

**CHALLENGES TO TEACHING AND LEARNING OF AGRICULTURE IN  
SECONDARY SCHOOLS IN KAKUYUNI DIVISION, KANGUNDO DISTRICT,  
MACHAKOS COUNTY, KENYA**

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## DECLARATION

This is my original work and has not been presented for an award of a degree in any other university.

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## **DEDICATION**

This work is dedicated to my husband and children for their support, patience and perseverance during my study period

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## **ACRONYMS AND ABBREVIATIONS**

FAO	–	Food and Agricultural Organization
FFA	–	Future and Farmers of America
GDP	–	Gross Domestic Product
ICRAF	–	International Centre for Research in Agro – forestry
ICT	–	Information Communication Technology
K.C.S.E	–	Kenya Certificate of Secondary Education
K.I.E	–	Kenya Institute of Education
NEPAD	–	New Partnership for Africa’s Development
MEHRD	-	Ministry of Education and Human Resource Development
MODE	-	Mediated Open and Distant Education
RELMA	-	Regional Land Management Agency
SAE	-	Supervised Agricultural Experience
SPSS	-	Statistical Package for Social Sciences
TIGET	-	Totally Integrated Quality Education and Training
UNESCO	-	United Nations Educational Scientific and Cultural Organization
USAID	-	United States Agency for International Development
YPARD	-	Young Professionals for Agricultural Research for Development

## ABSTRACT

The purpose of this study was to find out the challenges facing teaching and learning of agriculture in public secondary schools in Kakuyuni Division. The objectives of the study were to: find out the current status in teaching and learning of agriculture, uncover the institutional-based challenges and determine the non-institutional challenges in the teaching and learning of agriculture in secondary schools. Descriptive Survey research design was used for the study. Questionnaire and observation checklist were used as the instrument for data collection. The study was carried out in all the 12 secondary schools in Kakuyuni Division. The study targeted form four Agriculture students, Headteachers and Agriculture teachers. A total of 120 respondents were targeted by the study (constituting 10 teachers, 10 head teachers and 100 form four students). Purposive sampling technique was used to sample Headteachers and agriculture teachers while simple random sampling was used to sample students. Data was coded and analyzed using Statistical Package for Social Sciences (SPSS). On the status of teaching and learning Agriculture in secondary schools in Kakuyuni Division, it was found that all schools studied offer Agriculture as a subject. The study also found that Agriculture attracted few students compared to Business Studies with which it is paired in the curriculum. The major reasons for the choice of Agriculture were students' personal interests as indicated by 64% and performance in the subject as indicated by 24% of the students who took Agriculture. The study further found that a 87% of the students' indicated that they would consider taking Agriculture related careers. Regarding the institutional based challenges, the study found that resources such as school farm, Agricultural tools and Agriculture classrooms were inadequate. Other challenges included teacher workload and the nature of punishments given to students such as weeding flowers which affected their attitude towards learning Agriculture as evidenced by 78% of the student respondents. On the non-institutional challenges, the study found that unreliable rainfall and high poverty levels affected teaching and learning of Agriculture in schools. Other factors included inadequate Agricultural land, the fact that some students came from urban areas, the environment which is arid and semi-arid area which hinders Agricultural practice. The study concluded that the institutional based challenges facing teaching of Agriculture in schools include inadequacy of resources such as school farm, Agricultural tools and Agriculture classrooms. It was also concluded that the non institutional challenges facing teaching and learning Agriculture include: unreliable rainfall, high poverty levels, inadequate Agricultural land, the fact that some students come from urban areas and nature of the surrounding areas. The study recommended that schools should ensure that there are adequate classrooms and land for practical Agriculture work. It was finally recommended that other studies be done in other districts to determine the factors influencing the choice of Agriculture as a subject among students which was not a concern of this study.

# CHAPTER ONE

## 1.1 INTRODUCTION

From a global perspective civilization began with agriculture, when our nomadic ancestors began to settle and grow their own food, human society was forever changed (Nova, 1996). Not only did villages, towns and cities begin to flourish, but so did knowledge, the arts and the technological sciences.

Agriculture has an immense impact to humanity in terms of global food supplies, hunger alleviation, economic development and provision of employment (Nova, 1996). Therefore agriculture can be considered to be a pillar for human survival and hence the importance of agriculture being taught at all levels of education.

