

**THE INFLUENCE OF SELECTED FACTORS ON SECONDARY SCHOOL STUDENTS'  
ACCESS TO THE SCHOOL FARM FOR TEACHING AND LEARNING PRACTICAL  
ASPECTS OF AGRICULTURE IN MASABA NORTH SUB-COUNTY, KENYA**

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Requirements for the Award of the Degree of Master of Science in Agricultural  
Education of Egerton University**

**EGERTON UNIVERSITY**

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## DECLARATION AND RECOMMENDATION

### Declaration

This research thesis is my original work and has not been presented for award of diploma or degree in any other university.

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This research thesis has been submitted for examination with our approval as university supervisors.

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## **DEDICATION**

This paper is dedicated to my husband Lawrence Kenyatta for the great passion he has for education and my children; Whitney, Gloria and Sydney whose dreams and aspirations is to become great scholars.

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This paper is a product of my effort and meaningful contribution from many people and institutions, starting with my enrolment as an MSC student at Egerton University. While it may not be possible to individually mention all the people that in one way or another contributed to the success of this research work, I particularly wish to thank the following;

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To God be the Glory.

.

## ABSTRACT

The central aim of agricultural education at secondary school level is to train students in basic principles of agriculture and develop their skills. Although most schools offering agriculture subject have the school farm, few teachers often use supervised practical lessons. The study sought to determine; the availability of school farm, the level of secondary school students' access to the school farm, and the influence of class size and teachers' practical experience on students' access to the farm as a facility for teaching/learning practical aspect of agriculture subject in public, mixed day secondary schools in Masaba North Sub-County, Kenya. The study employed cross-sectional research design. The target population for the study comprised 6,489 agriculture students and 26 agriculture teachers (total=6,513) from 26 mixed public day secondary schools in Masaba North Sub-County. Through proportionate random sampling, 15 secondary schools were selected to represent the four educational zones in the Sub-County. The sample size for students constituted 200 respondents. In addition, one agriculture teacher was purposively selected from each of the 15 sampled schools. Data collection instrument for the study was a semi structured questionnaire. Fellow graduate student, the supervisors and research experts in the Department of Agricultural Education and Extension of Egerton University ascertained the validity of the instruments. Pilot testing on a sample of 30 respondents was carried out in mixed public secondary schools from Gucha Sub-county. Reliability of the instruments was tested using Cronbach's Alpha Coefficient and a reliability coefficient of  $\alpha=0.78$  obtained. Data collected was processed, organized and analyzed with the aid of the Statistical Package for the Social Scientists (SPSS) version 20 computer programme. The hypotheses were tested at alpha 0.05 set *a priori* using the chi-square test of independence and homogeneity. The study established there was a significant statistical association ( $p=0.007$ ) between class size and students' access to the school farm. There was also a significant association ( $p=0.027$ ) between teachers experience and students 'use of school farm as a laboratory for practical learning of agriculture. Hence, education stakeholders need to assist the public mixed schools to purchase land that is adequate for purposes of teaching, instruction and practicals. This can be done through the county government which understands the needs of each school. Teachers should be properly trained so that they have more confidence in assisting students with practicals and demonstrations in the farm. Experienced teachers can be used to expose the newly recruited and less experienced teachers to proper farm demonstrations and training skills.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

<b>BOG</b>	Board of Governors
<b>DEO</b>	District Education Officer
<b>KIE</b>	Kenya Institute of Education
<b>KCSE</b>	Kenya Certificate of Secondary Education
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>KNEC</b>	Kenya National Examination Council
<b>MDGs</b>	Millennium Development Goals
<b>MOE</b>	Ministry of Education
<b>NDPs</b>	National Development Plans
<b>PPMC</b>	Pearson Product Moment Correlation
<b>RQ</b>	Research Questions
<b>SD</b>	Standard Deviation
<b>SRM</b>	Small Rural Mission
<b>WDE</b>	World Data on Education

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

Agriculture is key to achieving the Millennium Development Goals (MDGs), since it directly influences the processes of economic growth, poverty alleviation and environmental sustainability (World Bank, 2008). According to Connie, Ahmed and William (2012) there are three long lasting objectives that have guided agricultural education and training in Africa. These are (a) to produce appropriately prepared human resources for public and private employment in agricultural activities; (b) to generate and adapt agricultural knowledge through research; and (c) to pass on this and other relevant knowledge to agricultural producers and services providers through extension and continuing education activities. The government of Kenya therefore considers agriculture to be the key to social and economic prosperity. It is the top priority in all National Development Plans (NDPs) (World Bank, 2010).

The objectives of secondary school education in Kenya are to prepare secondary school students to make a positive contribution to the development of the society and to acquire attitudes of national patriotism, self-respect, self-reliance, cooperation, adaptability and sense of purpose and self-discipline (Florina, 2013). The central aim of agriculture education at basic level is to train students in the basic principles of agriculture, provide avenues for the development of their skills and change the attitude of young children towards agriculture. Chikaire, Orusha, Okafor and Okoli (2011) while listing the basic prime movers which should work in a concerted manner to achieve sustainable agricultural development point out that one of the movers is human capital in the form of professional, managerial and technical skills produced by investment in school, agricultural colleges, faculties of agriculture and on the job training and experience. The investments in schools may be in terms of qualified teachers and availability of sufficient resources for acquisition of practical skills.

Harry and Deborah (2009) posit that in West Virginia, facilities and equipment in agriculture are moderate problems faced by beginning teachers. In Australia, 54% of teachers-in-charge of science and senior technicians rate the applied science teaching facilities at their schools as good or very good, 15% rate them as poor or very poor (Hacklay, 2009). There is a general indication from various researches that the developing economies have more challenges as

pertains to facilities in schools as opposed to developed countries which have minimal or no challenges. Despite the tremendous efforts made by Sub-Saharan governments to improve agriculture teaching, constraints still exist at basic level (Annor, Zimah & Ibrahim, 2003). Additionally, teachers often use question and answer technique and read from textbooks while students copy notes when teaching agriculture. Few teachers use supervised practical lessons in the school garden; they neither use resource people nor visit to nearby farms.

Agricultural education in Kenya's secondary education serves two fundamental objectives. First, the learners should develop basic principles of agricultural production relevant to Kenya in general, and specifically to their own environments. Secondly, learners should be involved in practical agricultural activities which aim at assisting them to acquire useful agricultural skills (Nyang'au, Kibet & Ngesa, 2011; Kilemi, 2002). Therefore, it is highly recommended that learners be involved in practical work during agriculture lessons. The school farm is used as a laboratory for teaching by demonstration of theoretical phenomenon in practical terms. With the laboratory experience, students will be able to translate what they have read in their texts to practical realities, thereby enhancing their understanding and retention of the learnt concepts (Yara, 2010).

The Agriculture Syllabus covers; crop production, livestock production, farm power and machinery, farm structures, agricultural economics and agro forestry, among others distributed throughout the four-year course in secondary school. According to Godia (2006), every school should have an operational farm whose main purpose is to reinforce teaching of agriculture. The farm should have demonstration plots, crop museum, project plot and a commercial garden farm. Schools without a school farm have several options, including: attaching themselves to neighboring farm; any agricultural institution; other school which have operational demonstration plots; use pots and boxes for growing some selected crops and embark on enterprises which do not need a lot of space.

However, in spite of these prospects, there are still challenges in accessing and utilizing these facilities by learners. Some of the challenges include; (a) inadequate facilities; (b) lack of funding; (c) high maintenance cost of facilities and equipment; (d) wide agriculture syllabus; (e) the experience of agriculture teacher; (f) the location of some facilities; (g) attitude of agriculture students; (h) class size and (i) school policy with respect to: who to manage the facility, when to allocate agriculture subject on the timetable, stroking of agriculture subject and criteria of selecting agriculture students. (Alimi, Olu & Adgbemile, 2012; Edward, 2008;

Jjembe, 2010; Milanowski & Kimball, 2005; Laiqa, Khan & Shah, 2011; Nyang'au *et al.*, 2011 Longshal & Usman, 2009; Jeff & Milenard, 2012; Monk & Schmidt, 2010)

In Masaba North Sub-County most schools have school farms. But these farms are given first priority to form four agriculture students to use them for KCSE agriculture projects. According to the Kenya national Examination Council (KNEC) (2011), the agriculture project is supposed to run from March to September of each academic year. Although Monks and Schmidt (2010) and Jeff and Milenard (2012), carried out a study on effect of class size and students' workload on assessment very little is known on the influence of the same on students' access to the school farm in Kenya. It was therefore imperative that a research be conducted to ascertain the influence of: class size and teacher's practical experience on students' access to the school farm as a facility for the teaching and learning of practical aspects of Agriculture in mixed public, day secondary schools in Masaba North-Sub County, Nyamira County-Kenya. The study's findings may assist policy makers and other stakeholders in the education sector to plan well and put in place measures to improve on students' access to teaching/learning facilities in the education systems.

## **1.2 Statement of the Problem**

Secondary school students' ability to understand, retain and apply the agricultural knowledge and skills taught is enhanced when the teaching and learning are conducted practically. Teachers can often use the school farm to conduct practical agriculture lessons and demonstrations. Although most secondary schools offering agriculture have school farms, in Masaba North Sub-County, these farms are mainly used for Kenya Certificate of Secondary Education (KCSE) agriculture project. At other levels, students are rarely exposed to practical farm activities. Past studies have dwelt on: funding; maintenance cost; inadequacy; wide agriculture syllabus; location of the facilities; school policy; and attitude of agriculture students as main factors influencing student access to learning facilities. But very little is known and documented on the influence of class size and teachers' practical experience on student access to the school farm as a teaching and learning tool in Kenya. This study sought to establish the influence of class size and teacher's practical experience on student access to the school farm as a facility for teaching and learning agriculture in Masaba North Sub-county.

### **1.3 Purpose of the Study**

The purpose of this study was to establish and document; availability of school farm as a facility for learning practical aspect of agriculture, the level of secondary school student access to the school farm and the influence of class size and teacher's practical experience on secondary school students' access to the school farm as a facility for teaching and learning practical aspects of agriculture in Masaba North Sub-County, Kenya.

### **1.4 Objectives of the Study**

The objectives of the study were to determine the:

- i. Availability of school farm as a facility for teaching/learning practical aspect of agriculture in public, mixed day secondary schools in Masaba North Sub-County,
- ii. The level of secondary school students' access to the school farm as a facility for teaching and learning agriculture in public, mixed day secondary schools in Masaba North Sub-County,
- iii. Influence of class size on students' access to the school farm as a facility for teaching/learning practical aspect of agriculture subject in public, mixed day secondary schools in Masaba North Sub-County,
- iv. Influence of teachers' practical experience on students' access to the farm as a facility for teaching/learning practical aspect of agriculture subject in public, mixed day secondary schools in Masaba North Sub-County.

### **1.5 Research Questions**

The study was guided by the following research questions.

- RQ<sub>1</sub> Is the school farm available for teaching and learning of the practical aspects of agriculture subject in mixed public and day secondary schools in Masaba North Sub-County?
- RQ<sub>2</sub> To what extent do secondary school students access the school farm as a facility for teaching and learning agriculture in mixed public and day schools in Masaba North Sub-County?



## **1.6 Hypotheses of the Study**

The following hypotheses were tested at 0.05 alpha

H<sub>01</sub> Class size has no statistically significant influence on students' access to the school farm in secondary schools in public day schools in Masaba North Sub-County

H<sub>02</sub> A teacher's practical experience has no statistically significant influence on students' access to the school farm in secondary schools in public day schools in Masaba North Sub-County.

## **1.7 Significance of the Study**

The findings of the study will provide useful information which may be used by the policy makers in the education sector especially the curriculum developers in setting criteria which may enhance students' access to agricultural education facilities in secondary schools, leading to better performance and quality agriculture graduates. The findings may also be used by the school administration through Board of Governors (BOG) to devise ways of improving students' access to facilities for learning practical aspect of agriculture. Agriculture teachers may utilize the findings to devise strategies of enhancing students' access to school farm for practical teaching and learning of agriculture thus enabling the students to be better equipped with practical skills.

## **1.8 Scope of the Study**

The study only covered mixed public day secondary schools that offer agriculture education to their students in Masaba North Sub-County and focused on availability of the school farm; level of student access to the school farm; class size and the teacher's practical experience and how they influence students' practical learning of agriculture subject. The participants in the research were; agriculture teachers and form three and four agriculture students taking agriculture in selected mixed public and day secondary schools in the Sub-county.

## **1.9 Assumptions of the study**

The study assumed that; (a) the cross sectional design used effectively gave the correct representativeness of the entire observational unit; and (b) the respondents were all literate and responded to the items appropriately.

