectives aimed at creating self-employment among secondary school agriculture graduates been met?

## **1.2 Statement of the Problem**

The role of agriculture in Kenya's economic development is vital. There can be no economic growth without substantial growth in agricultural productivity. This underlies the reason why agricultural education was integrated in primary and secondary schools curricula, though as an optional subject. The motive was to create self-employment in farming among secondary school agriculture graduates, an occupation associated with the poor and uneducated people in Kenya. The problem is, it is now a quarter of a century since the advent of 8-4-4 system of education, which emphasized on self-reliance through self-employment. Yet despite this, few secondary school leavers with agriculture knowledge and skills are taking up farming irrespective of whether they are in any formal employment or not. Of major concern, the country continues to experience poverty, and dependence on donor countries for food and non-food agricultural commodities. The contribution of agriculture knowledge to the performance in farming by secondary school agriculture graduates has not been systematically investigated and documented.

## **1.3 Objective of the Study**

The study sought to investigate the influence of post-secondary school farmer training on the level of performance in farming among secondary school agriculture graduates in Kangundo and Matungulu sub-counties, Kenya.

## **II. LITERATURE REVIEW**

### **2.1 Youth and Unemployment in Africa**

<sup>43</sup> paints a gloomy picture on youth employment in Africa which warns that, the worst is yet to come unless policy interventions are urgently made. Youth aged between 15 and 24 and numbering about 200 million are increasingly finding it difficult to find jobs. Most fall off to grow the "reserve army" that is people who are actively looking for jobs but cannot find one. This transition to the labour market is marked by periods of unemployment or underemployment and is fraught with frustration. Currently, making up just over one-third of working-age population, unemployment in youth is so high they account for 60 percent of the "reserve army". Steadily, worsening over the years, youth joblessness and underemployment on the continent are assuming crisis proportions, particularly in the wake of the current global economic recession. Each year, 7-10 million youth enter the job market in Africa, often directly from school, yet only about 10 percent find wage employment, mostly in farming, which provides over 65 percent of total employment. To address the problem of youth unemployment, countries have to make progress on many dimensions. In the medium to long-term, the solution lies in rapid and labour-absorbing growth <sup>43</sup>.

In Kenya, the 2006 World population data sheet shows that population will grow by 87 percent to 67 million by 2050, from about 38.4 million currently, half of them aged below 24 <sup>16</sup>. This will further pull youth unemployment to crisis proportions. To address this crisis, the Government of Kenya launched the Kshs. 15

billion Kazi kwa Vijana (Jobs for Youth) initiative in march, 2009, which was expected to create 300,000 jobs in six months. However, more needs to be done in terms of creating a more conducive environment for the private sector to invest in labour intensive business. This calls into play all the macro, micro, and regulatory measures that attract investment, particularly from the private sector, and promote growth, including farming and the rural areas<sup>43</sup>.

## **2.2 Agriculture and Community Development**

Schools play a significant role in terms of socio-economic empowerment of the community. It is a tool for advancement of economic strategies in communities. It's also the general enlightenment of the masses<sup>7</sup>. Schooling, therefore, should induce into the youth the knowledge, skills and attitudes appropriate to their contributions in society. There should be relevance between the schools' curricula and the changing economic and social contexts of the community. What learners are taught in schools should endeavour to change in accordance to the emerging issues in order to serve the contemporary society (United Nations Education Science and Cultural Organization<sup>41</sup>). The influence of schooling is greatest when it is promoting knowledge, skills and attitudes which the community actively accepts and internalises. In rural areas, schools create aspirations in people for a better standard of living and better quality of life. There is value addition when learners participate in the economic activities of their communities after schooling. This reinforces and exemplifies the skills learned at school. Positive community-school linkage provides an opportunity for skill transfer towards community development<sup>34</sup>.

Community-school linkage becomes part of an outreach program for schools where they contribute actively to the efforts of those in community and provide basic skills. The school farm is the agriculture laboratory for the neighbouring communities<sup>17</sup>. Schools-community linkage can also be an in-reach program whereby schools open their doors and allow communities to come and learn certain skills<sup>34</sup>. Schools have been efficient at imparting literacy, innumeracy and basic pre-vocational orientation. Communities have a high desire for these skills when they are relevant to their socio-economic context<sup>7</sup>. One of the global aims of education is solving continuing problems that plague humanity such as unemployment and hunger. Schools are meant to prepare its graduates for productive work in the community. If youth are oriented positively to life in community, rural life will be enhanced<sup>41</sup>. According to<sup>7</sup>, the concept of community school should serve the whole community, which is its physical part and encourage the community in efforts which are beneficial to the wider social and economic needs of the society. Schools seem to be most effective as agents in socio-economic development when the social and economic change from back-drop and support community development processes, educational success and best practices including programs that have demand-driven designs<sup>34</sup>.

In the developing countries, governments have made efforts to adopt the schools to the local needs. Schools have been named community schools with an aim of preparing the learners for more productive or effective life in the local community. Currently, the school is perceived as directly functional to personal needs, therefore virtually all communities have become clients of schools. The communities have ambitions for their children to reap the occupational and material benefits of learning<sup>7</sup>. Throughout the 19<sup>th</sup> and 20<sup>th</sup> centuries, schools have been efficient at producing wage-earners and socializing children into habits appropriate to work in the modern industry. However, there is need for schools to develop the capacity to address emerging community needs and problems<sup>34</sup>.