In the U.S.A, formal programs in agricultural education are conducted at secondary schools, community colleges and universities. As a vocational educational program, agricultural education focuses on three major components - formal classroom instruction, career experience programmes and leadership development. These components are delivered through a competency based curriculum in the context of agriculture in the USA (Lloyd and Osborne, 1988). Beyond the secondary agriculture program, community colleges and universities provide excellent opportunities for students to specialize and gain skills and knowledge in agriculture (Williams and Dollisso, 1998).

Agriculture is the traditional foundation of Chinese society and China is facing a great challenge in restructuring its system to meet the needs of the market economy. The

country's economic system is shifting from a centrally planned to a market-driven system (State Council, 1999). In particular agriculture education is playing an important role in preparing people for a new phase of rural development. According to Xiarong and Thomas (2002) China's economic reform movement proposed Agriculture curriculum and strategies to meet the needs of the new economic realities in Chinese agricultural education.

In sub-Saharan Africa, the agricultural sector is still the dominant provider of employment, and it remains crucial for economic growth. Moreover in most parts of Africa food security is still a critical issue and therefore food production will continue to be a major focus of agricultural education and training institutions (Vandenbosch, 2006).

In some countries in sub-Saharan Africa, agriculture has been introduced in general school curricula at secondary education levels as a compulsory or as an optional subject. The rationale for offering agriculture to secondary school students counter the apparent negative attitude to farming by many secondary school students, whose occupational choices are often limited, and thus exposing them to the knowledge and skills that they would require in agricultural production, should they choose to become farmers (Abalu, 2001).

Agriculture is the main source of livelihood for Kenyans and therefore teaching the subject in secondary schools effectively is very important (Mwangi and Mwai, 2002). Before independence in 1963, agriculture was taught in primary schools to the Africans only, and the method of teaching particularly the practical work made the subject

unpopular (Ngugi, Isinika, Temu and Kitalyi, 2002). Occasionally agriculture work was used as a punishment for errant pupils. However after independence, agriculture has been incorporated into the school curriculum. This has given it importance comparable to that of other examinable subjects in the secondary school curriculum.

With regard to teaching agriculture in secondary schools, during the period between 1965 and 1976, the United States Agency for International development, (USAID) played a prominent role in supporting the introduction of agriculture in secondary schools by financing the building of workshops, equipping of schools and the training of agriculture teachers at Egerton University. However due to the strict conditions that secondary schools had to fulfill before they could be allowed to teach agriculture, only about 1,000 students were taking the subject at the level by 1966 (Weir, 1967). This trend continued so that in 1980, only about 100 schools out of 1,760 were offering agriculture as an examinable subject.

In 1985, the 8-4-4 education system was introduced to replace the 7-4-2-3 system. This meant introduction of new curriculum that emphasized the need to make learners self reliant by the time they left school, by offering them broad – based and practice oriented curriculum (Republic of Kenya, 1981). Agriculture as a practical subject was therefore made compulsory in all primary schools and the first two years of secondary school education.

In Kenya, learners are taught agriculture at secondary school level to develop self reliance in agriculture, to demonstrate that farming is a dignified and profitable occupation and to enhance skills needed in carrying out agricultural practices. This is to develop occupational outlook in agriculture and to enable schools to take an active part in National development through agricultural activities (Vandenbosch, 2006).

The objectives of the secondary school education are aimed at preparing students to make a positive contribution to the development of society and to acquire knowledge, skills, and attitudes for the development of the self and the nation (Mwiria, 2002).

The educational objectives of teaching agriculture as a subject in secondary school in Kenya are spelt out in the syllabus as follows; promote an interest in agriculture as an industry and create awareness of opportunities existing in agriculture and related sectors, enhance skills needed in carrying out agricultural practices, provide background for further studies in agriculture, develop self-reliance, resourcefulness and problem solving abilities in agriculture, enable schools to take an active part in national development through agricultural activities and promote agricultural activities which enhance environmental conservation (Ministry of Education, 1998). Education in all its forms has the potential to empower people, by increasing their self confidence, their capacity to improve their livelihoods and their participation in wider process of social and economic change.

## **1.2 Statement of the Problem**

Since Agriculture is the main source of livelihood for the majority of Kenyans who live in rural areas, teaching and learning the subject in secondary schools effectively is very important (Mwangi and Mwai, 2002). Agriculture as a subject has been taught before and after independence with the overall purpose being the development of basic agricultural skills relevant to Kenya and the learners' home environment (Kenya Secondary School syllabus, 2002). Mwiria (2002) considers the aims of teaching agriculture in accordance to Kenya secondary school syllabus as reinforcing interest and awareness for opportunities existing in Agriculture and demonstrating that farming is a dignified and profitable occupation; to expand the students knowledge on basic principles and practices in Agriculture, develop students' understanding of the value of Agriculture to the family and community with a view of promoting self reliance, resourcefulness, poverty reduction, improved food security, problem solving abilities, an occupation outlook in Agriculture and promote agricultural activities which enhance environmental conservation.