### **1.10 Limitation of the Study**

- i) The study was restricted to the use of sample size from public, mixed and day schools whose result was to be generalized to the entire Masaba North Sub-County. This was then overcome through correct representativeness of respondents of characteristics that correspond to the entire population.
- ii) Some of the sampled schools were adamant to sacrifice their normal lessons hours for data collection. This compelled the researcher to fit in their program by rescheduling time of meeting the respondents to games time, during breaks and weekends.
- iii) Since the observation units were mainly day schools, there were incidences of absenteeism by some students who had been sampled. This was taken care of by computing a slightly higher sample size to take care of the attrition.

## 1.11 Definition of Terms

**Access:** is the ability to make use of something (Thesaurus Online Dictionary, 2010). In this study, access to school farm will refer to the percentage of practical lesson attended by students on the school farm in a year and actual utilization of the agricultural practical learning facilities thereon.

**Availability of school farm as a teaching resource:** is the characteristic of a resource that is committable, operable, or usable upon demand to perform its designated or required function. It is the aggregate of the resource's accessibility reliability maintainability serviceability and securability (Business dictionary, 2012). In this study availability refers to the existence and physical presence of the school farm, type of tenure, location of the farm, the relative size and adequacy of the school farm and availability and adequacy of farm facilities and implements/ machinery

**Class size:** is the maximum number of students legally permitted to enroll in a single class (SREB, 2012). In this study class size refers to the total number of form four students who selected agriculture as an examinable subject and actively learn the subject. Class size will be categorized into three: Small (up to 20 students), medium (21-40 students) and large (40 students and above).

**Distance of the school farm:** is the placement of planned facility with regard to other facilities according to some constraints (Biswajit, 2009). In this study location of school farm refers to the relative position of the school farm with respect to the location of the classrooms and the distance from the main school building to the farm.

**Facility:** according to Oxford Advanced Learner's Dictionary is a building, service, equipment which is provided for a particular purpose. In this study, facility will refer to the school farm and the crops and livestock on the farm.

**Level of access:** is the amount of something that exists at a particular point (Kernern English Learners Dictionary). In this study level of access refers to the frequency and extent with which students at different forms are exposed to the use of school farm in a year and actual utilization of the school farm with respect to; the existing

demonstration plots; crop museum; students' project plots in the learning of agriculture subject.

**Practical experience:** experience gained from doing a job rather than studying it (Financial Times, 2012). In this study hands-on experience refers to the number of years the agriculture teacher has taught the subject and the number of years he/she has used the school farm to carry out agronomic/livestock routine practices as well as other practical demonstrations.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

The literature review was discussed as per the objective areas under sub-headings of Physical Facilities and Classroom Instruction; Agriculture Facilities and Academic Achievement; School Farm and Practical Teaching of Agriculture; Level of Student Access to Facilities for Teaching and Learning Agriculture; Class size and Practical Teaching of Agriculture; and Teacher Practical Experience and Practical Teaching and Learning of Agriculture. The chapter also provides the theoretical framework that informs the conceptual framework, and thus ends by presenting the conceptual framework on which the study is based. The conceptual framework provides the links between the literature, the study objectives and the research questions and hypothesis.

#### 2.2 Physical Facilities and Classroom Instruction

Classroom is a place where teaching-learning take place. In this room a teacher transmits knowledge to his students. Physical facilities in a classroom are essential for effective teaching-learning process. Physical facilities affect teaching learning process directly or indirectly. Laiqa, Khan and Shah (2011) carried out a study that explored attitudes of the students towards classroom physical facilities in Higher Secondary in Pakistan. The study established that 50% of the students thought that their classrooms were spacious enough while 82% were satisfied with the quality of light in their classroom. Douglas (2010) concluded that two elements of sustainable building design, day lighting and indoor air quality, have direct effects on a student's performance. Researchers further state that better indoor air quality in schools resulted in healthier students and faculty, which in turn resulted in lower absenteeism and further improved student's achievement. The study also revealed that students performed better in daylight classrooms, whereas their ability to learn suffered when they were uncomfortable or distracted by poor conditions such as poor lighting, heating cooling and ventilation and noise

A study on the impact of classroom lighting on students' performance by Christie (2012) revealed that students attending schools that are in poor physical condition score lower on achievement tests than students in newer, functional buildings. Studies suggest that several

specific factors contribute to lower levels of student performance, including poor air quality, excessive temperatures, poor lighting, and high levels of noise. Willard (2008) provides reasons in support for the most important reasons for using color effectively in learning environment. One of these strong reasons includes that color affects a student's vigilance and the attention span, and affects the students' and teachers' perception and sense of time. Jay, Chris and Justine (2012) found that students' academic achievement improved with improved building condition. The study concluded that individual factors, such as lighting levels, air quality and temperatures and acoustics, affected students' behaviors and outcomes, although limited quantitative evidence on some of these factors existed. Seventy six percent of students thought that teacher voice was appropriate. Flexibility in classroom arrangement enables teachers to modify their classroom for creation of more conducive environment, which in turn adds to students' achievement (Bissel, 2004).

According to Earthman (2004), ethnographic and perception studies indicate that poor school facilities negatively impact on students' performance. Sixty-Five percent of students are satisfied with the seating arrangements. Although relationship between classroom conditions and students' preference and classroom conditions has been addressed, other facilities should also be integrated and the issue of access addressed.

### **2.3 The Agriculture Facilities and Academic Achievement**

The academic achievement of students is a major concern of formal education system in most countries. Resources such as finance, educational facilities, teachers and other personnel are considered crucial in facilitating the teaching process in schools. Funding of education is vital in order to provide the needed education facilities and the judicious utilization of these available facilities will lead to better standards and results. The high standard of education and high academic achievement of the students no doubt require a combination of variables such as school facilities, teacher quality, students' readiness to learn, the school climate and culture, size of classes and many other factors. These variables must be in the right quantity, quality and mix to have the desired effect.

Facilities are linking points from classroom instruction to problem solving and hands –on experience. Facilities must be furnished with equipment and modules that are highly correlated with the curriculum being implemented (Thomas, 2004). Alimi *et al.*, (2012), carried out a study to examine the relationship between education facilities, teacher

qualification, school location and academic achievement. The major objective of the study was to investigate the analysis of productivity secondary education in Ondo state with a view to suggest measures that could further increase the level of productivity of secondary schools in the state. The study revealed that Secondary Education in Ondo State was productive with input increase of 30 percent and output increase range between 39 percent and 139 percent. The study further revealed that there is a significant difference in the distribution of teachers by qualification.

Nyanga'u *et al.* (2011) carried out research on perceptions of learners towards factors influencing implementation of secondary school agriculture project in Kisii District also established that practical activities on the school farm in the course of the four years of study enables students gain experience of necessary skills to carry out agriculture projects. It is not surprising, therefore, when emphasis is being put on the importance of adequate allocation of educational resources to schools in African countries. Jjembe (2010) while trying to investigate how various aspects of funding affect the practical teaching of agriculture in selected secondary schools in Rakai district, he found out that the funds available were not adequate for agriculture practicals.

Although many researches reveal that there is a relationship between school facilities and class performance the study by Picus, Marion, Calvo and Glen (2005) found out that there was essentially no relationship between the quality of school facilities and student performance when other factors known to impact student performance were accounted for. Researchers however do not suggest that the investment in school facilities is of no importance. Edward (2008) while trying to look at the number of programs with operating greenhouse, type of operating systems, how the facilities are used in the local program and the barriers to the use of greenhouse found out that 75% of agricultural education programs in Arizona have greenhouse for classroom instruction and less likely to use it for training and agricultural science research. He also found out that most teachers have little or no post-secondary preparation or previous work experience in horticulture prior to entering teaching and are not satisfied with quantity or quality of the use of their green house. Lack of funding and experience are perceived barriers to not having a greenhouse as part of the local agriculture education programs. Although the researchers looked at green house as a facilities for teaching agriculture, little attention has be paid on availability of school farm, adequacy of the farm and the facilities thereon for effective practical teaching of agriculture.

## **2.4 The School Farm and Practical Teaching of Agriculture**

In Nigeria, Longshal and Usman (2009), attribute to low students' enrolment in agricultural sciences especially at secondary and tertiary levels of education as reflective of poor methods used in primary level where emphasis is laid on theory. They recommended teachers of agriculture to employ a more practical approach so as to stimulate the student and produce future dynamic farmers equipped with competent skills. Justine, Mark, Dawn, Kell and Pauline (2003) realized that school-age student' knowledge and understanding of various aspects of food and farming was poor. To improve the understanding of food, farming and land management amongst school-age children, they recommended school visit to school farms and the use of projects. This does not only offer a wide range of learning opportunities in the affective and cognitive domain but also provide positive outcomes for young people, as well as develop a strong community.

According to the Kenya Institute of Education (KIE) (2006) Agriculture Syllabus, for topics to do with crop and livestock production, teachers are recommended to have; (a) crop museum; (b) demonstration plots; (c) commercial plot; and (d) project plots. In addition, the school farm is also supposed to have relevant farm structures, stores and farm machinery for effective practical teaching and learning of agriculture. However it is not known or documented for the case of schools in Masaba North Sub-County, if the facilities are available and whether all the agriculture students are accessing the facilities. Study should therefore be conducted to ascertain the availability of the school farm and facilities thereon, level of access by agriculture students and influence of class size and teacher practical experience on student access to the farm.

## **2.5 Level of Student Access to the School Farm**

The actualization of the goals and objectives of education require the provision, maximum utilization and appropriate management of the facilities. Facilities management is an integral part of the overall management of the school. The school administration plays a great role in determining the nature, types and need for various facilities in schools (Ihuoma, 2008). Annor *et al* (2003) carried out study on teaching of agricultural science at the basic education level in developing countries. They found out that few teachers used supervised practicals at the school farms. Visits to nearby farms and seeking the assistance of resource people were never used. Constraints identified were related to technical aspects of agriculture, the syllabus,



teaching materials, pre-service and in-service teacher training, teacher motivation, supervision, negative attitudes of students and parents towards agriculture, teaching environment, and evaluation.

Basing on Agriculture Syllabus, learners at all levels should be involved in practicals which aim at assisting them to acquire useful agriculture skills. The syllabus clearly indicates the type of practical activity and various projects to be done at various forms as per the Table 1.

**Table 1**  
**Summary of Suggested Projects at Various levels**

<b>Form</b>	<b>Suggested projects/activity</b>
One	(a)Crop production through irrigation and (b) preparation of compost manure
Two	(a)Select and prepare planting material, preparation of a nursery bed, transplanting of crops from a nursery bed, (b) grafting on fruit trees, (c) carrying out field practices,(d) grow vegetable crops from nursery establishment to harvesting, (e) carryout disease control practices on animals and(f) identify different parasites
Three	(a) Carrying out livestock rearing practices, (b) Constructing and maintaining farm structures, (c) Carryout soil erosion control measures, (d) Design and construct a micro catchment,(e)Carry out general disease and pest control measures, (f) Raising of a maize/sorghum/millet/and bean crop from seed bed preparation to harvesting,(g)Care and use appropriate livestock handling practices
Four	Raising young stock and care and management of trees

Source; KIE Agriculture Syllabus (2006)

Although the syllabus clearly stipulates the type of activities and projects to be done, it is not well known whether all the agriculture students from Masaba North Sub-County are exposed to the practicals and suggested projects. Study hence needs to be conducted to establish the extent of exposure and the frequency of utilization of facilities by agriculture students at different forms.

## **2.6 Class Size and Practical Teaching of Agriculture**

Class size is generally regulated by the maximum number of students legally permitted to enroll in a single class (Jeff & Milenard, 2012).In their policy brief, they recommend;(a) state

to maintain smaller classes where the research shows academic benefit; (b) if class size is increased at any grade level, state should require the school to monitor individual students; (c) state leaders need to study the relationship between class size, teacher effectiveness and students performance to determine how to adjust class size and average academic gain. They also mentioned on student- teacher ratio where policy makers use the ration more to track class size and monitor trends. Orian, Valentino and Imran (2008) while carrying out a study on heterogeneous class size effects, they observed same students and faculty members exposed to a wide range of class size from less than 10 to 200. Using nonlinear class size estimate effect, they found out that;(i) at the average class size the effect was -108; (ii) the effect was negative and significant only for smaller and largest ranges of class size respectively; (iii) students at the top of the test score distribution were more affected by changes in class size, especially when class size were very large. Monks and Schmidt (2010) also found out that class size and students workload negatively impact students assessment of the courses and instructors. Large classes and heavy students load appear to prompt faculty to alter their courses in ways deleterious to students. Although there is relationship between class size and achievement, little has been done to show how class size influences students' access to facilities for teaching and learning practical aspects of Agriculture in Kenya, which this study intended to investigate.