Education in any society strives to achieve targetable goals. According to the Ministry of Education, science and Technology (MOEST) and the UNESCO, the goals of education in Kenya are:

- i) To serve the needs of national development;
- ii) To foster and promote national unity;
- iii) To prepare and equip the youth to play a leading role in the life of a nation;
- iv) To assist in promotion of social equality, train in social obligation and responsibility;
- v) To foster and develop our rich and varied cultures; and
- vi) To foster and promote international consciousness and unity.

## **2.3 Genesis and Growth of Agriculture Education in Kenyan Schools**

The agricultural sector is projected to grow at about 4-6 percent per annum if it has to contribute to national growth, and increase rural wealth<sup>18</sup>. With 80 percent of the population and the majority of the poor found in the rural areas, and relying upon small-holder farming at subsistence levels. It is evident that poverty reduction calls for higher agricultural growth rates. Agricultural growth can catalyze growth in other sectors, with an estimated growth multiplier of 1.64, compared to 1.23 in non-agricultural commodities<sup>19</sup>.

To achieve the projected growth rate in agriculture sector, however, the most precious resource would be the people regardless of their gender, age, and geographic location, and secondly their potential to work for the collective betterment of Kenya<sup>18</sup>. Human resource development through education translates to creation of labour and employment. This in turn trigger the improvement in provision of knowledge, skills and attitudes for

the work-force, stimulation of economic growth, maximization in utilization of labour, and human resources in income generating opportunities. This underlies the reason why agricultural education is given prominence in this study for its role in creation of human resource.

Agricultural education in Kenyan Secondary Schools bears its origin from Chavakali secondary school in western Kenya, where it was initiated by Robert Maxwell<sup>31</sup>. The programme had three basic objectives:

- i) Making rural secondary education more practical and more responsive to developmental needs of Kenya;
- ii) developing the school as a demonstration area, and generate enthusiasm and willingness to work among the students; and
- iii) relating agricultural subject to: the entire school programme, development of the region and country and life and future of the students<sup>31</sup>.

These objectives were consistent with the name of the subject at that time that is vocational agriculture. It was seen as a subject that would result in a reasonable amount of technical training among students. The subject aimed at making a student fit for effective employment in agriculture<sup>32</sup>. At the early stages, the pilot project met with apathy because members of the community viewed agriculture as an occupation for those who lacked school education<sup>22</sup>. This view was also directed towards those who were unable to make it through education system or other basic science subjects and hence agriculture was seen as a dirty job<sup>39</sup>.

Agriculture subject became officially established in the school curriculum at several phases in the slow development of colonial education<sup>38</sup>. The Ominde Commission<sup>8</sup> observed that, very little had been done towards training students in practical skills. The Commission emphasized the need to prepare secondary school students to take an active role in farming processes, besides preparing them for further studies in agriculture. A number of national development plans prepared after 1964<sup>9, 10, 11, 13</sup> took the Commission's observations seriously and made provisions for expansion of agricultural education to have more secondary schools teaching agriculture. Subsequent reports<sup>12</sup> and studies<sup>32, 38, 37, 38, 20, 21, 22</sup> have consistently shown that there is a lot of potential for making the subject more pragmatic and useful to national development.

<sup>43</sup> described various ways in which farming activities in rural areas can be purposely accelerated to enhance economic development. One of the ways was provision of agricultural education and training through schools, colleges, and extension education, including youth clubs. According to<sup>43</sup>, "without education, development will not occur. Only an educated person can command the skills necessary for sustainable economic growth."

#### **2.4 Practical Agriculture and Self- Reliance in Farming**

<sup>12</sup> advised the Government of Kenya that, the methods suited to the needs of the rural small-scale farmers be incorporated in to agricultural education programme to enhance self-reliance skills to would-be SSAGs. He further suggested that, the school teaching facilities should include small crops, and livestock enterprises to assist the learners gain the practical skills, geared towards self-employment and sustainability. Later on, <sup>12</sup> also suggested that, the curriculum for both primary and secondary schools should endeavour to prepare students for agriculture budgeting, the family welfare, and community development. It, in addition, suggested that, the teaching of agricultural science, including the economics of production be incorporated in the syllabus. The same report recommended that secondary education be geared towards the rural and informal sector by diversifying the curriculum and giving priority to teaching agricultural science<sup>12</sup>. There was further emphasis on practical agriculture for self-reliance and sustainability in farming. It is from the above reports that the general objectives of teaching agriculture were developed. Although agriculture was taught before 1976, it was more elaborate than it is currently.

The teaching of skills necessary for self-employment and self-reliance is only possible where there are adequate and proper materials and human resources<sup>25</sup>. The resources include school farms and competent and trained agriculture teachers. The teaching of agriculture has improved over the years to reflect the practical orientated approach. Among the steps undertaken by the Kenya Government<sup>25</sup> through Ministry of Education (MOE) include, ensuring that every school offering agriculture as an elective subject either owns or hires a farm for practical purposes. And should include the project work (Agriculture Practical Paper 3) as stipulated in the Kenya National Examination Council (KNEC) in 1985. Where students should fully participate in developing their psychomotor skills, hence become self-reliant and better farmers after completing their formal education<sup>25</sup>.

