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Skills Utilization and Developed Perception on Performance in Farming by Secondary School Agriculture Graduates in Kangundo District, Kenya

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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 agriculture performance at examinations, perceptions toward farming while at school, post-secondary school farming experience, gender of the farmers, and post-secondary school farmer training. These factors need to be studied because they have been scarcely studied and documented in Kenya. 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 District. 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 secondary school agriculture graduates used the farming skills learned at school in their farms. Majority of the graduates had positive perceptions towards farming while at school. The major conclusion of the study were that, most farmers had positive attitudes toward farming while at school, and that most of them practised the farming skills acquired at school. The study therefore recommends that, the teaching of agriculture at secondary school need to be strengthened by agriculture teachers and focused more on self-reliance in farming after schooling. The agriculture teachers should motivate learners to view farming as an industry with dynamism in job creation for various career affiliations in farming.***

Keywords: Skills Acquired, Perception Developed, Secondary School Agriculture Graduates, *Ex-Post Facto*

1. Introduction

1.1 Background of the Study

Kenya's economy is agriculturally based [14]. 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 [4]. Despite enormous efforts to industrialize, Kenya has remained an agricultural nation since independence [27]. 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 [27].

Kenyan youth constitute 78.31 percent of the total population [15]. The youth by definition refer to persons in the period between teenage and young adulthood [40]. The [43] 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 [15]. Given the high population growth in Kenya, the youth population is expected to double by 2045, further increasing pressure on job creation [43]. It is, therefore, expected that, most of the employment opportunities that will be created will be agriculture related and will target these youth [41]. 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 [43].

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 [35]. It means to transmit relevant attitudes, knowledge and skills needed in life after school [35]. 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 (Kenya Institute of Education [23]. 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 [25].

Agriculture was identified as a major vehicle for transmitting farming skills to the youth [27]. It was hoped it would orientate them better to exploit their immediate environment for livelihoods.

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. It is against this background that, the study on the influence of the selected factors on performance in farming by secondary school agriculture graduates was carried out.

1.3 Objectives of the Study

Specifically, the study sought to address the following objectives:

a) To determine whether the secondary school agriculture graduates (SSAGs) were utilizing agricultural skills acquired in secondary school in Kangundo District, Kenya.
b) To assess whether the perception developed while at school toward farming influences the level of performance in farming by SSAGs in Kangundo District, Kenya.

1.4 Significance of the Study

The study examined in a real-life setting the implementation of a programme based on the theory of "self-reliance", that has been widely accepted by the proponents of the 8-4-4 system of education, but scarcely been tested in Kenya. The study outcome may help to improve agriculture curriculum development by providing a basis for reference in curriculum development in secondary schools. Consequently, it may open opportunities for research in the content of agriculture subject. The study is also hoped it would motivate the would-be SSAGs to take up self-employment in farming. Lastly, curriculum developers may use the findings of the study to understand and define agriculture learner's needs and roles.

2. Literature Review

2.1 Youth and Unemployment in Africa

[43] 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 [43].

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 [15]. 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 [43].

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 [7]. 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 [40]. 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 there 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 [33].

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 [16]. Schools-community linkage can also be an in-reach program whereby schools open their doors and allow communities to come and learn certain skills [33]. 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 [7]. One of the

global aims of education is solving continuing problems that plague humanity such as unemployment and huger. 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 [40] According to [7], 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 [33].

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 [7]. Throughout the 19th and 20th 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 [33].

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 [17]. 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 [18].

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 [17]. 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 in 1960.
The programme had three basic objectives:

1) Making rural secondary education more practical and more responsive to developmental needs of Kenya;
2) developing the school as a demonstration area, and generate enthusiasm and willingness to work among the students; and
3) relating agricultural subject to: the entire school programme, development of the region and country and life and future of the students [30].

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 [30]. 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 [21]. 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 [38].

Agriculture subject became officially established in the school curriculum at several phases in the slow development of colonial education [37]. The Ominde Commission of 1964 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 [8, 9, 10 and 12] took the Commission's observations seriously and made provisions for expansion of agricultural education to have more secondary schools teaching agriculture. Subsequent reports [11] and studies [31, 36, 37, 19, 20 and 21] have consistently shown that there is a lot of potential for making the subject more pragmatic and useful to national development.

[42] 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 [42], "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

[11] 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, [11] 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 [11]. 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 [24]. 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 [24] 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 [24].

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 [13].

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 [13].

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 [17]. 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 [18].

[28] 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:

1) Lower labour related transaction costs, and more family workers per hectare, each motivated to work and find, screen and supervise hired workers; and
2) 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 [28] 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:

1) Total Factor Productivity (TFP) growth on farms via locally profitable employment-intensive technology;
2) Land and water that are neither very unequally distributed nor unsustainably used; and
3) 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 [28].