## **2.7 Teachers' Practical Experience**

Experience matters, but more is not always better. A number of conflicting findings have emerged from the literature on teacher experience. Hanushek (1997) reviewed several hundred studies using teacher experience in production function models common to economic research, which examine the relationship between educational inputs and their contribution to educational outputs. The review revealed that teacher experience was not an important indicator of teacher quality, and therefore an unlikely contributor to student achievement. Another source of inconsistency in the empirical findings on teacher experience is the potential nonlinearity of effects. In other words, early years of teaching (i.e. up to seven years) may be associated with a gradual increase in student outcomes, middle years of eight to fourteen correspond to a weak negative effect, and then a positive effect on student achievement among teachers with 15 or more years, as found in Murnane and Phillips' study (1981).

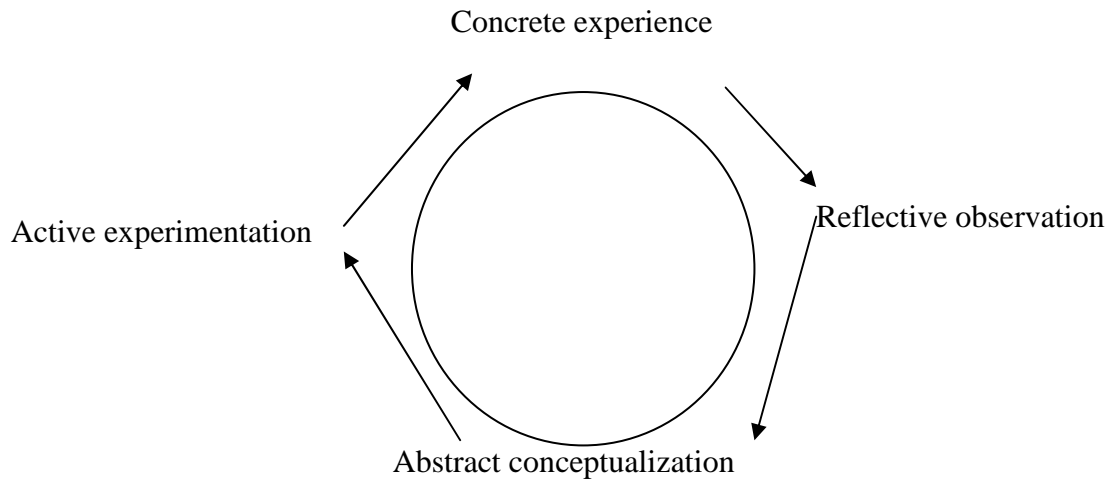
The impact of experience is strongest during the first few years of teaching, after that returns diminishes (Jennifer, 2010). A study using North Carolina high school data estimate the effect of early- career experience as 0.05 SD, with the largest effects observed for student achievement in mathematics and biology. Although it is widely accepted that teachers differ in their effectiveness empirical evidence regarding teacher differences is weak. Barbara and Larry (2004) while carrying out a research on how large are teacher effects, they discovered that effects are real and are of magnitude that is consistent with that of estimated by previous studies.

Several other researchers have conducted studies and found a relationship between teacher experience and student achievement. Ferguson and Ladd (1996) used Alabama data to examine the association between teacher experience of five or more years and student achievement in the third, fourth, eighth, and ninth grades. Findings revealed that teacher experience between beginning and up to five years had a statistically significant positive effect on math and reading achievement, whereas teachers' experience of five or more years was associated with no significant influence on reading and math scores. Another examination of teacher experience found a positive relationship between elementary student scores and teachers' experience of at least two years but no effects for additional years beyond (Grissmer, Flanagan, Kawata & Williamson, 2000). Milanowski and Kimball (2005) reported a positive relationship between teacher experience and student achievement in elementary mathematics within the first three to seven years of teaching, but no significant connection beyond that experience range. From these findings, teacher experience should be analyzed with attention to its possible nonlinear effect on students' access to practical learning facilities in agriculture. Previous studies have put a lot of emphasis on experience and performance. Research should be carried out to determine how teacher experience influence students access to facilities for teaching and learning practical aspect of agriculture

## **2.8 Theoretical Framework**

Theoretical models provide a guide for better understanding of problems facing educators. However, models must be current with reality and address the needs of teachers and students (Dyer& Osborne, 1996). Kolb's Theory of Experiential Learning (2008) will guide the study. This theory explains that experiential learning is a "holistic integrative perspective on learning that combines experience, perception, cognition and behavior" and could be applied to any educational setting. The Kolb theory has four components of the experiential learning:

concrete experience, reflective observation, abstract conceptualization and active experimentation as shown in Figure 1.



**Figure 1: Kolb's model of experiential learning cycle (Kolb, 2008)**

The concrete experience is described as “here and now experience used to validate and test abstract concept and provide a focal point for learning and a reference point for testing the implication and validity of ideas created during the learning process” (Kolb, 2007). Concrete experience allows for personal application, understanding, and meaning of abstract principles. In this model, the classroom is not a teacher centered environment; instead it is primarily student driven. The teacher is seen as an agent assisting students in education experience and making connection between prior knowledge and new learning. The reflective observation component encourages students to critically examine a concrete experience. This reflective period forces students to take responsibility for their own learning and engages the learner mentally and emotionally in the recent experience (Proudman, 1992).

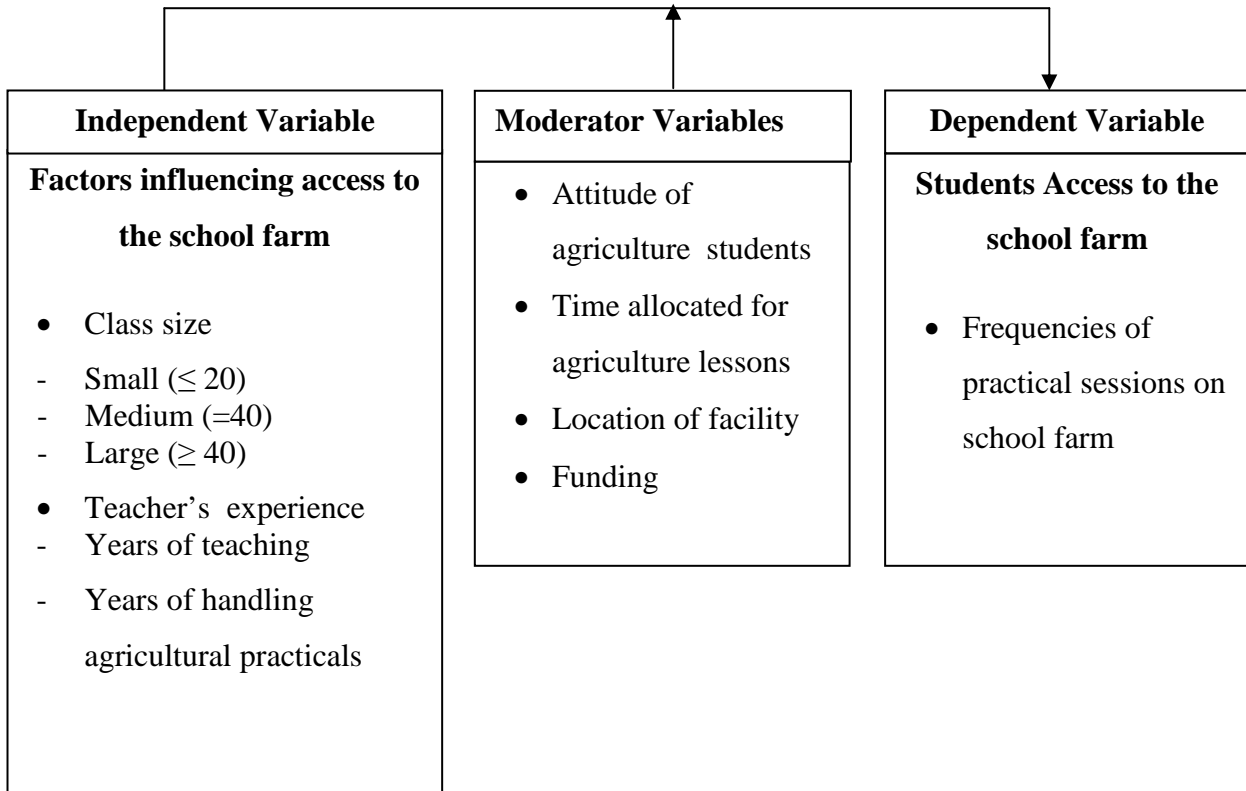
The use of abstract conceptualization allows student to make generalizations about principles related to the experience and strive for improvement. The final stage active experimentation requires the transfer and application of principles to a new situation. This theory support study in that students must be given the opportunity to apply the new knowledge and test for validity and usefulness, Teachers must therefore adequately prepare students to gain the required skills of observation, reflection, conceptualization, evaluation and experimentation that enable them to learn most effectively from their experiences.

## **2.9 Conceptual Framework**

Practical aspects of learning agriculture in secondary school mainly involve learners' ability to carry out agronomic practices; livestock routine practices; and use, care and maintenance of farm tools / equipment and farm machinery, so as to equip the learner with the necessary agricultural skills. In this study the independent variables were factors influencing access while the dependent variable was students' access to the school farm which was measured in terms of the frequency of agricultural practical sessions in a year with respect to stipulated curriculum requirement. The following factors were considered; availability of the school farm as a facility for teaching and learning agriculture and how it affects the method of teaching; the class size and how it relates to facility student ratio; the location of school farm and how it determines the frequency of visits of students and the type of activity carried out on the school farm during agriculture practical lesson; the effect of teacher hands on experience on ability/disability to carry out agronomic/livestock routine management practices. The moderator variables were; the attitude of agriculture student where a student may not like applying theory learnt in class practically; school policy which determines the type and number of facilities for teaching agriculture, maintenance cost, students' transportation cost to nearby farms, timetabling of agriculture lessons, laying modalities of selecting agriculture students. School policy may affect the availability of facilities and number of student taking agriculture in relation to available facilities. Time allocated for agriculture lessons may not be adequate to enable the agriculture teacher to expose the students to practical activities. Wide agriculture syllabus on the other hand can compel agriculture teachers to adopt a teaching method of convenience.

The moderator variables were controlled through; random sampling of schools and respondents; the use of public secondary schools and form fours and three agriculture students who had selected the subject willingly. Some aspects like school policy were included in the study. This was to ensure that the findings were purely as a result of intended variables under study.

The interrelationship between the independent, moderator and dependent variables is shown in Figure 2.



**Figure 2: Interaction between factors influencing students' access to the school farm as facility for teaching and learning practical aspects of agriculture.**

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the research design, study location, study population, sampling procedure and sample size. Also under the chapter, instrumentation, data collection, data analysis and summary of analytical procedures are described.

#### **3.2 Research Design**

The study employed across-sectional survey research design. A survey is an attempt to collect data from a “slice” of a population in order to determine the current status of that population with respect to one or more variables (Mugenda & Mugenda, 2003). A cross-sectional survey studies the relationship between different variables at one point in time (John, 2011). This survey design is chosen because the study is carried out on subjects without affecting their normal behavior, is economical and has a rapid turnaround in data collection. It also has the advantage of identifying attributes of large populations from a small group of individuals (Babbie, 1990).

#### **3.3 Location of the Study**

The study was undertaken in secondary schools in Masaba North district, Nyamira County in the former Nyanza Province of Kenya. Masaba North district was carved out of Nyamira District and borders the following districts; Masaba South and Kisii Central to the South, Nyamira to the North, Borabu to the East and Manga to the West. The district covers an approximated area of 141.5 km<sup>2</sup>. The study area was selected due to its proximity to the researcher, given also that the researcher was conversant with the terrain of the area.

#### **3.4 Target Population**

The target population refers to the entire group of individuals or objects the researchers are interested in generalizing the conclusions (Joan, 2009b). The target population for this study consisted of 6,487 agriculture students and 26 agriculture teachers (total = 6513 from all the 26 mixed public day secondary schools offering agriculture as an examinable subject in Masaba-North Sub-county).

### **3.5 Sampling Procedure and Sample Size**

The sampling unit for the study was the school. According to Mugenda and Mugenda (2003), in a descriptive research, a sample size of 10%-50% of the target population is acceptable. Therefore, through proportionate random sampling, 15 secondary schools out of the 26 mixed public secondary schools (about 50%) in Masaba North Sub-County were selected.

A sample size of 200 students was selected for the study. A sample of 200 was considered the minimum appropriate size for the study. Kathuri and Pals (1993) recommend that for a homogenous population, a sample size of 100 respondents would be appropriate provided that none of the sub-samples would be less than 20; hence a sample of 200 was double the minimum recommended sample size. Other factors that were considered in choosing the sample size were adequate representation of students from the sampled schools, resources in funds and time. In addition, 15 Agriculture teachers were purposively selected, one from each of the 15 sampled schools. Proportionate random sampling was used to select student respondents from each of the participating schools. Random sampling procedure ensures all subjects have equal chances of being selected (Joan, 2009a).