The Kenyan secondary schools agriculture syllabus was developed with a view to accomplish two fundamental objectives, the development of the basic principals of agriculture production relevant to Kenya in general and specifically to learner's environment. The second major objective is involvement of the learners in practical's aimed at making them to acquire the necessary skills useful in agricultural practices in all types of environments. The syllabus recommends that the teacher and the learners should select study crops and livestock that are most suited to the student's geographical areas for study<sup>15</sup>.

Other objectives are:

- i) Reinforcement of interest and awareness of opportunities existing in agriculture;

- ii) demonstration that farming is a dignified and profitable occupation;
- iii) expansion of knowledge of basic principles and practices of agriculture;
- iv) development of an understanding of the value of agriculture to the family;
- v) provide a background for further studies in agriculture;
- vi) develop self-reliance, resourcefulness, problem-solving abilities and occupation outlook among learners; and
- vii) ensure that learners take an active part in rural development by integrating agriculture activities in the curriculum <sup>15</sup>.

### **2.5 The Role of Small-Scale Farms in Income Generation via Improved Technologies**

The goal to raise Gross Domestic Product (GDP) growth to 5 percent per annum by 2011, and thereafter, to a sustainable level of 6-7 percent per annum would be unrealistic without significant contribution from agriculture sector <sup>18</sup>. Rural farmers in all circumstances are ill-placed to take advantage of economic growth, unless deliberate interventions are put in place to increase their potential and access resources, skills, technologies, and services necessary for them to rise out of poverty trap <sup>19</sup>.

<sup>29</sup> found that the role of crop science in poverty alleviation kick starts in the reduction of mass poverty in rural areas by accelerated growth of staple food crops out-put on family farms. Whether this is feasible and sufficient depends on national political and economic incentives and research institutions to create and apply appropriate crop science, land, and water access as well as open markets in the merit of goods. Progress is made possible by new technologies and by a crucial demographic shift-though many a times is handicapped by rich-world policies towards agriculture, trade, and technology.

Family farms have advantages that enable them to dominate, such as:

- i) Lower labour related transaction costs, and more family workers per hectare, each motivated to work and find, screen and supervise hired workers; and
- ii) low capital per unskilled worker and scarce land per person, as compared to large farms in developed countries.

Despite differing farm sizes and techniques, family management dominates farming at all levels of development. Data strongly points out that, such farms retain competitive advantages despite market distortions and despite some genuine and growing market handicaps as agricultural supply chains globalize and concentrate. The evolution of the family farms is thus linked to economic development. Almost all the family farms are now commercial and profit-seeking enterprises.

This success is, however, not without challenges, for instance, farm land is getting scarcer due to competing range of demands from other sectors like, human habitation, education, communication and health. This requires a technology-based agricultural revolution to counter the effect. The lesson for future crop science is clear. When choosing among research paths, a high employment share in extra science-induced farm income should hence be seen as a gain. According to <sup>29</sup> progress based on technology-agriculture for small family farms does not initially need good roads, credits, agriculture extension services and so on, helpful though they are, but the following are almost always essential:

- i) Total Factor Productivity (TFP) growth on farms via locally profitable employment-intensive technology;
- ii) land and water that are neither very unequally distributed nor unsustainably used; and
- iii) farm production patterns that are not too vulnerable to disabling of incentives by domestic or overseas policies that sharply erode or distort farm prices.

Technologies in farm production are increasingly needed to satisfy the food and income demand. With increase in population and decline in farm land, poverty alleviation requires TFP increasing technical progress to be faster, more yield-enhancing, and employment intensive. To achieve this, farm-based innovations are necessary to complement formal off-farm technologies. Another challenge on family farms is the law of diminishing returns that characterizes farm production. Research based on Mendelian break-through has increasingly focused on maintaining yields rather than raising them. Radical scientific and institutional innovations require private companies to seek public-purpose outcomes in terms of profits, mainly through contracts to achieve specific outcomes in raising family-farm productivity or robustness in neglected areas and crops.

Lastly, land and water sustainability has been threatened by crop expansion in to marginal lands. Some aspects of intensification have raised serious environmental concerns. Loss of biodiversity, inappropriate or excessive pesticide use, water and plant nutrient depletion, salinity and water logging, as well as nitrate and nitrite build-up in drinking water imperfectly separated from excess nitrogen fertilization and ill-drained farm water. These environmental concerns, while not obviating the need for yield-increasing intensification through innovation in farming technology, may narrow the acceptable expected means to that end <sup>29</sup>.