2.6 Agricultural Diversification for Increased Income and Food Security

Agricultural diversification is defined broadly as the increased variety of agricultural commodities produced [5]. 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 [6]. [34] 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 [26]. Poverty is a major course 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 [6].

A well chosen crop and livestock can mean the difference between survival and starvation [5]. 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 [5].

2.7 Theoretical Framework of the Study

The study was guided by [3] 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. [3] 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 [3]. 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 [39]. In this study, livelihoods related to performance in farming, whereas Carney's factors for livelihoods related to the selected factors investigated in the study.

2.8 Conceptual Framework of the Study

In this study, therefore, selected factors have been related to Carney's livelihood factors, and outlined as: (1) acquisition of secondary school agriculture skills, (2) perceptions developed on farming while at school.

The study entailed the use of a conceptual framework which related independent variables (selected factors) to a common dependent variable (performance in farming), and the intervening variables (market forces, control over land, access to capital, and agricultural extension services) (Figure 2.1). To minimize the effects of these intervening variables, the researcher used respondents who besides having acquired agriculture knowledge at secondary school were also sharing the same agro climatic conditions and geographical location with similar socio-economic characteristics.

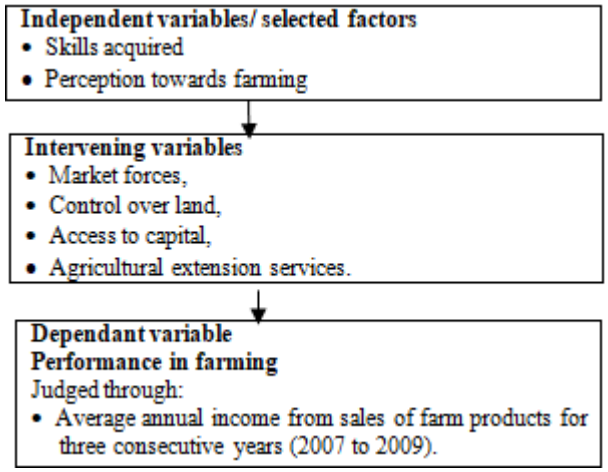

Figure 2.1: Conceptual Framework of the Relationship between Independent, Intervening and Dependent Variables

The independent variable(s) in (Figure 2.1), with respect to independent and intervening variable(s) were measured as follows: Influence on perception towards farming was determined by supplying the respondents with pre-determined statements, some in favour for agriculture subject and others not in favour. A score scale of 1 to 5 with 5 being the highest score for those statements in favour for agriculture subject and yet the lowest score for statements not in favour for the subject was also supplied.

The dependent variable on performance in farming was determined by subjecting the respondent to supply information on categorized ranges of annual income from the agricultural enterprises for the last three years (2007-2009) so as to get estimates of total and average revenues obtained from the farm per annum. Lastly to minimise the effects of the intervening variables (market forces, control over land, access to finances and agricultural extension services), statistical testes (categorical regression and Chi-square) with an error allowance of 0.05 alpha level were used.

3. 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 [1]. 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 District. 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 District, Eastern Province. The area was chosen for the study due to its ecological conditions that make farming a predominant economic activity. The District is carved from the former larger Machakos District, and has two main divisions, that is Kangundo and Matungulu. In the entire District, farmers with desired characteristics were identified through snow ball sampling method. Kangundo District has an approximate population of 258,895 [15]. The rainfall in the District 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 [29].

The above attributes favour farming activities. The District has 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 district. Apart from these plantations and ranches which today are owned and managed by farmer cooperative societies, the rest of the district is highly fragmented into small scale holdings, ranging from 1 to 10 acres [29]. The main agricultural enterprises carried out in the District 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 District 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 [22, 2] 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 District. Therefore, to access them, the researcher used a snow ball sampling technique [32]. A snow ball sampling technique recommends 100 respondents as the minimum number for *ex-post facto* and survey studies. According to the [15], 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 entire District.

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 District were all small scale (between 1 ≤ 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 3.1). Questionnaires from three farmers failed the test for inclusion into the study for luck of enough information in terms of enterprise diversification and data on incomes obtained for the three consecutive years (2007-2009).

Table 3.1: Distribution of Respondents per Division and Location (N=100)

Division	Location	Frequency	Percentage
Kangundo	Kanzalu	10	10.0
	Kivaani	8	8.0
	Kawethei	9	9.0
	Kangundo	14	14.0
	Kakuyuni	9	9.0
Matungulu	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
Total		100	100

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 out puts 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 [1]. 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

After formalizing the research exercise in the District, the researcher made contacts with the already identified respondents. Arrangements on the dates and times of visits were finalised. Since Kangundo District 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 entire District 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 = dependent variable (performance in farming),
a = constant,
b = regression coefficient and,
x = independent variable (skills acquired, perception to farming).