Despite the importance of Agriculture, there is evidence that the number of students taking Agriculture is low. This can be attributed to institutional and non-institutional based challenges. UNESCO (1999) observed that lack of financial resources hindered the expansion of facilities which led to specific problems in vocational subjects like agriculture. They added that lack of funds prevents schools from developing their farms. It is upon this background that this study aimed at finding out the challenges facing



teaching and learning of agriculture in secondary schools in Kakuyuni Division, Kangundo District was conceived and conducted.

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

The purpose of the study was to find out the challenges facing teaching and learning of agriculture in secondary schools in the semi-arid Kakuyuni Division, Kangundo District.

### **1.4 Research Objectives**

This study was guided by the following specific research objectives:

- 1 To find out the current status in teaching and learning of agriculture as a subject in the Division
- 2 To identify institutional-based challenges in teaching and learning of agriculture in semi-arid regions
- 3 To determine the non-institutional challenges in teaching and learning of agriculture in secondary schools in semi-arid regions.

### **1.5 Research Questions**

Specifically, this study investigated the following questions:

1. What is the current status of the teaching and learning of agriculture as a subject in Kakuyuni Division?
2. What are the institutional based challenges in teaching and learning of agriculture in Kakuyuni Division?

3. What are the non-institutional based challenges facing teaching and learning of agriculture in Kakuyuni Division?

### **1.6 Significance of the Study**

The findings of this study are useful in the following ways;

First the study may provide data on the teaching and learning of agriculture for example, number of students taking agriculture and number of teachers teaching agriculture in secondary schools in semi arid regions. This information may be helpful in the evaluation of teaching and learning of Agriculture thus helping in putting in place the strategies aimed at improving teaching and learning of Agriculture in schools. Second, findings may be of value to teaching learning strategies and teaching learning resources in implementation of agriculture curriculum. Third, the schools teaching agriculture may use the findings in the attempts to make secondary agricultural education more relevant and effective. Fourth, the ministry of Education may use the findings of this study to design pre service and in-service courses for teachers of Agriculture. Fifth, the Kenya institute of Education may find them beneficial for curricular/syllabi development, according to the country's needs in the labor market demands and entrepreneurships.

### **1.7 Assumptions for the Study**

The assumptions made included;

1. That the information provided by the respondents through research instruments were true.
2. That the respondents participated freely without fear or other undesirable biases.

3. That the researcher accessed the agriculture teaching / learning resources available in the school under investigation.
4. That the research was able to investigate challenges facing teaching and learning of agriculture in secondary school.
5. The methods used to collect and summarize the information have yield valid data.

### **1.8 Limitation of the Study**

This study was carried out in Kakuyuni Division in Kangundo District, this limited the generalization of the findings of the study to the whole District.

### **1.9 Delimitation of the Study**

The study was limited to Kakuyuni Division in Kangundo District, thus the researcher was able to save on time and financial resources to be used in for the study.