## **2.6 Agricultural Diversification for Increased Income and Food Security**

Agricultural diversification is defined broadly as the increased variety of agricultural commodities produced<sup>5</sup>. The livelihood of many farmers critically depends on incomes from diverse sources including the production of commercial crops and livestock products. Agricultural diversification represents a powerful counteractive force against population pressure that otherwise results in increasing poverty and inequality in many developing countries. Consequently, food security can be defined as the ability of countries, regions or individuals to meet their year round target calorie food requirements through domestic production, storage, and international trade<sup>6, 35</sup> on the other hand, defines food security as the access to enough food by people for active and healthy living. It is achieved when households especially those with smaller land holdings in Arid and Semi Arid Lands (ASALs), and weaker resource base are more vulnerable to food stress than wealthier households. Such households begin to suffer earlier than the rest, when food shortage occur<sup>27</sup>. Poverty is a major cause of inability of many individuals to acquire calorie adequate diet throughout the year. To be food secure, one needs a level of education that can enable him or her to be innovative and hence plant more, store more, or purchase food for utilization<sup>6</sup>.

A well chosen crop and livestock can mean the difference between survival and starvation. A survival crop is one that provides food in times of need. It is characterized by one or more of the following traits: It provides food even when it is not tended regularly, it can be stored for a long time, it has different parts that can be harvested, and, it survives when other crops fail. Examples for such crops include cow peas, cassava, arrow roots, pumpkins, potatoes among others. Diversification in crop and livestock is not likely to be successful unless it is based on major technological advancements in farm production. Significant progress cannot be expected unless it is supported by technological innovations. These innovations require a higher level of education among farmers for better adoption of new technologies of production<sup>5</sup>.

## **2.7 Theoretical Framework of the Study**

The study was guided by<sup>3</sup> theory, on “Sustainable livelihoods”. This theory describes the sustainable livelihoods framework as a tool that can define the scope and provide the analytical basis for livelihoods analysis, by identifying the main factors affecting livelihoods and the relationships between them.<sup>3</sup> outlines factors like, poor access to: (1) finances, (2) natural, (3) human/social resources, and, (4) the livelihood opportunities, and the way they interact at micro, intermediate, and macro levels, gradually shifting to livelihoods<sup>3</sup>. A key feature of sustainable livelihoods framework is its recognition of people as the actors, with knowledge and skills as assets that are capable of rational action in pursuit of their own livelihood goals. The framework also recommends for the initial emphasis on resource management to shift gradually to livelihoods after knowledge and skills (assets) acquired at school are fully utilized<sup>40</sup>. In this study, livelihoods related to performance in farming, whereas<sup>3</sup> factors for livelihoods related to the selected factors investigated in the study.

# **III. RESEARCH METHODOLOGY**

## **3.1 Research Design**

The research design chosen for the study was ex-post facto research design. In ex-post facto design, changes in independent variables have already taken place, and are studied in retrospect for their possible effects on an observed dependent variable<sup>1</sup>. The major weakness of the design is control, since randomization and manipulation of the independent variables are impossible. The research design chosen allowed the researcher to apply aspects of survey research to track the specified target population in Kangundo and Matungulu sub-counties. The researcher systematically examined the influence of independent variables (selected factors) on dependent variable (performance in farming).

## **3.2 Location of the Study**

The study was undertaken in Kangundo and Matungulu sub-counties, Machakos County. The area was chosen for the study due to its ecological conditions that make farming a predominant economic activity. The Sub County is carved from the former larger Machakos County, and has two main divisions, that is Kangundo and Matungulu. In the entire sub-county, farmers with desired characteristics were identified through snow ball sampling method. Kangundo and Matungulu sub-counties, has an approximate population of 258,895<sup>12</sup>. The rainfall in the Sub Counties is about 1500mm per annum, and the temperature ranges between 24°C to 28°C. The altitude range is 1500m to 2100m above sea level (ASL). The soil types also vary from vestisols/ferrosols to planasols<sup>30</sup>.

The above attributes favour farming activities. The Sub Counties have coffee and sisal plantations at Muka Mukuu, Kwamatingi, and Kyanzavi on the slopes of Kyanzavi Mountain and beef cattle ranches at Kamulu and Komarock plains of the Sub Counties. Apart from these plantations and ranches which today are owned and managed by farmer cooperative societies, the rest of the Sub Counties are highly fragmented into small scale holdings, ranging from 1 to 10 acres<sup>30</sup>. The main agricultural enterprises carried out in the Sub

Counties include coffee, maize, beans, pigeon peas, vegetables, fruits crops, root crops, dairy cattle, beef cattle, sheep, goats, poultry, and to a less extent bees. Due to this wide diversity in terms of crops and livestock enterprises, this study regrouped the enterprises into the following categories for ease of the study; coffee, cereals (maize/beans/pigeon peas), horticultural (vegetables/root/fruit) crops, dairy cattle, beef cattle/sheep/goats, and lastly, poultry production.

### 3.3 Target Population

The target population considered were secondary school agriculture graduates who studied agriculture as an examinable subject and sat for KCSE examinations between 1989 & 2004. The SSAGs were in addition small-scale farmers residing within their farms in Kangundo and Matungulu sub-counties, and practising farming for their livelihoods. A snow ball sampling method of selection was used to draw a sample of 103 respondents as per the recommendations of <sup>23</sup>; <sup>2</sup> on the range of subjects befitting representation for various categories of target populations.