4. Findings and Discussion

4.1 Utilization of Agriculture Skills in Farming

Skills/operations on the agricultural enterprises were identified from secondary school agriculture syllabus. The agriculture skills were tailored to the enterprises under which they are practised and presented as:

1) Dairy cattle production, where the skills observed were; zero grazing, feeding and nutrition, selection and breeding, fodder production and conservation, and records keeping.
2) Poultry production, where skill investigated included: records keeping, market survey for poultry products, control of parasite and diseases, feeding and rearing, and proper housing.
3) Beef cattle/sheep/goats production identified skills were: feeding and nutrition, parasite and disease control, selection and breeding, fodder production and conservation, and records keeping.
4) Coffee production operation identified as: pruning, soil and water conservation, soil fertility, control of weeds/pests/diseases, harvesting, and records keeping.
5) Cereals production (maize/beans/pigeon peas) identified skills were: soil and water conservation, soil fertility, weeds/pests/disease control, harvesting and marketing, and records keeping.
6) Horticultural production (vegetables/fruits/root crops) whose skills are: soil and water conservation, soil fertility, weeds/pests/disease control, harvesting and marketing, and records keeping.

Objective 1: To determine whether the secondary school agriculture graduates (SSAGs) were utilising agricultural skills and knowledge acquired in secondary school

This objective determined whether secondary school graduates utilized agricultural skills /operations acquired in secondary schools in diverse agricultural activities on their farms. The respondents were required to score the degree to which they utilized the acquired knowledge in the agricultural enterprises. Scoring was done for three consecutive years between 2007 and 2009, against a score scale of 1 to 5, with 5 being the highest score. After the scoring was done, the average score for each farming activity was ranked. The ranks were: ≤ 2 = below average, 3 = Average and ≥ 4 = above average.

4.1.1 Utilization of skills in dairy cattle production

When the data were analyzed, they revealed that, out of 100 farmers studied, 23 kept dairy cattle. On average the score denoting the utilization of skills in various activities of dairy cattle keeping was 3.65±0.11. The minimum score was 2.67, while the maximum was 4.67. The findings were further subjected to ranking on the basis of: Below average, Average and above average scores in the various activities and the results presented as shown in Table 4.2.

Table 4.2: Skill Utilisation in Dairy Cattle Production

	Categories of Skill Utilization Scores (%)		
Skill	Below average ≤ 2	Average 3	Above average ≥ 4
Zero grazing	6.45	12.90	80.64
Feeding & nutrition	0.00	32.26	67.74
Parasite & disease control	0.00	25.81	74.20
Breeding & selection	3.23	35.48	61.29
Fodder production & conservation	6.45	19.35	74.20
Recording keeping	3.23	38.71	58.06
Aggregate % score	3.22	27.41	69.35

After ranking, the findings were that, zero grazing, fodder production and conservation, and parasite and disease control had the highest proportion of scores that ranked "above average" 80.64% and 74.20% respectively (Table 4.2). The activities with the highest proportion of scores that ranked "average" were records keeping (38.71%), breeding and selection (35.48%), and feeding and nutrition (32.26%). The activities with a proportion of utilisation scores that ranked "below average" were fodder production and conservation, and zero grazing both at (6.45%), record keeping and breeding and selection both with (3.23%) scores. The aggregate percentage scores for, above average, average and below average were 69.35%, 27.41% and 3.22%, respectively.

4.1.2 Utilisation of skills in poultry production

Farmers were required to score the utilization of selected skills on poultry keeping. The results of the data gathered showed that, 93% of the farmers used in the study practiced poultry keeping. The aggregate score for utilization of skills was 3.48± 0.07. The minimum and maximum aggregate scores were 1.80 and 5.00, respectively.

Table 4.3: Skill Utilisation in Poultry Production

	Categories of Skill Utilization Score (%)		
Skill	Below average ≤ 2	Average 3	Above average ≥ 4
Poultry record keeping	8.6	51.6	39.8
Market survey for products	8.6	32.3	59.1
Control of parasites & diseases	1.1	31.2	67.8
Feeding & rearing of poultry	1.1	34.4	64.6
Proper housing	1.1	49.5	49.5
Aggregate % score	4.1	39.8	56.16

After ranking the activities with the highest percentage of scores in the "above average" category were, control of parasites and diseases (67.8%), feeding and rearing of poultry (64.6%) and market survey for product (59.1%). The highest proportion of "below average" score was in record keeping and market survey for products both at 8.6%. While the highest proportion of "average" scores were in poultry record keeping (51.6%) and proper housing of poultry (49.5%). The aggregate percentage scores for above average, average and below average were 56.16%, 39.8% and 4.1%, respectively (Table 4.3).