### **1.10 Theoretical Framework**

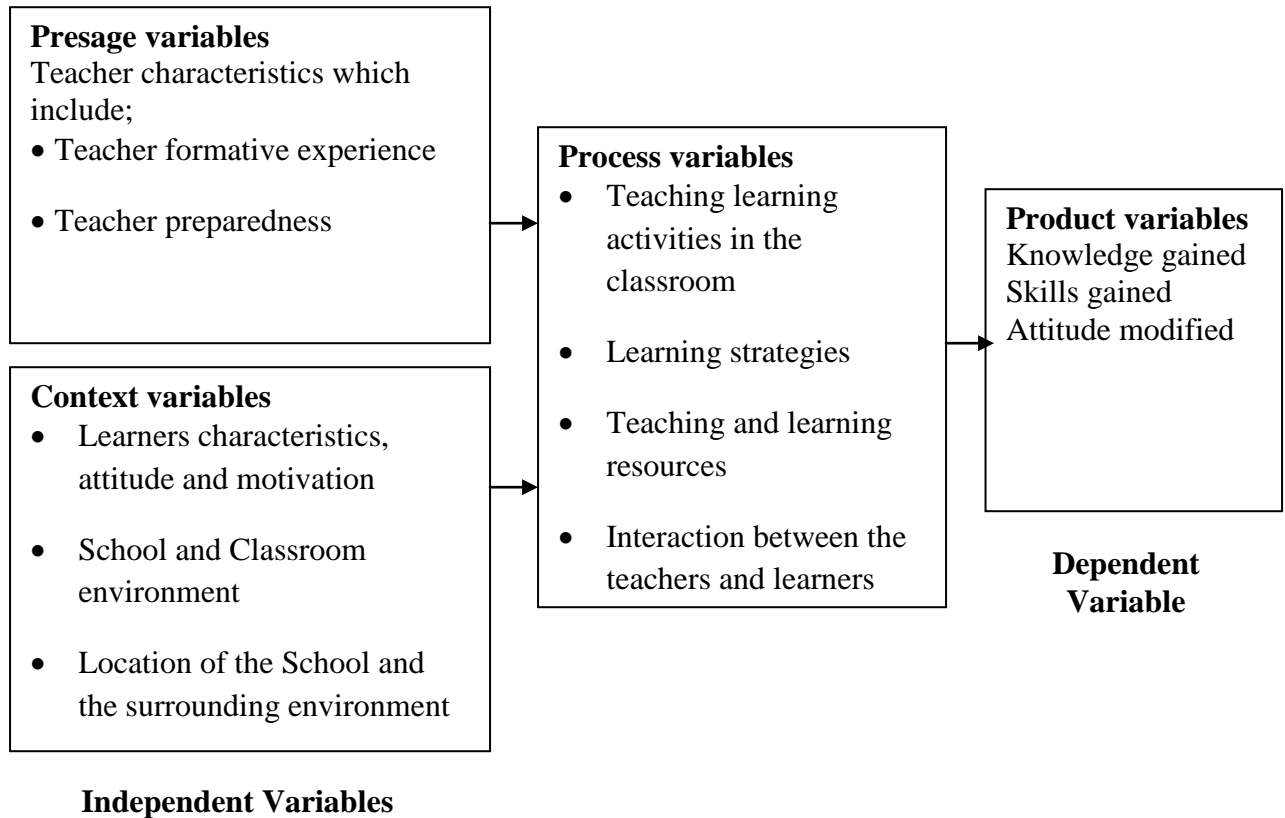
The study was based on Mitzel (1969) model. The model advances the view that teaching involves interplay between sets of variable: teachers and students, their interactions and the product of those interactions. Dunkin and Biddle (1974) expanded on the Mitzel model to include four major variable types which are; presage, context, process and product.

The presage variable includes teacher personality, preparation, general characteristics, background, competencies and inadequacies, teacher education experiences and teacher properties (Mitzel, 1969). The context variable addresses the student characteristics and classroom environment (Mitzel 1969). Process variables show the interaction or interrelationship between the teacher and the student. (Dunkin and Biddle1974).Smith, Kistler, Williams & Baker (2004) reported that all activities within the classrooms are considered process variables. The product variables are those associated with the effect of instruction (Mitzel 1969, Dunkin and Biddle, 1974).

Mitzel's model recognizes the presage variables as fundamental in understanding classroom problems and challenges using the experience of the teacher. The experience of the classroom teacher and the availability of teaching and learning resources tend to affect the learning environment (context), interaction between the teacher and the students (process) and effects of the instruction (product). On the other hand, the non institutional factors such as the climate may affect the learners' attitude towards the teaching and learning of Agriculture. This study was intended to adopt Mitzel's model and investigate the related challenges facing the teaching and learning of agriculture in secondary schools in Kakuyuni Division, Kangundo District.

## 1.11 Conceptual Framework

Figure 1.1 Conceptual Framework



**Source: Researchers (2012)**

A conceptual framework builds a structure or ‘concept’ of what has been learned in a particular area of study. It’s a hypothesized model identifying the concepts under study and their relationship (Mugenda and Mugenda, 2003). The conceptual models derived from variables are put to test in order to establish the significance of the proposed relationship. The variables used in this study are presage, context, process and product variables.

The presage variable is fundamental in understanding classroom problems and challenges using the experience of the teacher. Under the institutional factors, the experience of the classroom teacher tends to affect the classroom environment (context), interaction between the teacher and the students (process) and the effects of the instruction (product). On the other hand, the non institutional factors such as climate may affect students' attitude towards Agriculture as a subject which in turn affect its teaching and learning.

A study of the challenges facing teaching and learning of agriculture can improve the efficiency of the teacher and in turn improve student's achievements. It's believed that an articulation and identification of challenges agriculture teachers face with their wealth of experience can help in repositioning the vocational agriculture curriculum for pre-service and in-service vocational education, teacher preparation programme, planning and implementation (Ikeoji, 1997).