### **3.6 Instrumentation**

According to Hale (2012) survey research can apply questionnaires (structured-closed or unstructured-open) and interview schedules for data collection. Two sets of self-administered questionnaires (one set in each case for the students and agriculture teachers) were developed by the researcher and used to collect data from the study's respondents. The questionnaires were semi-structured. The teacher's questionnaire had seven main sections: the first section sought information on the respondent's profile such as age, gender, education level and teaching experience. The second section addressed issues related to the study objectives; availability of school farm, students' level of access to the school farm, influence of class size and influence of teacher practical experience on students' access to school farm. The student's questionnaire had four sections. The first section had questions that related to the respondents' profile (gender and class), while the other sections - two to four contained items that collected information on; availability of school farm, level of access and influence of class size on student access to the school farm respectively.



### **3.6.1 Validity**

Validity refers to the extent to which a test measures what it purports to measure (Martyn, 2009). For the questionnaire to accurately measure what it is supposed to measure, it must have content and face validities. The content validity of the instruments was established using a panel of peers, supervisors and research experts in Agriculture Education and Extension. They ascertained validity of the questionnaire items and gauged how well the instruments met the standards (Mugenda, 2008). The subjects were encouraged to make comments and suggestions concerning the instructions, clarity of questions asked and relevance. Their responses were used to adjust questionnaire items accordingly in improving instrument validity.

### **3.6.2 Reliability**

Reliability is the level of internal consistency or stability over time (William, 2006). Reliability has to do with the accuracy and precision of a measurement procedure (Kothari, 2004). The reliability of the questionnaire items was determined using the pilot test. Cronbach alpha provides a good measure of reliability because holding other factors constant the more similar the test content and conditions of administration are, the greater the internal consistency reliability (Chong, 2012). A pilot study on a sample of 30 agriculture students and two agriculture teachers was conducted from Gucha District where a reliability of 0.78 was obtained. The researcher therefore ensured that the instruments met the threshold for acceptable reliability of  $\alpha \geq 0.70$ .

### **3.7 Data Collection**

The key ethical consideration in the study was to obtain informed consent to carry out the study on the respondents. Other considerations for respondents were privacy and confidentiality which the researcher had to uphold during the study by ensuring that information given by the respondent was not used against the respondent. Before the administration of the questionnaires, the researcher had to seek a research permit where, a letter of approval was obtained from the Graduate School of Egerton University which was presented to the Ministry of Education, Science and Technology to obtain a research permit.

Once authority was obtained, arrangements were made to visit District Education Office of Masaba North District of Nyamira County, for permission and authority to conduct research

in the district. Copies of the consent were distributed to all school principals before commencement of the study. The school principals in the sampled school permitted and guided the researcher on how to access the agriculture teachers and agriculture students in their respective schools. To make data collection easier, faster and more efficient, the researcher explained to the respondents the necessity of conducting the research. The two sets of the questionnaire were personally administered by the researcher. The agriculture teachers' questionnaire was the first to be administered followed by the students' questionnaire.

### 3.8 Data Analysis Procedure

Based on the study objectives the researcher analyzed the data at  $p \leq 0.05$  level of significance, set *a priori*. Qualitative data was categorized into appropriate themes and checked for frequencies or percentages of responses to determine emerging trends. The collected data was also coded and entered in the computer. Data analyses were done with the aid of the Statistical Package for Social Sciences (SPSS) Version 20. Objectives one and two were analyzed using descriptive statistics and results presented in form of percentages and frequency distribution tables. Objectives three and four were translated into hypotheses  $H_{03}$  and  $H_{04}$  respectively and analyzed by use of inferential statistic (Chi-square test of independence and homogeneity). Table 2 summarizes data analysis by hypotheses.

**Table 2:**  
**Summary of Data Analysis**

<b>Hypotheses and research questions</b>	<b>Independent variable</b>	<b>Dependent variable</b>	<b>Inferential statistics</b>
<b>H<sub>01</sub></b> Class size has no statistically significant influence on students' access to the farm	<b>Class size</b> (Number of students taking agriculture)	Access to school farm (frequency of practical sessions on the school farm)	Chi square test
<b>H<sub>02</sub></b> A teacher's practical experience has no statistically significant influence on students' access to school farm	<b>Teachers' practical experience:</b> (Number of years teaching agric, Number. of years of handling agriculture practicals)	Access to school farm (frequency of practical sessions on the school farm)	Chi square test

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Introduction

In this chapter, the findings of the research study are presented and discussed. The chapter is divided into sub-sections namely: response rate, characteristics of the respondents, availability of school farm as a facility for teaching/learning practical aspect of agriculture, level of secondary school students' access to the school farm as a facility for teaching and learning agriculture, influence of class size on students' access to the school farm as a facility for teaching/learning practical aspect of agriculture subject and influence of teachers' practical experience on students' access to the farm as a facility for teaching/learning practical aspect of agriculture subject.

#### 4.2 Response Rate

All the questionnaires that were administered, that is, 200 for Agriculture students and 15 for Agriculture teachers, were successfully filled and returned. This represented a 100% response rate in each case, ensuring that the sample size remained largely as originally designed. Campion(1993)suggested that authors need to make reasonable efforts to increase questionnairereturnrates,addresstheinfluenceofnon-respondents,andthatthey do not contain any obvious biases. To increase the response rate for this study, the questionnaires were administered using the strategies described in chapter three of this study. Babbie(1990); Dillman (2000),suggest50%asthe minimal return rate; Fowler (1984)suggests60%;and De Vaus (1986), argues for 80%.Thefact that this study achieved a 100% response rate lends inherent validity and reliability to the statistical findings of the study and thus determinate generalizability to the study population as intended.

#### 4.3 Respondents' Characteristics

Under this section, the characteristics of students and teachers who participated in the study are presented.

### 4.3.1 Students Characteristics

Students' characteristics investigated were mainly gender and year of study. The sample included 200 students of which 52% were male and 48% female students. About 64% were drawn from Form three and 36% were Form four. The distribution of the student respondents by sex and year of study is as shown in Table 3.

**Table 3**

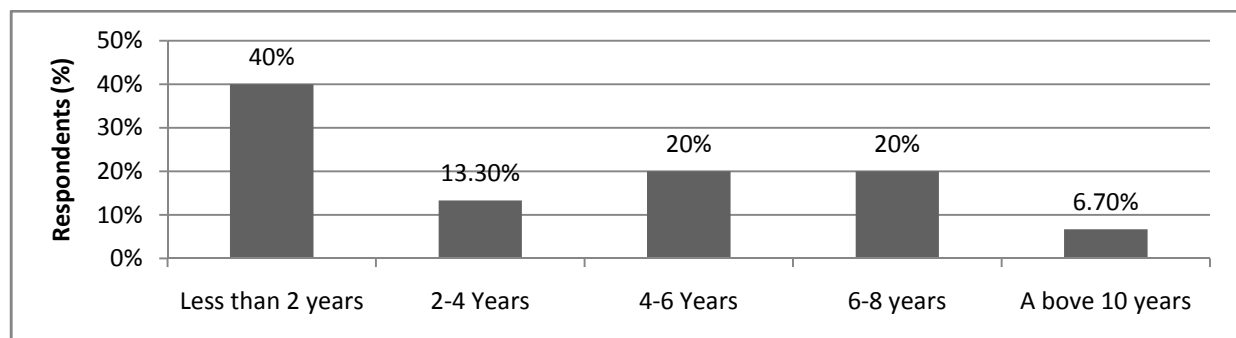
**Distribution of Student Respondents by Gender and Year of Study**

Gender of respondent	Year of study				Total	
	Form Three		Form Four		Frequency	%
	Frequency	%	Frequency	%	Frequency	%
Male	70	35	34	17	104	52
Female	58	29	38	19	96	48
<b>Average</b>	<b>128</b>	<b>64</b>	<b>72</b>	<b>36</b>	<b>200</b>	<b>100</b>

n=200

### 4.3.1 Teacher Characteristics

The teachers' characteristics investigated by this study included the terms of employment, teaching subjects and teaching experience. With regard to the terms of employment, more than half of teachers interviewed (53.3%) reported that they were employed on contractual basis while 46.7% indicated that they were permanent and pensionable teachers. Majority of the teacher respondents (60%) indicated Agriculture as their teaching subject while 40% reported other subjects other than agriculture. The percentages in Figure 3 show that the highest percentage of the teacher respondents (40%) reported to have less than 2 years of teaching experience, while those who reported the longest teaching experience of above 10 years were only 6.7%.



**Figure 3: Teaching Experience in Agriculture**

#### 4.4 Objective One: Availability of School Farm as a Teaching Resource in Secondary Schools

The first objective of the study was to determine the availability of school farm as a facility for teaching/learning practical aspects of agriculture in secondary schools in Masaba North Sub-County. Availability of the school farm was assessed in terms of the physical availability of the farm, the type of tenure, location of the farm, size and adequacy of the farm as well as the availability and adequacy of; farm machinery on the farm, field plots and livestock that were used for practical learning and teaching of Agriculture.

##### 4.4.1 Availability and Type of Tenure

The respondents were asked to indicate whether their respective schools had the school farm and the type of tenure under which the farm was operated. Table 4 shows the students' and teachers' responses on the availability of the school farm.

**Table 4:**  
**Teachers' and Students' Responses on Availability of School Farm**

School Farm Available	Students	Teachers
Yes	88%	73.3%
No	12%	26.7%
<b>Total</b>	<b>100%</b>	<b>100.0%</b>

**Teachers n=15, students n=200**

The results showed that 88% and 73.3% of students and teachers respectively reported that their respective schools had the school farm. Conversely, 12% and 26.7% of students and teachers respectively denied that their school had a farm. As relates to the type of tenure system under which the school farm was operated, 63.3% of the student respondents revealed that their schools had been given the land free of charge by the community while the 36.7% indicated that their respective schools had leased the land from the community. This finding was confirmed by the teacher respondents, 66.7% of whom agreed that the land operated by the school had been offered free of charge by the community and 33.3% indicated that the land to had been leased from the community. Bonnet *et al* (2006), in their research found that, for some schools, environmental, administration and even economics came into play, denying the schools chances of owning a school farm. This was especially so for public

schools who often had to rely on goodwill of the community to get small pieces of land for practicals and examination.

#### 4.4.2 Location of the School Farm

Location of the school farm determines the number of times the students may visit the farm during practical learning lessons as well as utilization of the farm for demonstration of the various agricultural practices, thus largely determines the availability and access to the farm. It was therefore imperative to establish the relative location of the school farm among the surveyed schools. To this end, the student respondents were asked to indicate the location of their school farm by selecting one of the three possible locations given in the Students' Questionnaire. The responses obtained were analyzed and presented in Table 5 below.

**Table 5:**  
**Location of the School Farm**

<b>Location of School Farm</b>	<b>Frequency</b>	<b>Percentage</b>
Within the school compound	128	64%
Outside the school compound but adjacent to the school	26	13%
Away from the school Compound	46	23%
<b>Total</b>	<b>200</b>	<b>100%</b>

**n=200**

Majority of the student respondents (64%) reported that their respective school farms were located within the school compound, followed by 23% who said that their respective school farms were located away from the school compound, while 13% indicated that the school farm was outside the school compound but adjacent to the school. Given that agriculture practical lessons are structured to take 80 minutes every week, locating the school farm further away from the school may limit students' access to the farm especially considering the distance to be covered to get to the farm. In this regard, the 23% of the students reporting location of the school farm away from the school farm may be disadvantaged if the distance to be covered is relatively long, which would imply that the time allocated for the practical lessons significantly limits movement. Such students would therefore have limited access to the school farm and related facilities for practical learning of agriculture.

#### 4.4.3 Size and Adequacy of the School Farm

The respondents were asked to indicate the approximate size of their respective school farms and rate the adequacy of the farm for practical use in the learning and teaching of Agriculture subject. The highest percentage of the student respondents (53.3%) observed that their school farm ranged from 1/4 to 1/2 an acre followed by 40% who reported less than 1/4 and 6.7% only who reported rated the size of their school farm to be bigger than an acre. These findings validate Alimi *et al.* (2012) findings who reported that majority of schools had farms less than 1/2 an acre. This could be attributed to lack of resources especially land as a result of high population growth.

The teachers' and students' responses on the Adequacy of the school farm were as shown in Table 6 below.

**Table 6**

#### **Teachers' and Students' Responses on the Adequacy of the School Farm**

<b>Adequacy of School Farm</b>	<b>Students</b>	<b>Teachers</b>
Adequate	39%	33.3%
Not adequate at all	61%	66.7%
<b>Total</b>	<b>100%</b>	<b>100%</b>

**Teachers (n=15), Students (n=200)**

Majority of the students and teachers (61% and 66.7% respectively) observed that the available school farm in their respective schools was not adequate at all for practical use in the learning and teaching of Agriculture. On the other hand, 39% and 33.3% of the students and teachers respectively reported that their school farm was adequate for the said purposes.