4.1.3 Utilisation of skills in beef cattle/sheep/goats production

On utilization of selected skills in beef cattle, sheep and goats, farmers were required to score for them as one enterprise. The results indicated that, 38% of the farmers practised beef cattle, sheep and goats farming. The aggregate score for utilization of agricultural skills were 3.54±0.09. The minimum and maximum were 2.47 and 4.47, respectively.

Table 4.4: Skill Utilisation in Beef Cattle/Sheep/Goats Production

Skill	Categories of Skill Utilization Score (%)		
	Below average ≤ 2	Average 3	Above average ≥ 4
Feeding and nutrition	0	28.9	71.0
Parasites and disease control	5.3	13.2	81.6
Breeding and selection	10.5	23.7	65.8
Fodder production & conservation	2.6	34.2	63.2
Record keeping score	18.4	44.7	36.9
Aggregate % score	7.36	28.94	63.7

The highest proportions of utilisation scores for all activities except record keeping were ranked "above average" (Table 4.4). For instance, 81.6%, 71.0%, 65.8% and 63.2% of the utilisation scores in parasite and disease control, feeding and nutrition, breeding and selection, and fodder production and conservation were ranked "above average". The highest proportion of utilisation of scores in record keeping (44.7%), were ranked "average". While in the "below average" category, records keeping, and breeding and selection had the highest proportions that is 18.4 and 10.5 respectively. The aggregate percentage scores for the categories, above average, average and below average ranked 63.7%, 28.94% and 7.36%, respectively.

4.1.4 Utilisation of skills in coffee production

Regarding utilisation of selected skills in coffee farming, results from data gathered showed that, 62% of the farmers studied practiced coffee farming. The aggregate score for utilisation of skills was 4.02±0.08, with a minimum and maximum of 2.61 and 5.00, respectively.

Table 4.5: Skill Utilisation in Coffee Production

Skill	Categories of Skill Utilization Score (%)		
	Below average ≤ 2	Average 3	Above average ≥ 4
Pruning	8.1	16.1	74.8
Soil & water conservation	3.2	19.4	77.4
Soil fertility	1.6	19.4	79.1
Control of weeds/pests/diseases	3.2	21.0	75.8
Harvesting & marketing	1.6	9.7	88.8
Record keeping	12.9	12.9	74.2
Aggregate % score	5.1	16.41	78.35

When ranked, 78.35% of the aggregate percentage scores were ranked "above average", and 16.41% average and 5.48% (Table 4.5). The highest proportion of utilisation scores in harvesting and marketing (88.8%), soil fertility (79.1%), soil and water conservation (77.4%), control of weeds/pests/diseases (75.8%), pruning (74.8%) and records keeping (74.2%) were ranked "above average". The activities with the highest proportion of utilization scores in the "below average" category were record keeping (12.9%) and pruning (8.1%). While the highest proportion of scores in the "average" category were control of weeds/pests/diseases (21.0%), soil and water conservation and soil fertility both with (19.4%) and pruning (16.1%).

4.1.5 Utilisation of skills in cereals (maize, beans and pigeon peas) production

Regarding utilisation of selected skills in maize, beans and pigeon pea farming, the data obtained revealed that, 97 farmers out of 100 practised maize, beans and pigeon pea farming, where the aggregate utilization score 3.93±0.07. The minimum and maximum scores were 2.00 and 5.00, respectively.

Table 4.6: Skill Utilization in Cereals (Maize, Beans and Pigeon peas) Production

	Categories of Skill Utilization Score (%)		
Skill	Below average ≤ 2	Average 3	Above average ≥ 4
Soil & water conservation	2.0	13.3	84.7
Soil fertility	3.0	15.2	81.9
Weeds/ pests/ diseases control	2.0	13.1	84.9
Certified seeds	4.0	22.2	73.7
Harvesting, processing &storage	2.0	9.1	88.9
Market survey for produce	12.1	18.2	69.7
Record keeping	13.3	26.5	60.2
Aggregate % score	5.48	16.8	77.71

After ranking, the activity with the highest proportion of score in the "above average" category were harvesting, processing and storage (88.9%), weeds/pests/disease control (84.9%), soil and water conservation (84.7%) soil fertility (81.9%) and certified seeds (73.7%). The activities with the highest proportion of utilisation scores ranked "below average" were record keeping (13.3%) and market survey for produce (12.1%). While the highest proportions of the "average" category were, records keeping (26.5%), certified seeds (22.2%), and market survey for produce (18.2%). The aggregate percentage scores for the categories above average, average and below average were 77.71%, 16.8% and 5.48% respectively, (Table 4.6).