### 3.4 Sampling Procedure and Sample Size

The targeted population was scattered over vast areas of the Sub Counties. Therefore, to access them, the researcher used a snow ball sampling technique <sup>33</sup>. A snow ball sampling technique recommends 100 respondents as the minimum number for ex-post facto and survey studies. According to the <sup>12</sup>, Kangundo District had a population of 258,895 by the year 2009. Out of this population, Kangundo division had a population of 123,692, while Matungulu division had 135,203. But the study sampled out 103 farmers from the two divisions to ensure the main characteristics of the respondents were captured. The sample size was large enough to allow a reasonably accurate interpretation of the results.

First, the researcher started by identified himself with the voter registration clerks in the various registration stations in the two divisions then, contracted by the Interim Independent Electoral Commission (IIEC) between March and July, 2010. When the eligible persons sought for voter-registration exercise in preparation for a Constitutional Referendum, the researcher identified those befitting the study. He cautiously approached and explained to them about the intended study and its targeted farmers. Once an eligible respondent was identified he/she had their identification names listed in a note pad and the cell phone contact numbers also noted down. They were then requested to give other tenable farmers with similar qualities for inclusion in the study, whose appointments to meet and be briefed about the study would be done. By August, total of 68 males and 35 females were identified as accessible respondents from the two Sub Counties.

Secondly, appointments with the farmers to visit their farms were made via the cell phone between the months of September and October. Each individual farmer was visited once and a questionnaire was issued where after a detailed explanation on what information to fill in the questionnaire was communicated during the visit. The sampled farms across the Sub Counties were all small scale (between  $1 \leq 10$  acres). Out of the 103 farmers visited and interviewed, only a 100 were used in the study based on their level of enterprise diversification, and total annual income realized from farming (Table 1). Questionnaires from three farmers failed the test for inclusion into the study for lack of enough information in terms of enterprise diversification and data on incomes obtained for the three consecutive years (2007-2009).

**Table 1: Distribution of Respondents per Sub-County and Location**

Sub Counties	Location	Frequency	Percentage
<b>Kangundo</b>	Kanzalu	10	10.0
	Kivaani	8	8.0
	Kawethei	9	9.0
	Kangundo	14	14.0
	Kakuyuni	9	9.0
<b>Matungulu</b>	Tala	9	9.0
	Kyanzavi	8	8.0
	Kyeleni	7	7.0
	Komarock	3	3.0
	Nguluni	5	5.0
	Kalandini	7	7.0
	Matungulu	11	11.0
<b>Total</b>		<b>100</b>	<b>100</b>

### 3.5 Instrumentation

Data was collected using a questionnaire developed by the researcher. The questionnaire was used in the study to collect data for the following variables of the study: perception towards farming, post-secondary

school farming experience, gender, and farmer training seminars. The questionnaire particularly sought data on whether the farmers utilized the farming skills taught at secondary school agriculture syllabus in their farming activities among others and whether they were meeting their projected outputs in terms of income returns from farming enterprises of their choices. A questionnaire in this study was used for its efficiency, economical in utility and practicality besides allowing for the use of a larger sample. Standard instructions were given to all the respondents; in addition, the researcher explained the questionnaire items that were not clear to the respondents as recommended by <sup>1</sup>. The instrument was designed to capture data from farmers in all aspects mentioned and therefore, meet research objectives. To control the effects of history and maturation, the data were collected at one point in time. To moderate the effects of education, the study only used respondents who had attained secondary school agriculture education. Finally confidentiality was ensured between the researcher and the respondents.

### **3.6 Data Collection Procedure**

Since Kangundo and Matungulu Sub Counties covers a vast area with the longest distance through the centre being 42Km (North-South), and shortest distance 32 Km (East-West), the researcher used a motor bike to travel across the two sub-counties meeting the respondents at their respective farms. Each day the researcher visited at least 5 to 8 farmers on their farms on the basis of their proximity to each other taking caution to maintain confidentiality of the visits and the information gathered from the respondents. Each farmer was visited once, and a questionnaire was administered during the visit to collect the required data.

### **3.7 Data Analysis**

Once the data collection exercise was completed and raw data were obtained. The researcher organised the data by first coding it before finally key punching it into the computer for analysis. A Statistical Package for Social Sciences (SPSS) software was used for the analysis. Descriptive statistics namely: means/averages, standard deviations and percentages, were used to analyze all objectives. The hypotheses where independent variables were: performance in agriculture in KCSE examinations, perceptions toward farming and post-secondary school farming experience, a regression analysis tests were used 0.05 alpha level. The regression used was categorical, which is a modification of the simple linear regression, where the variables used are in categorical form. The model adopted was:  $y = a + bx$ ,

Where:  $y$  = independent variable (performance in farming),

$a$  = constant,

$b$  = regression coefficient and,

$x$  = dependent variable (performance at KCSE, perception to farming and farming experience).

Categorical regression analysis test was preferred on the basis of its suitability in comparing two categories (independent variables and dependent variables) of data to describe their relationship, thereby providing a mechanism for prediction. The hypotheses where independent variables were gender of the respondent and attendance or non attendance to post-secondary school farmer training, Chi-square tests were used at 0.05 alpha level. Chi-square test was preferred because of its suitability as a non-parametric that tries to compare two frequencies and predict the outcome.