#### 4.4.4 Availability and Adequacy of Farm Facilities and Implements on School Farm

The school farm does not exist in isolation, but rather required to have various basic farm facilities and implements/machinery to practically demonstrate farming operations that largely enhances the learning of agricultural practices. Therefore, the respondents were asked to indicate whether various farm facilities, implements and machinery named were available and subsequently rate the adequacy of these implements and machinery. The teachers' and students' responses were as shown in Table 7.

**Table 7****Availability and Adequacy of Implements for Practical Learning of Agriculture**

Farm machinery	Teachers' Responses			Students' Responses		
	Not adequate/Not available	Adequate	Very adequate	Not adequate/Not available	Adequate	Very adequate
Tractor	99%	1%	-	99%	1%	-
Cart	92%	5%	3%	97%	2%	1%
Stores	90%	8%	2%	95%	4%	1%
Sprayers	90%	10%	-	98%	2%	-
Harvesting machines	97%	3%	-	95%	5%	-
Ploughs	87%	12%	1%	97%	3%	-
Harrow	82%	18%	-	98%	2%	-
Mowers	94%	6%	-	100%	-	-
Cultivators	100%	-	-	100%	-	-
Jembes	49%	36%	15%	50%	33%	17%

Summarily, the results in Table 7 show that majority of the respondents felt that the farm implements and/or machinery that the students were expected to be exposed to and use for practical purposes were either not available or inadequate. For instance, all the respondents (both teachers and students) reported that cultivators were unavailable/inadequate while over 90% in each case felt that harvesting machines, stores, sprayers, cart, tractor and mowers were largely unavailable/not adequate, the most critical being the sprayers, despite the fact that the sprayers were very important for training and ensuring productive demonstration plots. Interesting, however, is the fact that only 49% and 50% of the teacher and student respondents reported that the jembes available were not adequate. Jembes seemed to be the least of the problems faced by secondary school agriculture teachers in training students.

Eiseman and Nyamete (1990) found that jembes were a requirement for most students reporting to Kenyan secondary schools. Students reporting to secondary schools were almost always expected to do so with jembes. As such, agriculture teachers and students had more than enough jembes for use in class, for instruction and demonstration. Amudavi *et al* (2009), in their research concluded that many public schools lacked the resources to invest in farm machinery and implements. Many of the farm machineries and implements available to



secondary school agriculture students in Kenya came from well wishers and sometimes contributions of the community around. For this reason such machinery and implements were rarely enough for education and training purposes.

#### 4.4.5 Availability and Adequacy of Field Plots, Crop Museum and Farm Structures

The respondents were asked to indicate the adequacy of the demonstration plots, project plots, commercial plots, crop museums and various farm structures in their school farms. Their responses were as shown in Table 8.

**Table 8**  
**Adequacy of Demonstration, Project, Commercial Plots and Crop Museum**

Facilities	Students		Teachers	
	Adequate	Not adequate	Adequate	Not adequate
Demonstration plot	9.1%	90.9%	46.7%	53.3%
Project plot	34%	66%	66.7%	33.3%
Commercial plot	1%	99%	0%	100.0%
Crop museum	4%	96%	6.7%	93.3%

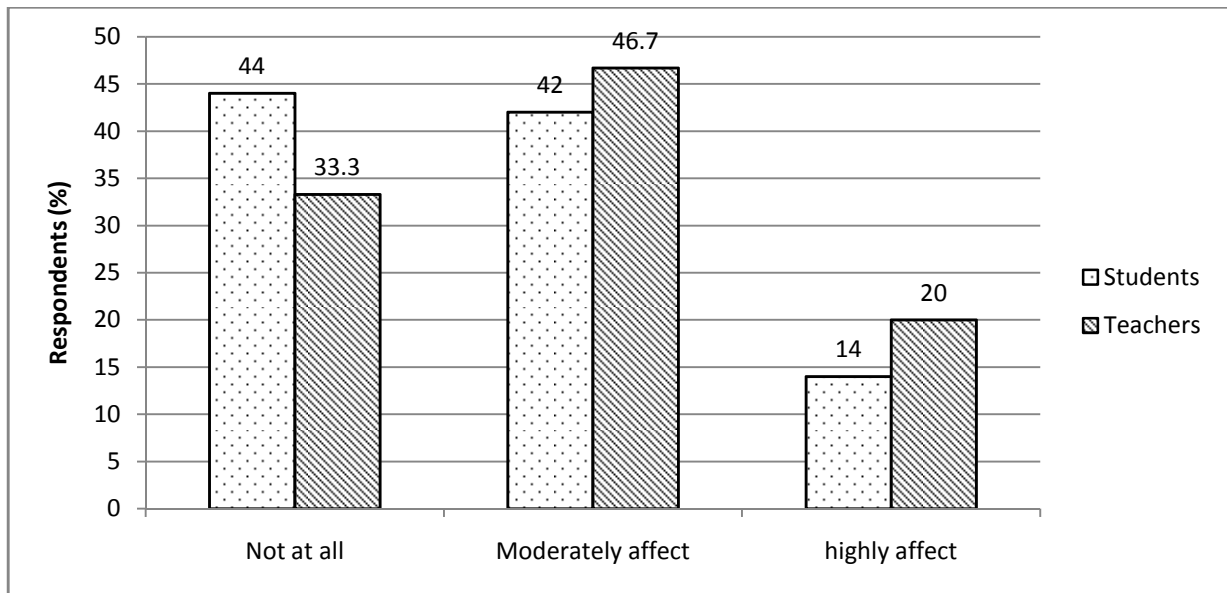
**Teachers n=15, Students n=200**

Overwhelming majority of the student respondents reported that demonstration plots (91%), commercial plots (99%) and crop museum (96%) were not adequate for practical learning and teaching of agriculture in secondary schools, and so were 53%, 100% and 93% of the teacher respondents who respectively had similar views of the respective plot facilities. On the other hand, 34% of the students compared to 66.7% of the teacher respondents observed that project plots were adequate, probably due to the fact that all form four agriculture students carry out examinable project work at the K.C.S.E level which mandates every candidate taking the subject to have access to such plots. When asked whether they had allocated agriculture students a plot on the farm other than form four KCSE project plots, 53.3% of the teacher respondents responded on the affirmative while 46.7% denied that they had allocated the students project plots. Forty percent (40%) of the teachers reported that they had never used project plots before the students commenced the KCSE agriculture project while 60% confirmed that they had used the project plots before. This finding was corroborated by students' responses where only 10% of the student respondents indicated that

they had had an opportunity to operate individual plots since joining the form one, while 90% indicated that they had never had individual plots from the onset of secondary school education.

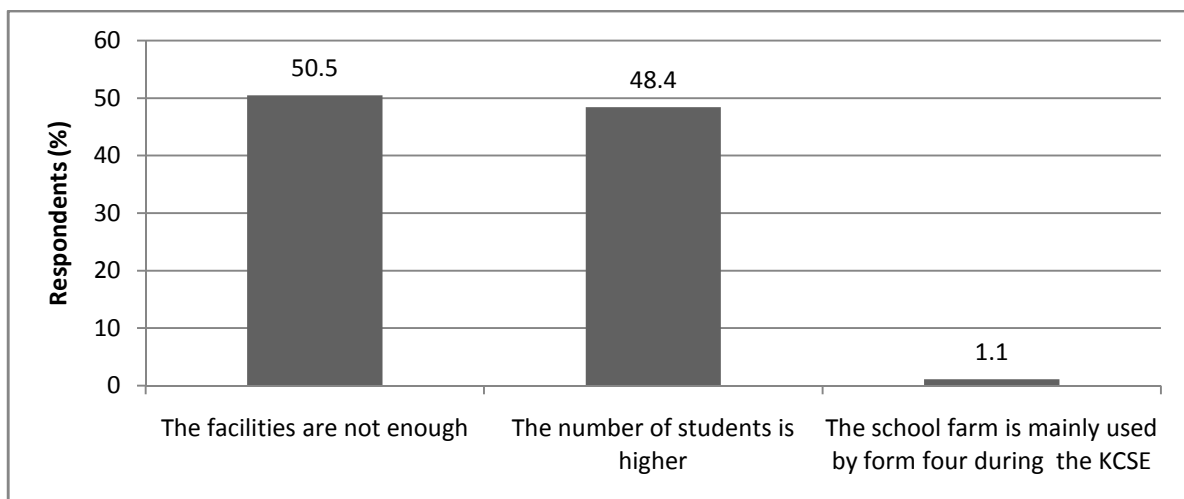
With regard to the types of farm structures found on the school farm among the mixed day secondary schools in Masaba North Sub-County, all the student respondents reported that their school farms did not have the following farm structures: dairy shed/palour; calf pen, poultry houses, rabbit hutches, piggery/pig sty, silos, zero grazing units, bee hives. Only an insignificant 3% of the student respondents reported that their schools had fish ponds on their school farm. Consequently, 4% of the students confirmed that animals were kept in their school, mainly dairy cattle. This implies that students miss out on the opportunity to get exposed to practical animal production practices due to not only absence of various categories of livestock on the farm as the Agricultural education curriculum envisages, but also due to lack of/inadequate livestock production structures that are prerequisite to livestock production. Moreover, even where the schools have some livestock as reported by the 4% of the students with dairy cattle on the school farm, it is obvious that such livestock are not raised under appropriate structures as to enable the students interact with appropriate production practices given that none of the students had reported having either zero grazing sheds or calf pens for raising dairy cattle and their calves respectively.

Class size was also noted to have effect on practical learning of agriculture where 44% of the students indicated that, class size had no effect on the utilization of school farm while the remaining 42% said that it moderately affects while only 14% indicated that that class size highly affects utilization of school farm (Figure 1). On the hand, 46.7% of teachers indicated that it moderately affects, 33.3% indicating that it doesn't affect while 20% indicated that it highly affects. Therefore, 73.3% of teachers indicated this doesn't impact the same skill to the students while only 26.7% indicated that it does. However, 82% of the respondents indicated that they often share the facilities during practical learning of agriculture while only 16% indicated that they don't share facilities.



**Figure 4: Effect of class size on the utilization of the school farm**

As indicated in Figure 2, various reasons were given for not having individual plots for carrying out projects since form one. Majority of the respondents said that the facilities were not enough, 48.4% indicated that it was due to high number of students while only 1.1% indicated that school farm was mainly used by form four students for KCSE. In addition, 87.6% of the respondents indicated that the higher number of students compared to the available facilities affected the number of times they were exposed to the facilities while only 12.4% said that it did not.



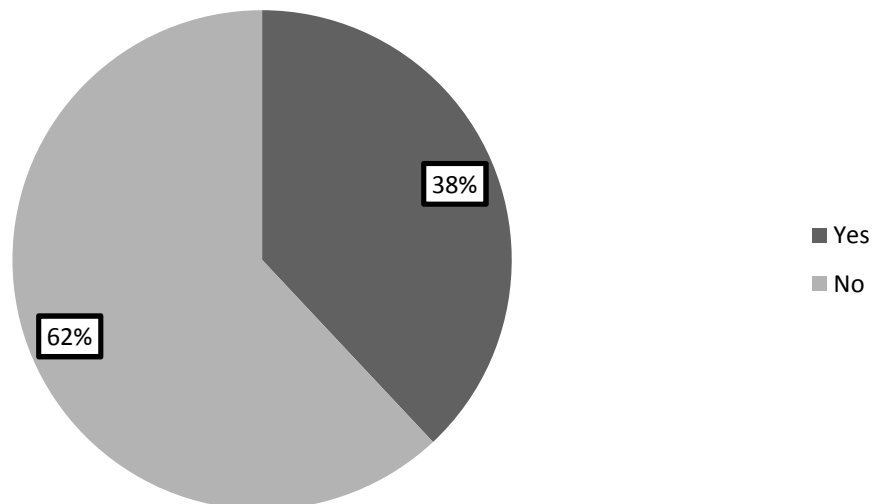
**Figure 5: Reasons for not having individual plots for carrying out project**

#### 4.5 Objective two: Level of Secondary School Students' Access to the School Farm

The presence of the school farm alone, however adequate, may not contribute significantly towards enhancing learners' agricultural (production) skills if the very learners do not have access to the farm. On the other hand, access to the school farm and its associated facilities for practical learning and teaching purposes could be limited by various factors that could be procedural and/or environmental. As such the study sought to determine if indeed the school farms and their associated facilities were accessible to the students. The level of access to the school farm in this study was assessed in terms of the students' actual use of the school farm for learning agriculture, use of the school farm for agriculture practical lessons and frequency of the practical lessons for students in each form in a year.