4.1.6 Utilisation of skills in horticultural (vegetables, fruits and root crops) production

For the utilisation of selected skills in vegetables, fruits and root crops farming, results showed that, for the 50 farmers out of 100 studied, the aggregate average utilisation score was 4.48±0.08, with minimum and maximum being 3.2 and 5.0 respectively.

Table 4.7: Skill Utilisation in Horticultural (Vegetables, Fruits and Root crops) Production

Skill	Categories of Skill Utilization Score (%)		
	Below average ≤ 2	Average 3	Above average ≥ 4
Soil and water conservation	0	0	100
Soil fertility	0	0	100
Weeds/ pests/ diseases control	0	6	94
Harvesting and marketing	0	2	98
Record keeping	4	12	84
Aggregate % score	0.8	4.0	95.2

The highest proportion of utilisation scores for all the activities were ranked "above average" (Table 4.7). In all activities, the proportion of scores in the above average category ranged between 84% and 100%. In the aggregate percentage score, 95.2% of all the scores were in the above average category, 4.0% in the average and 0.8% in the below average categories.

In this study, farmers had a high aggregate utilisation of agricultural skills score of 3.65 (out of a total of 5.00). This finding was expected and agrees with [27] findings that, farmers with secondary school agricultural knowledge performed significantly better in all farming aspects as compared to farmers without secondary agricultural knowledge. The findings further agreed with [27] findings that, agriculture education in school and colleges is one of the ways of expanding agricultural development of this nation. This also is in line with the [42], that "without education, development will not occur. Only an educated person can command the skills necessary for economic growth".

4.2 Influence of Perceptions Developed at School toward Farming on Income from Farming

With respect to perceptions developed by secondary school agriculture graduates while in school on farming respondents were required to score for some pre-determined statements. These were:

1) Learning agriculture was satisfying;
2) Learning agriculture was hard;
3) Learning agriculture was boring; and

4) Learning agriculture made me curious to apply the skills learnt.

The statements comprised of both positive and negative perceptions for the purposes of making the respondents critically think before scoring. The scoring was done against a score scale of 1 to 5, where 1 was the lowest score for positive perceptions (i & iv), yet the highest for the negative perceptions (ii & iii).

Objective 2: To assess whether the perceptions developed while at school toward farming influences the level of performance in farming by SSAGs

For this objective, data were collected by scoring the predetermined statements selected to guide farmers in scoring perceptions that might have influenced them to choose to study agriculture subject and for go others. The scoring was done against a score scale of 1 to 5, with 1 being the lowest score and 5 the highest on the positive perceptions (i & iv). Yet 1 was the highest and 5 the lowest scores for negative perceptions (ii & iii). Ranking of the scores was done on the basis of: ≤ 2 for (i & iv) and ≥ 4 for (ii & iii) = Below average, 3 on (i & iv) and 3 for (ii & iii) = Average while ≥ 4 for (i & iv) and ≤ 2 for (ii & iii) = Above average. The scores were then compared to the average annual income from all the agricultural activities undertaken. The results were analysed using means/ averages and percentages, and ranked on the basis of: below average, average and above average. The findings are presented in Tables 17, 18, 19, 20, 21, and 22, each followed by discussions.

4.2.1 Influence of SSAGs satisfaction in learning agriculture on income from farming enterprises

The farming enterprises whose income were observed in relation to whether they were correlated to the perceptions secondary school agriculture graduates developed while still in school were: cereal, horticulture, coffee, dairy cattle, beef cattle /sheep/goats, and poultry production.

Table 4.8: Influence of SSAGs Levels of Satisfaction in Learning Agriculture in Relation to Income from Cereals Production

Enterprise Income	Learning agriculture was satisfying		N	%
	Average 3	Above Average ≥ 4		
Below average	10	86	96	98
Average	0	2	2	2

As shown in Table 4.8, most secondary school agriculture graduates ranked “satisfaction in learning agriculture” to be either above average or average. In spite of how satisfying agriculture was ranked, income from cereal production was ranked as below average by (98%) of the respondents, while (2%) was ranked average.

Table 4.9: Influence of SSAGs Levels of Satisfaction in Learning Agriculture in Relation to Income from Horticulture Production

Enterprise Income	Learning agriculture was satisfying		N	%
	Average 3	Above Average ≥ 4		
Below average	5	41	46	95.8
Average	0	2	2	4.2

The findings on the level of satisfaction in learning agriculture was ranked above average by 43 respondents out of the 48 engaged in horticultural production and average by 5 respondents. However, in spite of how satisfying the learning of agriculture was, income from horticultural production was ranked below average by the majority (95%) while only (2%) was ranked average.