## **IV. FINDINGS AND DISCUSSION**

### **4.1 Introduction**

The problem that was investigated by this study is that a quarter a century has elapsed since the advent of the 8-4-4 system of education, which advocated more on creation of self-employment among school leavers. Yet, despite more secondary school agriculture graduates finishing secondary school, and presumably taking up farming for self-employment, agriculture role in economic development is declining. Today many of these graduates are jobless and underemployment in the country is assuming a crisis proportions. The country is faced with food scarcity that is currently pushing the prices for food and non-food agricultural commodities up while her education system continues to equip human resource with essential skills in farming for sustainability and prosperity.

### **4.2 Influence of Post-Secondary School Farmer Training on the Level of Income from Farming**

With respect to this variable, data on whether post-secondary school farmer training influenced the level of performance in farming were obtained by ticking in the blank boxes provided either YES for attendance and NO for non-attendance of farmer training, between 2007 and 2009. Those who attended training were required to indicate the number of times they attended the farmer training for the last three years.

To determine whether post-secondary school farmer training influences the level of performance in farming among SSAGs. Data on this variable were analyzed using averages and percentages. The findings are presented followed by discussions.



**4.2.1 Influence of attendance/non attendance to farmer training on income from cereal production**

The respondents in cereal production who attended post-secondary farmer training in the years between 2007 and 2009 were 43% while those who did not attend were 57%. The findings on this data are presented in Table 2.

**Table 2: Influence of Attendance/Non Attendance to Farmer Training by SSAGs in relation to Income from Cereals Production**

Enterprise Income	Post-secondary school farmer training		N	%
	Not attended	Attended		
Below average	31	11	42	97.7
Average	0	1	1	2.3

Most responses on income from cereal production show (97.7%) of respondents who attended seminars were ranked below average, with (2.3%) ranked average.

**4.2.2 Influence of attendance / non attendance to farmer training by SSAGs on income from horticultural production**

Findings on this data are presented in Table 3.

**Table 3: Influence of Attendance/Non Attendance to Farmer Training by SSAGs in relation to Income from Horticultural Production**

Enterprise Income	Post-secondary school farmer training		N	%
	Not attended	Attended		
Below average	16	4	20	90.9
Average	1	1	2	9.1

The findings on influence of attendance or non attendance to farmer training seminars pointed out that, (90.9%) of income from horticultural production was ranked below average, while (9.1%) was ranked average.

**4.2.3 Influence of attendance or non attendance to farmer training on income from coffee production**

The findings on data from this variable are presented in Table 4.

**Table 4: Influence of Attendance/Non Attendance to Farmer Training by SSAGs in relation to Income from Coffee Production**

Enterprise Income	Post-secondary school farmer training		N	%
	Not attended	Attended		
Below average	20	2	22	81.5
Average	4	1	5	18.5

Income from coffee production show majority of the respondents (81.5%) was ranked below average, while (18.5%) was ranked average.

**4.2.4 Influence of attendance or non attendance to farmer training on income from dairy cattle**

Details on the results of this variable are presented in Table 5.

**Table 5: Influence of Attendance/Non Attendance to Farmer Training by SSAGs in relation to Income from Dairy Cattle Production**

Enterprise Income	Post-secondary school farmer training		N	%
	Not attended	Attended		
Below average	4	2	6	42.8
Average	3	1	4	28.5
Above average	1	3	4	28.5

The findings indicate that, (42.8%) of the respondents' income from diary cattle production was ranked below average, while (28.5%) was ranked average and another (28.5%) above average.

**4.2.5 Influence of attendance or non attendance to farmer training on income from beef cattle, sheep and goats production**

Data on this variable is presented in Table 6.

**Table 6: Influence of Attendance/Non Attendance to Farmer Training by SSAGs in relation to Income from Beef Cattle, sheep and goats Production**

Enterprise Income	Post-secondary school farmer training		N	%
	Not attended	Attended		
Below Average	14	8	22	95.7
Above Average	0	1	1	4.3

The findings on income from most respondents were that, (95.7%) was ranked below average, while (4.3%) was ranked above average.

**4.2.6 Influence of attendance or non attendance to farmer training on income from poultry production**

The findings on this variable are presented in Table 7.

**Table 7: Influence of Attendance/Non Attendance to Farmer Training by SSAGs in relation to Income from Poultry Production**

Enterprise Income	Post-secondary school farmer training		N	%
	Not attended	Attended		
Below average	27	7	34	78.3
Average	2	1	3	21.7

In poultry production findings show that, income from most of the respondents (78.3%) was ranked below average, and (21.7%) was ranked average. Of all respondents, 43% attended post-secondary school farmer training and 57% did not. Most responses on income from cereals of those who attended seminars were ranked below average with most respondents (73.8%) being ranked "below average" in attendance of seminars and 28.2% being ranked "average".

To test the hypothesis that there is no statistically significant influence of post-secondary school farmer training on the level of performance in farming by SSAGs; data were subjected to Chi-square testing to determine the influence of post-secondary school farmer training on the level of performance in farming. The results of the tests were given and discussed as shown in Table 8.