##### 4.5.1 Use of the School Farm for Learning Agriculture

The student respondents were asked to indicate whether they used the school farm when learning agriculture. Their responses were as shown in Figure 6.



**Figure 6: Students' Use of the School Farm for Learning Agriculture**

As shown in Figure 6 above, 62% of the student respondents reported that they did not use the school farm while learning agriculture while 38% affirmatively reported use of the school farm. For those who did not use school farm while learning agriculture, 87.9% indicated that the main reason was that it was mainly used by the form four students for KCSE projects, 7.7% indicated that they had never been allocated a plot to work on, while only 4.4% indicated that they had no idea on how to use the school farm.

#### 4.5.2 Form of Students' Use of the School Farm

The students were asked to indicate how they had been using the school farm. Their responses were as shown in Table 9 below.

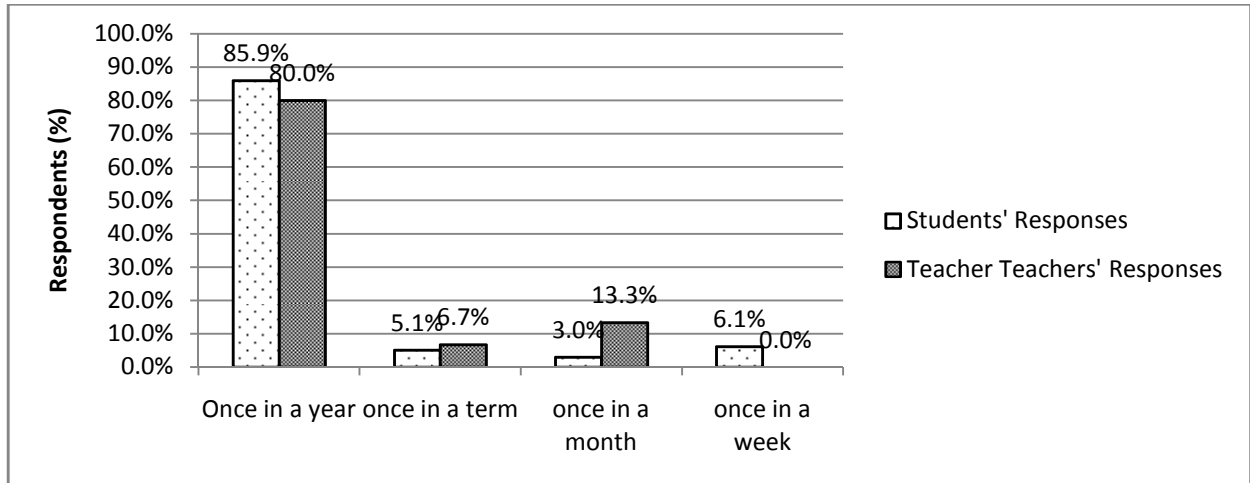
**Table 9**  
**Students' Use of the School Farm**

<b>Form of Students' Use of the School Farm</b>	<b>Frequency</b>	<b>Percentage</b>
During agriculture practical lessons	72	36.0
For carrying out individually assigned projects	22	11.0
I have never used the school farm	74	37.0
I have only been assigned a plot in form four	32	16.0
<b>Total</b>	<b>200</b>	<b>100.0</b>

The percentages in the table indicate that 37% of the student respondents had never used the school farm while 36% used the school farm during agriculture practical lessons. The lowest percentage (11%) indicated that they used the school farm for carrying out individually assigned projects compared to 16% who indicated that they had only been assigned a plot in form four.

#### 4.5.3 Students' Frequency of Use of the School Farm for Agriculture Practical Lessons

The study sought to establish the frequency with which the students visited the school farm for agriculture practical lessons, other than attending to KCSE projects. Majority of the students (86%) visited the school farm for practical agriculture lessons once in a year. Only a few of the students had an opportunity to visit the school farm once in a week (6%) for agriculture lessons as required by the secondary school agricultural education curriculum, while as less as 5% and 3% respectively only visited the school farm once in a term and once in a week. Similar results were obtained from the analysis of teachers' responses where 80% of the teachers reported to have visited the school farm once in a year other than to guide the students for KCSE agriculture project followed by 13.3% who indicated that they visited the farm once a month and 5.1% who visited the farm once in a term. The findings were as shown in Figure 7.

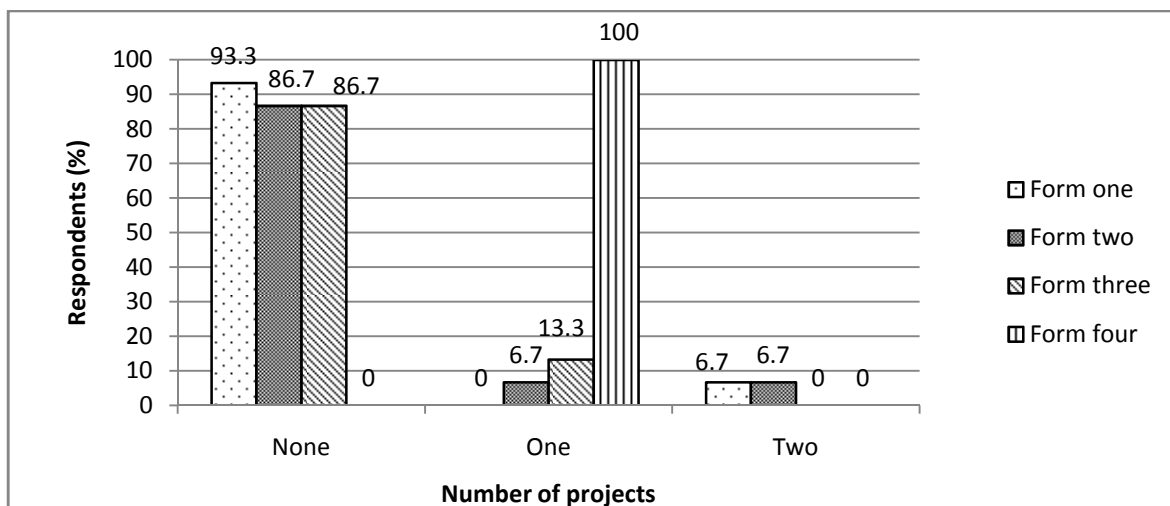


**Figure 7: Students' Frequency of Use of the School Farm for Agriculture Practical Lessons**

Further analysis revealed that the form four students used the school farm more frequently (49%) compared to 2% for forms one and two and 1% of the form three students who used the school farm frequently.

#### 4.5.4 Number of Projects Carried Out by Students at Each Level

The study sought to establish the number of projects carried out by the students, whether individually or in groups from form one to form four. The findings were as shown in Figure 8.



**Figure 8: Number of Projects Carried out by Students at Each Level**

Number of projects varied across the levels with majority of teachers reporting to have done no project from forms one to three. All the teachers reported that they had only handled one

project with the form four students, which could well be concluded to be the examinable KCSE project. On the other hand, 93.3% of the teachers reported that they didn't take all the students to learn agronomic practices on commercial plots while only 6.7% reported that they took all the students. Generally, the analysis revealed that forms one, two and three students were least exposed to the school farm and related facilities while those who highly exposed were from four students.

#### **4.6 Objective three: Influence of Class Size on Students' Access to the School Farm**

The third objective of the study was to determine the influence of class size on students' access to the school farm as a facility for teaching/learning practical aspect of agriculture subject in public, mixed day secondary schools in Masaba North Sub-County. To analyze the influence of class size on students' access to the school farm, the objective was translated into the following null hypothesis: Class size has no statistically significant influence on students' access to school the farm in secondary schools in public day schools in Masaba North Sub-County. This section therefore presents the findings on the average class size and analyzes the influence of the class size on students' access to the school farm as a facility for teaching/learning practical aspects of agriculture subject by testing the null hypothesis.

##### **4.6.1 Class Size**

The class size was operationalized as the number of students taking agriculture subject in forms one to form four of secondary school curriculum. The teacher respondents from each sampled school were asked to indicate the number of students taking agriculture subject in each form. Table 10 summarizes the average number of agriculture students per form in Masaba North Sub-County.

**Table 10**  
**Class Size and Form**

<b>Form</b>	<b>Average number of Agriculture Students</b>
Form one	69
Form two	60
Form three	24
Form four	23

The results in the table show that form one had the highest average number of agriculture students as 69 and the averages progressively decreased towards form four, with an average of 23 in the final year. As the students advance in class, the number of students taking agriculture in a class decreases. During the lower levels all students within the public schools are expected to take agriculture as a subject. This means that the numbers of students agriculture teachers are expected to deal with are quite large. However, as they advance into senior classes, agriculture becomes an elective subject and as some students select other subjects clustered with agriculture, the number of students taking agriculture decreases by more than half, that is from an average of 60 in form two down to an average of 24 in form three. The number of students remains almost stagnant in form four and three because there are rarely any changes in subjects' intake at the senior levels

#### **4.6.2 Class Size and Access to School Farm**

To analyze the influence of class size on students' access to the school farm as a facility for learning practical aspects of agriculture subject, an index for level of access to the school farm constituting use of school farm for learning agriculture, frequency of the use of school farm for agriculture practical lessons and number of projects carried out by students at each level was adopted. In constructing the index, a scoring strategy was adopted where a score of 1 was adopted for a "Yes" response and 0 for a "No" response.

With regard to frequency of visiting the school farm for practical lessons, a score of 4 was adopted for "once in a week", 3 for "once in a month", 2 for "once in a term" and 1 for "once in a year. The number of projects carried out by the students was adopted as a score in its entirety. Individual scores from the three items were cumulated to obtain a total score for the index and average scores calculated by dividing the total scores by the number of items (3). The average scores ranged from 0.83 to 5.17.

For descriptive analysis, the average scores were categorized as follows: 0.83 – 2.28 (Low access), 2.29 – 3.73 (Average) and 3.74 – 5.17 (High access) and cross-tabulated with class size to determine the influence of class size on students' access to the school farm as a facility for learning practical aspects of agriculture, while the average scores were used for further correlation analysis. The findings indicate that on average, 62% of agriculture students had low access to the school farm. Only 13% of the agriculture students had high access to the school farm, while 25% had average access. Among the schools with agriculture



classes of less than 20 agriculture students, the highest percentage (42.9%) had high access to the school farm for practical learning of agriculture compared to 28.6% in each case with average and low access to the school farm. Class size of 31- 40 agriculture students had the highest percentage of those with low access to the school farm (84.6%) and yet the lowest percentage of those with high access to the school farm (7.7%). Comparatively, agriculture classes with over 41 students had more students with average access to the school farm as opposed to the other class-sizes.

Form four agriculture students who, on the contrary exhibited higher percentages with high access to the farm across the class sizes except for the class size below 20 students. This differential level is attributable to the KCSE agriculture project that demands high levels of attendance by the form four candidates, thus the need to be on the school farm regularly. The results of the cross tabulation were as shown in Table 11.

**Table 11**  
**Class Size and Access to School Farm**

Class Size	Access			Total
	Low	Average	High	
Below 20 students	28.6%	28.6%	42.9%	100.0%
21-30 students	62.5%	25.0%	12.5%	100.0%
31-40 students	84.6%	7.7%	7.7%	100.0%
41 and above students	51.4%	37.1%	11.4%	100.0%
<b>Averages</b>	<b>62.0%</b>	<b>25.0%</b>	<b>13.0%</b>	<b>100.0%</b>

#### 4.6.3 Hypothesis (H<sub>01</sub>) Testing

Class size has no statistically significant influence on students' access to the school farm in secondary schools in public day schools in Masaba North Sub-County. Chi-square test was used to establish whether there was a relationship between class size and students' access to the school farm as a facility for learning and teaching of agriculture subject. There was a statistically significant relationship ( $p=0.007$ ) between class size and utilization of the school farm (Table 12). Majority of the students who reported that it moderately affects was where the class size was above 31. Chi-square analysis also revealed that there was significant relationship ( $p=0.05$ ) between class size and sharing of the school farm facilities (Table 13). There was also a significant relationship ( $p=0.021$ ) between class size and plot allocation

with the allocation decreasing with the increase in class size (Table 14). Significant relationship ( $p=0.000$ ) was observed between class size and the use of school farm when learning agriculture with the increase in class size resulting to reduction in learning of students in school farm (Table 15).