Table 4.10: Influence of SSAGs Levels of Satisfaction in Learning Agriculture in Relation to Income from Coffee Production

Enterprise Income	Learning agriculture was satisfying		N	%
	Average 3	Above Average ≥ 4		
Below average	8	48	56	91.8
Average	0	5	5	8.2

The finding on the level of satisfaction in learning agriculture in respect to income from coffee production has no correlation. (91.8%) of the secondary school agriculture graduates ranked below average on income accruing from coffee production, while (8.2%) ranked average. This was in spite of majority of coffee farmers showing above average satisfaction in learning agriculture at secondary school.

Table 4.11: Influence of SSAGs Levels of Satisfaction in Learning Agriculture in Relation to Income from Dairy Cattle Production

Enterprise Income	Learning agriculture was satisfying		N	%
	Average 3	Above Average ≥ 4		
Below average	4	14	18	78.2
Average	0	5	5	21.8

The numbers of secondary school agriculture graduates engaged in diary cattle production were 23. Income from this enterprise was ranked as below average by (78.2%) by the respondents, while (21.8%) was ranked average. This was irrespective of most respondents scoring satisfaction in learning agriculture while at school.

Table 4.12: Influence on SSAGs Levels of Satisfaction in Learning Agriculture in Relation to Income from Beef Cattle, Sheep and Goats Production

Enterprise Income	Learning agriculture was satisfying		N	%
	Average 3	Above Average ≥ 4		
Below average	4	14	41	95.2
Average	0	5	1	4.8

The findings indicate that, 43 respondents out of 100 practised beef cattle, sheep and goats production. Income from (95.2%) from the respondents was ranked below average, while (4.8%) was ranked average. This was irrespective of how satisfying learning agriculture was scored by the secondary school agriculture graduates.

Table 4.13: Influence of SSAGs Levels of Satisfaction in Learning Agriculture in Relation to Income from Poultry

Enterprise Income	Learning agriculture was satisfying		N	%
	Average 3	Above Average ≥ 4		
Below average	9	75	84	85.2
Average	0	4	4	14.8

As shown in Table 4.13, most respondents ranked “satisfaction in learning agriculture” to be either above average or average. In regard to poultry production, most

secondary school agriculture graduates (85.2%) ranked income from poultry as below average, while (14.8%) was ranked average. This was in spite of most respondents scoring above average and average in satisfaction to learning agriculture at school.

4.2.2 Influence of SSAGs responses on hardness in the learning of agriculture at school on income from farming

The findings on respondents' responses on hardness in the learning of agriculture are presented in Table 4.14 up to table 4.19.

Table 4.14: Influence of Hardness in Learning Agriculture by SSAGs in Relation to Income from Cereals Production

Enterprise Income	Learning agriculture was hard		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	55	42	97	97.9
Average	2	0	2	2.1

The findings indicate that, respondents responses on "learning agriculture was hard" were ranked to be either above average (they did not perceive agriculture was hard) or below average (they perceived agriculture as hard). On income from cereals, (97.9%) was ranked as below average, while (2.1%) was ranked average.

Table 4.15: Influences of Hardness in Learning Agriculture by SSAGs in Relation to Income from Horticultural Production

Enterprise Income	Learning agriculture was hard		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	55	42	46	95.8
Average	2	0	2	4.2

The findings show that, income from horticulture production was ranked below average by (95.8%) of the respondents, while (4.2%) was ranked average. This was irrespective of majority of them having perceived the learning of agriculture as not hard.

Table 4.16: Influence of Hardness in Learning Agriculture by SSAGs in Relation to Income from Coffee Production

Enterprise Income	Learning agriculture was hard		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	28	28	56	91.8
Average	3	2	5	8.2

The findings were that, income from coffee production was ranked as below average by (91.8%) of the respondents, while (8.2%) was ranked average.

Table 4.17: Influence of Hardness in Learning Agriculture by SSAGs in Relation to Income from Dairy cattle Production

Enterprise Income	Learning agriculture was hard		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	7	11	18	78.2
Average	4	1	5	21.8

Results were that, income from diary cattle production was ranked below average by (78.2%) of the respondents, while (21.8%) of them ranked average.

Table 4.18: Influence of Hardness in Learning Agriculture by SSAGs in Relation to Income from Beef Cattle, Sheep and Goats Production

Enterprise Income	Learning agriculture was hard		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	21	21	42	97.7
Above Average	1	0	1	2.3

The findings revealed that, income from beef cattle, sheep and goats production was ranked below average by (97.7%) of the respondents, while (2.3%) was ranked as average.