**Table 8: Statistical Findings on Post-Secondary School Farmer Training in relation to Income from Farming**

	Value	df	Asymp. Sig. (2-sided)
Chi-Square	24.982(a)	19	.161
Likelihood Ratio	29.301	19	.061
Linear-by-Linear Association	1.561	1	.212
N of Valid Cases	43		

Post-secondary school farmer training were found to have no statistically significant influence on performance in farming of SSAGs (Chi-Square value = 24.982, df = 19, p=0.161). The null hypothesis could not be rejected. This means that for those who attended seminars and those who did not, their level of performance in farming was the same. This finding did not agree with the commonly believed facts that, attendance to farmer training enhances farmer's knowledge and skills in farming. Findings by <sup>30</sup> reveals that, skills and knowledge can be passed on to youth programme members through seminars, on farm demonstrations, extension field visits, technical teaching materials, agricultural shows, field days, mass media among others. Although in the current study 43% of the farmers attended post-secondary school farmer training while 57% did not. It was found that, attendance of farmer training such as seminars/workshops had no significant influence on farming.

The reasons for this could be attributed to other independent variables whose effect on level of performance was beyond the scope of the study. These variables could have masked the effects of the relationships of the variable under study and performance in farming. One of the variables could have been unfavourable weather that occurred during the study period (2007-2009) where even streams dried up.

Additionally, these farmers were dependent on rain-fed agriculture. Failure of rains meant that the performance of agriculture was below average for all farmers. In this regard, the effect of the variables under study (performance of agriculture at KCSE examinations, perception towards agriculture subject, post-secondary school farming experience, gender of respondents, and attendance of post-secondary school farmer training seminars) on performance in farming was interfered with and it is possible that the results could have been different if the weather conditions were favourable.

## **V. CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

The study was conceptualized within the context of the relevancy of the agriculture education in secondary schools to the needs of Kenyans. Agriculture was identified as a source of livelihood of over 80 percent of the population.

### **5.2 Conclusions**

With regard to objective, hypothesis and the findings of this study, the following conclusions were drawn: Those farmers who attended seminars and workshops, the income from most of them was ranked below average just as for the farmers who did not attend implying the seminars/workshops had no significance to this study. Indeed on testing the study hypothesis, the researcher established that there was no statistically significant relationship between performance in farming and post- secondary school farmer training.

### **5.3 Recommendations**

The findings from this study elicited a number of recommendations that are in line with policy issues revolving around teaching of agriculture subject in secondary schools. The recommendations are:

- i. Secondary school agriculture should be backed with post-secondary training on farming to fully orientate secondary school agriculture graduates.
- ii. Agriculture teachers should reinforce the agriculture learning through community outreach programmes where learners interact with agriculture researchers and commercial farmers.
- iii. There is need to do tracer studies where specific secondary agriculture graduates who have graduated from a given secondary school are followed up to establish if there are major variations in farming performance among graduates from same school and same agriculture teacher.

## **REFERENCES**

- [1]. Ary, D., Jacob, L.C., & Razevieh, A. (1979). Introduction to research in education. New York: Hort, Rinehart and Winston.
- [2]. Borg, W.R. (1987). Applying educational research. A practical guide for teachers (2<sup>nd</sup> ed). New York: Longman, Inc. White Plains.
- [3]. Carney, G., Drinkwater, M., Rusinow, T., Neefjes, K., Wanmali, S., & Sigh, N. (1999). Livelihood approaches compared. London: McGraw Hill Publishing.
- [4]. Chitere, P.A., & Van Doorne, J.H. (1985). Extension education and farmers performance in improved crop farming in Kakamega District. *Agricultural Administration*, 18(2), 8-13.
- [5]. David, N., & Otsuba, J. (1993). *Agricultural diversification for growth and equity in agricultural technology*. Washington, D.C: Oxford Press.
- [6]. Dellere, R. (1988). *Food and nutritional strategies concepts: Objectives and application*. Brussels: Royal Academy.
- [7]. Dove, A. Linda. (1980). Role of schools in communities Development, London: *Journal of Comparative Education*. 16 (1) 17 - 21
- [8]. Government of Kenya (GOK). (1964). Kenya education commission report, part 1. Nairobi: Government Printer.
- [9]. Government of Kenya (GOK). (1966). Development plan (1966 – 1970). Nairobi: Government Printer.
- [10]. Government of Kenya (GOK). (1970). Development plan (1970 – 1974). Nairobi: Government Printer.
- [11]. Government of Kenya (GOK). (1974). Development plan (1974 – 1978). Nairobi: Government Printer.
- [12]. Government of Kenya (GOK). (1976). Report of the national committees of education objectives and policies. Nairobi: Government Printer.
- [13]. Government of Kenya (GOK). (1979). Development plan (1979 – 1983). Nairobi: Government Printer.