**Table 12**  
**Influence Class Size and Utilization of School Farm**

How many student are taking agriculture in your class	Does your class size affect the utilization of the school farm?			Total
	Not at all	Moderately affect	highly affects	
below 20	7	0	0	7
21-30	18	9	5	32
31-40	9	15	2	26
40 and above	10	18	7	35
<b>Total</b>	<b>44</b>	<b>42</b>	<b>14</b>	<b>100</b>

**n=100 Chi-square = 17.85 df=6 p-value= 0.007the result is significant at  $p\leq 0.05$ ,**

**Table 13**  
**Influence of Size and Sharing of Agriculture Facilities**

How many student are taking agriculture in your class	At any given time do you normally share some of the agriculture facilities?		Total
	Yes	No	
below 20	7	0	7
21-30	26	6	32
31-40	17	9	26
40 and above	33	2	35
<b>Total</b>	<b>83</b>	<b>17</b>	<b>100</b>

**n=100 Chi-square = 12.60 df=6 p-value= 0.05the result is significant at  $p\leq 0.05$ ,**

**Table 14**  
**Influence of Class Size and School Farm Plot Allocation**

How many student are taking agriculture in your class	Do you have individual plot for carrying out project since form one		Total
	Yes	No	
below 20	0	7	7
21-30	7	25	32
31-40	3	23	26
40 and above	0	35	35
<b>Total</b>	<b>10</b>	<b>90</b>	<b>100</b>

**n=100 Chi-square = 9.75 df=6 p-value= 0.021the result is significant at  $p\leq 0.05$ ,**

**Table 15****Influence of Class Size and Use of School Farm For Practical Learning of Agriculture**

How many student are taking agriculture in your class	Do you normally use the school farm when learning agriculture?		Total
	Yes	No	
below 20	1	6	7
21-30	13	19	32
31-40	21	5	26
41 and above	3	32	35
<b>Total</b>	<b>38</b>	<b>62</b>	<b>100</b>

**n=100 Chi-square = 43.991 df=6 p-value= 0.000, the result is significant at  $p \leq 0.05$**

The results revealed that there is a relationship between class size and students level of access to the school farm. The p-values obtained for the relationship were less than 0.05 prior set for test of the significance.

Based on the foregoing findings, the study rejects the null Hypothesis,  $H_{01}$ : Class size has no statistically significant influence on students' access to school the farm in secondary schools in public day schools in Masaba North Sub-County. Eiseman (2004) found that many schools denied access to the school farm for other classes, in favor of the form four candidates. This is due to the fact that the form four students are a priority in terms of access to the school farm for purposes of demonstration and attendance to the form KSCE agriculture project exam, which makes it imperative for all the form four agriculture candidates to access the school farm. In fact this was especially so for schools with a high number of candidates undertaking agriculture.

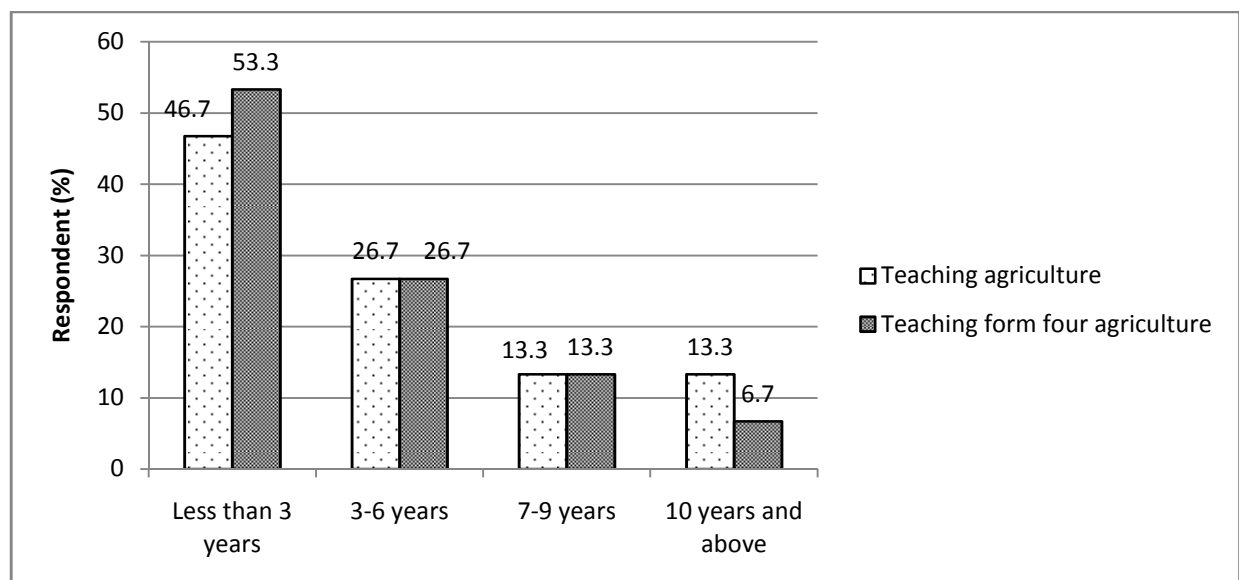
#### **4.7 Objective Four: Teachers' Experience and Students' Access to the School Farm**

The final objective of this study was to determine the influence of teachers' practical experience on students' access to the farm as a facility for teaching/learning practical aspect of agriculture subject in public, mixed day secondary schools in Masaba North Sub-County. To analyze the influence teacher practical experience on students' access to the school farm, the objective was translated into the following null hypothesis: a teacher's practical experience has no statistical significant influence on students' access to school the farm in secondary schools in public day schools in Masaba North Sub-County. This section therefore presents the findings on teacher experience and analyzes the influence of teacher experience

on students' access to the school farm as a facility for teaching/learning practical aspects of agriculture subject by testing the null hypothesis.

#### 4.7.1 Teacher Experience

Majority of the agriculture teachers (46.7%) had less than three years, followed by 26.7% who had between 3 and 6 years, then 13.3% that indicated between 7 and 9 years and 10 years and above each. In addition, 53.3% indicated that they had taught form four for less than three years followed by 26.7% that indicated between 3 and 6 years, then 13.3% that indicated between 7 and 9 years and lastly 6.7% that said that they have taught form four for 10 years and above (Figure 9). Basing on the use of the tractor and its parts, 93.3% of the teachers indicated that they had never used a tractor, parts of the tractor as a teaching resource, crop museum, and livestock while only 6.7% have had less than 2 years' experience. All the teachers interviewed indicated that they had never used demonstration plots as a teaching resource. When asked on how often they took agriculture students to the farm, 53.3% indicated once a month, followed by 20% who indicated once a week and never in each case, then 6.7% that indicated once a term. When teaching farm power and machinery, all the teachers indicated that they rarely use tractor and its parts. The major challenge indicated by teachers in the practical learning of agriculture was inadequate resources.



**Figure 9: Teaching experience of agriculture teachers**

**Table 16****Influence of Agriculture Teachers Experience on Use of School Farm**

For how long have you been teaching agriculture in secondary school	Do you use the school farm as a laboratory for the practical teaching of agriculture?		Total
	Yes	No	
Less than 2 years	1	5	6
2-4 Years	0	2	2
4-6 Years	3	0	3
6-8 years	1	2	3
Above 10 years	0	1	1
<b>Total</b>	<b>5</b>	<b>10</b>	<b>15</b>

**n=15 Chi-square = 10.97 df=4 p-value= 0.027, the result is significant at  $p \leq 0.05$**

**4.6.2 Hypothesis (Ho<sub>2</sub>) Testing**

Objective IV was translated into the following null hypothesis: teacher experience has no statistically significant influence on students' access to school the farm in public day secondary schools in Masaba North Sub-County. Chi-square test was conducted to establish whether there was a relationship between teacher experience and students' access to the school farm as a facility for learning and teaching of agriculture subject. The results are given in Table in 16. A p-value of 0.027 for the relationship between teacher experience and access to the farm was obtained which is less than 0.05 set *a priori* for the test of the significance. There is hence a relationship between teacher experience and its effect on the students' utilization of the school farm. Based on the foregoing findings, the study rejects the null Hypothesis. This is to mean that the longer the teachers experience (that is an increase in the number of years of teaching Agriculture); the more the students had access to practicals and demonstrations in the farm.

Malinowski and Kimball (2005) stated that the more a teachers' experience in teaching the practical subjects such as agriculture, the more they relied on demonstrations and practicals. Experienced teachers understood the benefits of practical work and demonstration, while less experienced teachers preferred classroom work, rather than practical work. In addition,

Nyangau *et al* (2011) posit that less experienced teachers were often left to deal with the lower classes (form one and two), who had less access to the farm. More experienced teachers were often given the responsibility of the senior classes, who were given more and more time in the farms for purposes of individual examination projects.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.1 Introduction

This chapter presents a summary of the key findings, draws conclusion from the findings and makes recommendations based on the conclusion

#### 5.2 Summary of the Results

The study revealed that most of the schools had less than half an acre of land for practical learning of agriculture and there were no adequate facilities on the farm to all agriculture students that could enhance practical teaching of agriculture. The level of student access to both the school farm and facilities thereon was very low, nearly all the schools had allocated the available school farm to form agriculture student's fours for the purpose of KNEC projects, while other students were rarely exposed to projects or practical learning of agriculture. In addition the results also revealed that large numbers of agriculture students in form 1 and 2 led to high student facility ratio hence inability to expose the students to practical approach of learning of agriculture. Lastly, majority of agriculture teachers were not permanently employed and furthermore, they had less than three years experience of teaching agriculture as an examinable subject.

#### 5.3 Conclusions

Based on results the researcher concluded that:

- i. Most school farms in most public, mixed day secondary schools in Masaba North Sub-County lacked adequate facilities to facilitate student' exposure to practical learning of agriculture
- ii. The level of secondary school students' access to the school farm as a facility for teaching and learning agriculture in public, mixed day secondary schools in Masaba North Sub-County was very low and only Form 4 students were given preference because of the compulsory KCSE Agriculture project.

- iii. Class size has an influence on students' access to the school farm as a facility for teaching/learning practical aspect of agriculture subject in public, mixed day secondary schools in Masaba North Sub-County,
- iv. Teachers' practical experience has an influence on students' access to the farm as a facility for teaching/learning practical aspects of agriculture subject in public, mixed day secondary schools in Masaba North Sub-County.

#### **5.4 Recommendations**

- i. Education stakeholders need should assist the public mixed schools to purchase adequate land for purposes of teaching, instruction and practicals. They can do this through the county government which understands the needs of each school.
- ii. The government should devise a project assessment procedure that would compel agriculture students to implement agricultural projects at various levels. This would increase the level of students' utilization of the school farm, hence equipping the student with relevant practical skills.
- iii. The size of the school farm should be considered when admitting new students to ensure that each student has access to the farm for practical learning of agriculture.
- iv. The government should develop a policy that ensures that all newly recruited teachers attend hands on in-service training as a way of equipping them with practical skills in agriculture. Experienced teachers can be used to expose the newly recruited and less experienced teachers to proper farm demonstration and training skills.

#### **5.5 Suggestions Further Studies**

Based on the findings, the researcher recommends that study be conducted on;

- i. Challenges experienced by newly recruited teachers on practical teaching of agriculture



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## APPENDICES

### Appendix A: Agriculture Students' Questionnaire

#### INTRODUCTION

Dear Respondent,

I am a post-graduate student of Egerton University, currently conducting a research on the **Factors affecting secondary school students' access to facilities for teaching and learning practical aspect of agriculture in Masaba North district Kenya**

The information generated from this study may assist the government to review the policy and device on the best means of enabling teachers equip agriculture students with practical skills.

You have been selected to assist in providing the required information, as your views are considered important to this study.

I am therefore kindly requesting you to fill this questionnaire. Please note that any information you give will be treated with utmost confidentiality and will only be used for the purposes of this study.

Thank you.

EVELIA JOSEPHINE

#### **Instructions:**

Please fill in the blanks or tick (✓) to provide the information requested for on the spaces provided. You are not required to fill in your names.