Table 4.19: Influence of Hardness in Learning Agriculture by SSAGs in Relation to Income from Poultry Production

Enterprise Income	Learning agriculture was hard		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	46	39	85	95.6
Average	4	0	4	4.4

The findings reveal that, income from poultry production was ranked as below average by (95.6%) of the respondents, while it was ranked as average by (4.4%) of them. As shown in Table 4.14 up to table 4.19, respondents responses on "learning agriculture was hard" were ranked to be either above average (they did not perceive agriculture was hard) or below average (they perceived agriculture as hard). In spite of how hard agriculture was ranked, results on income from different agricultural ventures by most respondents on income were ranked as below average.

4.2.3 Influence of SSAGs responses on boredom in the learning of agriculture at school on income from farming

The findings on this perception are presented in Table 4.20 up to table 4.25

Table 4.20: Influence of Boredom in Learning Agriculture by SSAGs in Relation to Income from Cereals Production

Enterprise Income	Learning agriculture was boring		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	54	43	97	98
Average	2	0	2	4.2

The results revealed that, (98%) of the respondents ranked income from cereals production as below average, whereas (2%) of them ranked it as average.

Table 4.21: Influence of Boredom in Learning Agriculture by SSAGs in Relation to Income from Horticulture Production

Enterprise Income	Learning agriculture was boring		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	26	20	46	95.8
Average	1	1	2	4.2

Income from horticulture production was ranked as below average by (95.5%) of the secondary school agriculture graduates, while (4.2%) of them ranked it as average.

Table 4.22: Influence of Boredom in Learning Agriculture by SSAGs in Relation to Income from Coffee Production

Enterprise Income	Learning agriculture was boring		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	29	27	56	91.8
Average	3	2	5	8.2

Regarding the income from coffee production, (91.8%) and (8.2%) of the respondents ranked it as "below average" and "average" respectively.

Table 4.23: Influence of Boredom in Learning Agriculture by SSAGs in Relation to Income from Dairy cattle Production

Enterprise Income	Learning agriculture was boring		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	6	12	18	78.3
Average	4	1	5	21.7

The findings indicate that, income from diary cattle production was ranked as below average by (78.3%) of the respondents, while (21.7%) of them ranked it as average.

Table 4.24: Influence of Boredom in Learning Agriculture by SSAGs in Relation to Income from Beef Cattle, Sheep, and Goats Production

Enterprise Income	Learning agriculture was boring		N	%
	Above Average ≥4	Below Average ≤ 2		
Below average	20	22	42	97.7
Above Average	1	0	1	2.3

The results indicate that, income from beef cattle, sheep and goats was ranked as below average by (97.7%) of the respondents, and as average by (2.3%) of them.

Table 4.25: Influence of Boredom in Learning Agriculture by SSAGs in Relation to Income from Poultry Production

Enterprise Income	Learning agriculture was boring		N	%
	Above Average ≥ 4	Below Average ≤ 2		
Below average	46	39	85	95.4
Average	4	0	4	4.6

The findings shows that, income from poultry production was ranked as below average by (95.4%) of the secondary school agriculture graduates, and (4.6%) as average by the rest.

As shown in Table 4.20 up to table 4.25, most respondents ranked "learning agriculture was boring" to be either above average or below average. Results of majority of respondents on income from different agricultural ventures were categorized below average.

4.2.4 Influence of SSAGs responses on curiousness to apply the agriculture skills learnt at school on income from farming

The findings on this perception are presented in Table 4.26 up to table 4.31.

Table 4.26: Influence of Curiousness to Apply the Agriculture Skills Learnt by SSAGs in Relation to Income from Cereals Production

Enterprise Income	Learning agriculture made me curious to apply the skills learnt			N	%
	Below Average ≤ 2	Average 3	Above Average ≥ 4		
Below average	2	33	63	97	98
Average	0	0	0	2	2

The table show responses from respondents on income from cereal production as (98%) and (2%) ranked below average, and average, respectively.

Table 4.27: Influence of Curiousness to Apply the Agriculture Skills Learnt by SSAGs in Relation to Income from Horticulture Production

Enterprise Income	Learning agriculture made me curious to apply the skills learnt			N	%
	Below Average ≤ 2	Average 3	Above Average ≥ 4		
Below average	0	12	34	46	95.8
Average	0	2	0	2	4.2

Results confirm income from horticulture (95.8%) ranked below average, while (4.2%) was ranked average.

Table 4.28: Influence of Curiousness to Apply the Agriculture Skills Learnt by SSAGs in Relation to Income from Coffee Production

Enterprise Income	Learning agriculture made me curious to apply the skills learnt			N	%
	Below Average ≤ 2	Average 3	Above Average ≥ 4		
Below average	1	23	32	56	91.8
Average	0	1	4	5	8.2

The finding on income from coffee production was ranked as below average by (91.8%) of the respondents, while (8.2%) was ranked average.