- [14]. Government of Kenya (GOK). (2006). Strategic development plan (2006-2010). Nairobi: Government Printer.
- [15]. Government of Kenya (GOK). (2004). Education sector strategy plan, Ministry of Education, Science & Technology, Nairobi: Government Printer.
- [16]. Government of Kenya (GOK). (2009). The 2009 Kenya Population & Housing Census. Nairobi: Government Printer.
- [17]. Hespe, S. (2000). Expert opinion on the future of Agricultural Education, Illinois, USA: Urban Champaign Press.
- [18]. International Monetary Fund (IMF). (2000). Interim poverty reduction strategy papers. Washington, D.C: International Monetary Fund.
- [19]. International Monetary Fund (IMF). (2003). Kenya: Poverty reduction strategy paper preparation status report. Washington, D.C: International Monetary Fund.
- [20]. Kathuri, N.J. (1981). The status of agriculture and its relevance to schools, colleges, and universities of Kenya. Proceedings of the third Conference of Kenya Agriculture Teachers Association. Njoro: Egerton University.
- [21]. Kathuri, N.J. (1986). Prospects and problems in secondary schools agricultural education programme of Kenya. Nairobi: Kenyatta University.
- [22]. Kathuri, N.J. (1990). A Study of the new agricultural education in the secondary schools of Kenya (Unpublished Ph.D. Dissertation). Urbana Champaign: University of Illinois.
- [23]. Kathuri, N.J., & Pals, A. (1993). Introduction to educational research. Njoro, Kenya: Educational Media Centre, Egerton University.
- [24]. Kenya Institute of Education (KIE). (1985). Secondary school agriculture syllabus for Kenya Certificate of Secondary School Education. Nairobi: Kenya Institute of Education.
- [25]. Kenya Institute of Education (KIE). (1992). Secondary school agriculture syllabus for Kenya Certificate of Secondary School Education. Nairobi: Kenya Institute of Education.
- [26]. Kenya Institute of Education (KIE). (2002). Secondary school agriculture syllabus for Kenya Certificate of Secondary School Education. Nairobi: Kenya Institute of Education.
- [27]. Kigutha, N. (1995). Effects of season on household security and the nutritional status of small holder rural households in Nakuru District (Published Ph.D Thesis). In Wagengen: Netherlands.
- [28]. Kipkemei, P. (2004). Contribution of secondary school agriculture knowledge to rural productivity among small-scale farmers in Uasin Gishu District (Unpublished M.Sc. Thesis). Njoro, Kenya: Egerton University.
- [29]. Lipton, M. (2005). The family farm in a globalizing world: The role of crop science in alleviating poverty. Southern African Regional Poverty Network-Agriculture.
- [30]. Ministry of Agriculture, Livestock Development and Marketing (MOALDM), (2001). Issue papers and education content and delivery systems related to the rural youth programme. Retrieved 18<sup>th</sup> August 2010 from [www.fao.org/docrep/n1765e/coe,w/765/htm](http://www.fao.org/docrep/n1765e/coe,w/765/htm).
- [31]. Maxwel, R.H. (1960). A Pilot agricultural education programme at Chavakali Secondary School. Western Kenya (Unpublished M.A Thesis). Ithaca, New York: Cornell University.
- [32]. Maxwel, R.H. (1970). The relationship between social differences to academic success in secondary schools and occupational patterns in Kenya. The Chavakali Case (Unpublished Ph.D. Thesis). Ithaca, New York: Cornell University.
- [33]. Mugenda, O.M. & Mugenda, G.D. (2003). Research methods: Quantitative and qualitative approaches. Nairobi: ACTS Press.
- [34]. Murillo, G. (2004). Education, Entrepreneurship and Community Development Centre for Science Industry and Natural Resources, New York: Shesta College Redding C.A.
- [35]. Mwangi, J.G. (1998). Contributions of education and research to national development with special reference to Kenya. Egerton Journal of Humanities, Social Sciences and Education, 2(1), 7-12.
- [36]. Oluoch, G.P. (1982). Essentials of curriculum development. Nairobi: Elimu Bookshop.
- [37]. Onyango, C.A. (1975). The Establishment of secondary school agriculture and its contribution to rural development in Kenya (Unpublished M. Philosophy Thesis), Reading: University of Reading.
- [38]. Sheffield, J.R., Morris, J. R. & Hermans, J. (1976). The Agriculture in African secondary schools; Case studies of Botswana, Kenya and Tanzania. 22-38, New York: The African American Institute.
- [39]. Stabler, E. (1969). Education since uhuru, the schools of Kenya. Connecticut: Wesleyan University Press.
- [40]. Tyler, S.R. (2006). Communities livelihoods and natural resources. Warwickshire, U.K: Intermediate Technology Publications.

- [41]. United Nations Education, Science & Culture Organization (UNESCO, 1998). World conference on higher education, Higher education in the 21<sup>st</sup> century, vision and action volume 1-plenary. New York United Nations Children's Fund (UNICEF).
- [42]. Wadie & Mulhall, (2002). Youth and rural livelihoods in Kenya and Tanzania. Retrieved 8<sup>th</sup> August, 2010 from website: [www.Youth livelihoods. Infor](http://www.Youth livelihoods. Infor).
- [43]. World Bank, (1988). Education in sub-Saharan Africa: policies for adjustments, revitalisation and expansion. Washington D.C: World Bank.

Stephen Kyalo Mutiso. "Post-Secondary School Farmer Training and Its Influence on the Level of Performance in Farming in Kangundo and Matungulu Sub-Counties, Kenya." IOSR Journal of Humanities and Social Science (IOSR-JHSS). vol. 24 no. 06, 2019, pp. 79-91.