#### **Background information**

1. Kindly indicate your gender

Male

Female

2. kindly indicate your year of study

Form three

Form four

**SECTION A: AVAILABILTY OF SCHOOL FARM**

1. Does your school have a farm?
  - € Yes
  - € No
  
2. If your answer is yes, under what tenure system does the school operate the farm?
  - € Offered free of charge from the community (member)
  - € Hired on an annual basis
  - € Leased
  
3. If no, do you have an alternative farm for your agriculture projects?
  - € Yes
  - € No
  
4. How adequate is the farm you use for practical learning of agriculture?
  - € Not adequate at all
  - € Adequate
  
5. Does the school farm have facilities for teaching and learning agriculture
  - € Yes
  - € No
  
6. If yes tick the facilities that you have on your school farm
  - Farm machinery
  - Stores
  - Demonstration plots
  - Project plots
  - Commercial plots
  - Crop museum
  - Farm structures
  
7. For farm machinery, tick whether the implement is Adequate or inadequate.

<b>Implement</b>	<b>Adequate</b>	<b>Inadequate</b>
Disc plough		
Disc harrows		
Spike toothed harrows		

<b>Implement</b>	<b>Adequate</b>	<b>Inadequate</b>
Spring tined		
Sub- soilers		
Ridgers		
Rotary tillers		
Mowers		
Cultivators		
Sprayers		
Harvesting machines		
Shellers		

8. The school farm has different types of stores. Tick() all that apply.  Feed  Farm produce  Chemical  Tools None
9. For demonstration plots, project plot, commercial plot and crop museum, indicate whether they are Adequate or Inadequate

<b>Plots</b>	<b>Adequate</b>	<b>Inadequate</b>
Demonstration plot		
Project plot		
Commercial plot		
Crop museum		

10. Tick on the type of structures found on your school farm  Crushes Dips  Spray race Dairy shed/Palour  Calf pen  Poultry houses  Rabbit hutches Piggery/Pig sty Fish pond Silos Zero grazing unit  Bee hives None

11. Do you have a tractor?

Yes

No

12. If yes, how adequate is the tractor and its parts to provide enough learning opportunities for your class?

€ Not adequate at all

€ Somehow adequate

€ Adequate



€ Very adequate

13. Do you rear animals in your school farm?

Yes

No

14. If yes tick the category of animals reared on your school farm.  Dairy cows

Beef animals  Poultry  Fish  Camel  Donkeys

## **SECTION B: CLASS SIZE AND STUDENT ACCESS TO SCHOOL FARM**

15. How many students take agriculture in your class?

€ Below 20

€ 21-30

€ 31-40

€ 41 and above

16. Does your class size affect the utilization of the school farm?

€ Not at all

€ Somehow affects

€ Moderately affects

€ Highly affects

17. At any given time do you normally share some of the agriculture facilities

Yes

No

18. Do you have individual plots for carrying out projects since Form one?

Yes

No

19. If No, why? Tick the most appropriate

The facilities are not enough

The number of student is higher compared to the available facilities

20. If the number of students is higher compared to the available facilities, does it affect the number of times you are exposed to the facilities?

Yes

No

### **SECTION C: LEVEL OF STUDENT ACCESS TO THE SCHOOL FARM**

21. Where is your school farm located

€ Within the school compound

€ Outside the school compound but adjacent to the school

€ Away from the school Compound

22. Do you normally use the school farm when learning agriculture?

No

Yes

23. If No, why?

I have never been allocated a plot to work on

I have no idea on how to use the school farm

The school farm is mainly used by form four during the KCSE project

24. If yes how often do you use the school farm?

Once in a year

Once in a term

Once in a month

Once in a week

25. In which form have you used the school farm frequently for the years you have been learning agriculture?

Form one

Form two

Form three

Form four

None of the forms

26. How have you been using the school farm?

During agriculture practical lessons

For carrying out individual assigned projects

27. If you have been carrying out individual or group projects, indicate the total number of projects you carried out while in: Form one  Form two  Form three  Form four

28. Kindly list the types of projects you carried out while in form one, two three and four

respectively.

Form	Type of project done
One	
Two	
Three	
Four	

29. Other than attending to your KNEC project, how often do you visit your school farm for other practical lessons?

- Never
- Once in a term
- Once in a month
- Once in a week

30. Have you ever been allocated a plot on the farm other than the form four KNEC project plot?

- Yes
- No

31. Before starting your Form Four KNEC project, had you used the farm before?

- Yes
- No

32. If yes, how often did you use the farm?

- Never
- Rarely
- Frequently

33. How do you use your school farm?

- For demonstration
- As a commercial plot
- For KCSE project
- As a crop museum

34. As a commercial plot, tick the projects that are initiated on the plot

- Crop production
- Livestock rearing
- Fish farming
- Bee keeping

Thank you for responding to the questions.

## Appendix B: Agriculture Teachers' Questionnaire

### INTRODUCTION:

**Dear Respondent,**

I am a post-graduate student of Egerton University, currently conducting a research on the **The influence of selected factors affecting secondary school students' access to the school farm as a facility for teaching and learning practical aspect of agriculture in Masaba North district Kenya.**

The information generated from this study may assist the government to review the policy and device on the best means that will enable teachers to equip agriculture students with practical skills.

You have been selected to assist in providing the required information, as your views are considered important to this study.

I am therefore kindly requesting you to fill this questionnaire. Please note that any information you give will be treated with utmost confidentiality and will only be used for the purposes of this study.

Thank you.

EVELIA JOSEPHINE

### **Instructions:**

Please fill in the blanks or tick (✓) to provide the information requested for on the spaces provided. You are not required to fill in your names.

### **Background information**

1. Kindly indicate your terms of employment

€ Permanent and pensionable

€ Contract

2. kindly indicate your teaching subject/ subjects

.....

.....

3. For how long have you been teaching agriculture in secondary school?

.....

**SECTION A: AVAILABILITY OF SCHOOL FARM**

4. Does your school have a farm?
  - € Yes
  - € No
5. If yes what is the actual size of the school farm\_\_\_\_\_
6. If no, do you have an alternative farm for your agriculture projects?
  - € Yes
  - € No
7. If your answer is yes, under what tenure system does the school operate the farm?
  - € Offered free of charge from the community (member)
  - € Hired on an annual basis
  - € Leased
  - € Rent paid on a monthly basis
8. How adequate is the farm you use for agricultural teaching/learning activities?
  - € Not adequate at all
  - € Somehow adequate
  - € Adequate
  - € Very adequate
9. Does the school farm have enough facilities for teaching agriculture?
  - € Yes
  - € No
10. If yes, tick the facilities available on the school farm that enhance effective teaching of agriculture
  - Farm machinery
  - Stores
  - Demonstration plots
  - Project plots
  - Commercial plots
  - Crop museum
  - Farm structures
11. For farm machinery, tick whether the implement is Adequate or inadequate.

<b>Implement</b>	<b>Adequate</b>	<b>Inadequate</b>
Disc plough		

<b>Implement</b>	<b>Adequate</b>	<b>Inadequate</b>
Disc harrows		
Spike toothed harrows		
Spring tined		
Sub- soilers		
Ridgers		
Rotary tillers		
Mowers		
Cultivators		
Sprayers		
Harvesting machines		
Shellers		

12. Which types of stores are found on your school farm? Feed Farm produce  
 Chemical Tools

13. If your school has the following facilities; demonstration plots, project plot, commercial plot and crop museum, indicate whether they are Very Adequate, Adequate, Inadequate on Very Inadequate.

<b>Plots</b>	<b>Very Adequate</b>	<b>Adequate</b>	<b>Inadequate</b>	<b>Very Inadequate</b>
Demonstration plot				
Project plot				
Commercial plot				
Crop museum				

14. Tick on the type of structures found on your school farm  Crushes  Dips  Spray race  Dairy shed/Palour  Calf pen Poultry houses  Rabbit hutches  Piggery/Pig sty  Fish pond Silos Zero grazing unit Bee hives

15. Does your school have a tractor?  
Yes  
No

16. If yes, how adequate is the tractor and its parts to provide enough learning opportunities for your class?

- Not adequate at all
- Somehow adequate
- Adequate
- Very adequate

17. Do you rear animals in your school farm?

- Yes
- No

18. If yes tick the category of animals reared on your school farm.  Dairy cows

- Beef animals  Poultry  Fish  Camel  Donkeys

19. Are there challenges in the use of the school farm as a teaching facility?

- Yes
- No

20. If yes, kindly give some of the challenges you face as an agriculture teacher in the effective use of school farm as a facility for teaching and learning practical aspect of agriculture

.....  
.....

**SECTION B: LEVEL OF ACCESS TO THE SCHOOL FARM.**

21. Do you use the school farm as a laboratory for the practical teaching of agriculture?

- Yes
- No

22. Do you expose all the agriculture student to the school farm and facilities thereon for practical learning of agriculture?

- Yes
- No

23. Is the school farm adequate enough to enable you carry out form four KCSE agriculture project as well as other project and activities for continuing students?

- Yes
- No

24. If No, tick in ascending order the class that is more exposed to the school farm and the facilities. ( 1-most exposed 4-the least exposed)

Form	1-Highly exposed	2-Moderately exposed	3-lowly exposed	4-least exposed
Form one				
Form two				
Form three				
Form four				

25. Why is the frequency of exposure differing at various levels

- The facilities are not adequate to enable access of all student
- The students are many
- Form four students are given the first priority to use the school farm during the KCSE project

26. Other than attending to your KNEC project, how often do you visit your school farm for other practical lessons?

- € Never
- € Once in a term
- € Once in a month
- € Once in a week

27. Have you ever allocated agriculture students a plot on the farm other than the form four KNEC project plot?

- € Yes
- € No

28. Before starting your Form Four KNEC project, had you used the farm before?

- € Yes
- € No

29. If yes, how often did you use the farm?

- € Never
- € Rarely
- € Frequently



30. How are you using the school farm? Tick appropriately

- For demonstration
- As a museum
- For project
- As a commercial plot

31. For demonstration how often do you take your students to school farm?

- Once in a week
- Once in a month
- Once in a year

32. For the project purpose, indicate in the table bellow: the type of projects done by the student and the number of projects carried out in a year, if any

<b>Form</b>	<b>Type of Project done by the Student</b>	<b>No projects in/year</b>
Form one		
Form two		
Form three		
Form four		

33. On the commercial farm what type of enterprise have you initiated? Tick appropriately

- Poultry farming
- Bee keeping
- Fish farming
- Crop farming
- Beef keeping
- Dairy farming

34. Do you normally take all agriculture students on commercial plot to learn agronomic practices?

- Yes
- No

35. Do you have livestock on your school farm?

- Yes
- No

36. If yes do you allow students to carry out livestock routine management practices?

Yes

No

**SECTION C: CLASS SIZE AND STUDENT ACCESS TO SCHOOL FARM**

37. How many agriculture students do you have currently in form four?

Below 20

21-30

31-40

41 and above

38. With respect to the number of agriculture students given above, does your school have enough facilities for effective teaching and learning agriculture?

Yes

No

39. What is the student facility ratio?

Very high

Moderate

Low

Very low

40. How does class size affect utilization of the school farm?

Not at all

Somehow affects

Moderately affects

Highly affects

**SECTION E: INFLUENCE OF TEACHER PRACTICAL EXPERIENCE ON PRACTICAL LEARNING OF AGRICULTURE**

41. For how many years have you been teaching agriculture?

Less than 3 years

3-6 years

7-9 years

10 years and above

42. Do you normally carryout various routine management practices on livestock?

Yes

€ No

43. If No why

.....  
.....I

If yes, do you impart the same skills to the student?

€ Yes

€ NO

44. Have you handled a candidate class?

€ Yes

€ NO

45. For how long have you taught form four students?

€ Less than 3 years

€ 3-6 years

€ 7-9 years

€ 10 years and above

46. Have you ever used the tractor and/or its various components/parts while teaching the topic “Farm Power and Machinery?

€ Yes

€ No

47. In the table below, indicate by ticking the box that describes your experience in years, of teaching agriculture using the listed resources: If yes, for how long have you used this approach.

Resource	Never	Less than 2 year	3-5 years	6-8 years	9 years & above
Tractor					
Parts of a tractor					
Crop museum					
Crop demonstration plots					
Livestock					

#### SECTION F: PRACTICAL TEACHING OF AGRICULTURE

48. How often do you normally take your agriculture students to the school farm?

€ Never

€ Once in a term

€ Once in a month

€ Once in a week

49. Have you ever allocated your agriculture students individual plots on the farm to run their own projects other than the form four KNEC project plot?

€ Yes

€ No

50. How often do you normally use the tractor and/or its parts while teaching the topic “Farm Power and Machinery

- € Never
- € Rarely
- € Frequently

51. How do you use your school farm?

- € For demonstration
- € As a commercial plot
- € For KCSE project
- € As a crop museum

52. How often are the demonstrations conducted on the school farm?

- € Every lesson
- € Once in a week
- € Once in a month
- € Once in a term

*Thank you for responding to the questions.*

Appendix C: Research Permit

PAGE 2

THIS IS TO CERTIFY THAT:  
Prof./Dr./Mr./Mrs./Miss/Institution  
Evelia Vugutsa Josephine  
of (Address) Egerton University  
P.O. Box 536, Egerton.  
has been permitted to conduct research in


	Location
	District
Nyamira	County

On the topic: The influence of selected factors  
On secondary school student access to the school  
Farm as a facility for teaching and learning practical  
Aspect of agriculture in Masaba North Sub-County,  
Kenya

for a period ending: 31<sup>st</sup> December, 2013.

PAGE 3

Research Permit No. NACOST/RCO/14/013/1675  
Date of issue 8<sup>th</sup> October, 2013  
Fee received KSH. 1000



Applicant's Signature

For: Secretary  
National Commission for Science  
Technology & Innovation

## Appendix D: Map of Masaba North Sub-County