Table 4.29: Influence of Curiousness to Apply the Agriculture Skills Learnt by SSAGs in Relation to Income from Dairy cattle Production

Enterprise Income	Learning agriculture made me curious to apply the skills learnt			N	%
	Below Average ≤ 2	Average 3	Above Average ≥ 4		
Below average	1	7	10	18	78.3
Average	0	1	4	5	21.1

Responses from most respondents ranked income from diary cattle production (78.3%) as below average, while (21.1%) was ranked average.

Table 4.30: Income of Curiousness to Apply the Agriculture Skills Learnt by SSAGs in Relation to Income from Beef Cattle, Sheep and Goats Production

Enterprise Income	Learning agriculture made me curious to apply the skills learnt			N	%
	Below Average ≤ 2	Average 3	Above Average ≥ 4		
Below average	0	15	27	42	97.7
Above Average	0	1	0	1	2.3

The findings on income from beef cattle, sheep and goats production was ranked below average by (97.7%) respondents, while (2.3%) was ranked average.

Table 4.31: Influence of Curiousness to Apply the Agriculture Skills Learnt by SSAGs in Relation to Income from Poultry

Enterprise Income	Learning agriculture made me curious to apply the skills learnt			N	%
	Below Average ≤ 2	Average 3	Above Average ≥ 4		
Below average	1	30	54	85	95.6
Average	0	0	4	4	4.4

Results on income from poultry production show (95.6%) of respondents ranked below average, and (4.4%) ranked average. From the results of the study, Table 4.26 up to table 4.31 show responses from most respondents on "learning agriculture made me curious to apply the skills learnt" ranked as below average, average or above average. Income from different agricultural ventures of most respondents was ranked as below average.

HO_1: There is no statistically significant influence of perceptions developed while in school toward farming on the level of performance in farming by SSAGs

Data on this hypothesis were subjected to categorical regression analysis test to assess whether there was influence of perceptions of agriculture on the performance in farming. The results of the tests are presented in Tables 4.32 and 4.33 followed by discussions.

Table 4.32: Statistical Findings on Perceptions Developed about Farming while at School

Multiple R	R- Square	Adjusted R -Square
0.310	0.096	-0.017

Table 4.33: Coefficients on Statistical Findings on Perceptions about Farming while at School

	Standardized Coefficients		df	F	Sig.
	Beta	Std. Error			
Learning agriculture was satisfying	0.269	0.185	1	2.115	0.156
Learning agriculture was hard	-0.040	0.177	1	0.053	0.820
Learning agriculture was boring	-0.107	0.177	1	0.367	0.549
Learning agriculture made me curious to apply the skills learnt	-0.244	0.187	1	1.706	0.201

The R^2 was 0.096 meaning that, experience contributed only 9.6% of the variability in performance in farming. The F-statistics were not significant for all attitudes. The statistics are as shown in Table 4.33. The attitude "Learning agriculture was satisfying" had the highest beta coefficient of .269. "Learning agriculture was hard", "Learning agriculture was boring" and "Learning agriculture made me curious to apply the skills learnt" had negative beta values. The beta value of "Learning agriculture made me curious to apply the skills learnt" was -0.244 meaning that a change of one standard deviation in this attitude made the dependent variable to decrease by 0.244 standard deviations. For all the attitudes, the null hypothesis "Perceptions developed while in school about agriculture on the level of performance in farming by SSAGs had no significant influence on performance in farming" was accepted. Therefore, the perceptions had no influence on farming.

The findings were unexpected since it is assumed that, education in general influences learners to change attitudes towards the desired directions and therefore enable them to make informed decisions on the right career paths. This, however, concurs with [36] study on the attitude of secondary school students towards agriculture in secondary schools. His study established that there was a positive attitude among the students towards agriculture although they felt that for them to be involved in agricultural practices there was a need for land, and credit to borrow money for investment. This agrees with perceptions of farmers in the current study. Most farmers had positive attitudes towards learning secondary school agriculture. For instance, 89.9% of the farmers stated that learning agriculture was satisfying, while 57% of the farmers stated that learning agriculture was not boring at all.

5. Conclusions and Recommendations

5.1 Conclusions

With regard to objectives, hypotheses and the findings of this study, the following conclusions were drawn:

5.1.1 Secondary school agriculture graduates utilized agriculture knowledge and skills acquired in school on their farms.

5.2 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:

5.2.1 That agriculture syllabus should focus toward creation of self-employment among secondary school graduates.

5.2.2 The agriculture teachers should inculcate positive attitude to learners in order for them to appreciate farming as a business with potential employment opportunities.

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