### **1.12 Definition of Significant Terms**

**Agriculture:** This is a subject taught in secondary schools. It is among the optional subject in the applied subjects' category

**Assessment:** Refers to the practice of evaluating a learner's level of understanding with regard to a particular topic studied.

**Institution-based challenges:** These are school context variables affecting the teaching and learning of agriculture such as the availability of teaching and learning resources.

**Learning strategies:** These are teaching methods used in the implementation of Agriculture curriculum in secondary schools

**Non Institutional:** These are factors outside the school which affects the teaching and learning of Agriculture

**Presage Variables:** these are dimensions of teacher personality and teacher experiences in teacher education programs that are considered to be potential predictors of teaching effectiveness.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter presents a review of related literature under the following subheadings; the status of teaching and learning of agriculture in secondary schools, institutional based challenges to teaching and learning of Agriculture and non-institutional based challenges to teaching and learning of Agriculture.

#### **2.1 The Status of Agricultural Education in Secondary Schools Worldwide**

Agriculture education is instruction about crop production, livestock management, soil and water conservation and various other aspects of agriculture (Schultz, Wiekert, Howard and Dickson 2008). Agricultural education also includes instruction in food education, such as nutrition which improves the quality of life for all people by helping farmers increase production, conserve resources and provide nutritious foods. The purpose of agricultural education in high schools in the United States is to provide students with the personal academic and career experiences essential for success in the fields of science, business and technology (Schultz Wiekert, Oison, Howard and Dickson 2008). High school agricultural education programme consists of three components namely classroom/ laboratory instruction, supervised agricultural experience (SAE) and future farmers in America (FFA). This study was therefore aimed at findings out the challenges facing teaching and learning of Agriculture in Secondary schools.



Classroom curriculum and laboratory exercises provide students with foundation knowledge in agricultural practices, preparing them for careers in food, fiber and natural resource industries. Supervised agricultural experiences provide students the opportunity to experience ownership of their own agricultural enterprises or work in the industry. Examples of SAE projects would be a student raising a crop or an animal, working on a farm or employment at an agriculture business such as machinery dealer. These projects offer “real world” experiences to students as well as practical application of concepts learned in the classroom. Supervised agricultural experience also enables students to develop skills in agriculture related career areas (Schultz, Wiekert Howard, Dickson, 2008). Future farmers in America (FFA) are a national organization that develops student’s potential for premier leadership, personal growth and career success. Students grow as individuals and leaders through their involvement in competitions, degree programs community service projects and state and national leadership conventions. The combination of the three components of agricultural education, classroom laboratory, SAE and FFA develop well rounded individuals who will become future leaders of the agriculture industry (Schultz, Wiekert, Oison, Howard, Dickson, 2008). It was therefore the interest of the researcher to find out the institutional and non institutional challenges facing learning of Agriculture in schools. By this, recommendations can be made to ensure that the challenges are addressed and to ensure that students are well equipped.

In China during the past decade, agriculture schools have started to take actions systems and to strengthen their vocational programs (Ministry of Education, 1998). There are 360 agricultural schools distributed among the provinces, autonomous regions and

municipalities throughout China. Agricultural schools are typically resident schools that require students to pass standardized admission examinations (Chen, 2000). These schools enroll graduates from junior secondary schools and each program lasts for three or four years. The Ministry of Agriculture undertakes the function of guidance and macro- management for all agricultural schools. Unlike in Kenya, Agriculture is an option subject during the subject selection at form two. Thus, its selection is influenced by different factors which are either institutional or non institutional.

Post primary agricultural education and training in sub – Saharan Africa has generally been very unresponsive to rapidly changing patterns of demand for trainees and failed to adapt and respond to new realities. According to Vandenbosch, (2006), this is putting serious pressure on post – primary agricultural education and training systems, especially because the change in demand profiles is much faster today than ever before. This rapid change in demand profiles is due to radical transformations in the agricultural environment combined with the fast alteration of rural and urban labour markets, scientific advances in the field of biotechnology and information communications technology (ICT). As a result, post – primary agricultural education and training in sub – Saharan Africa currently finds itself very much in an ‘adapt – or – perish’ situation. Also, it has not been re-oriented towards entrepreneurship and the private sector. Thus it is increasingly difficult for many graduates to find employment. In a global economy, food processing, storage and marketing are aspects of the production process that have become increasingly important to agricultural producers and thus to agricultural education. The increasing concern with the environmental protection and the preservation of natural

resources makes topics such as crop protection and integrated pest management, rational use of fertilizers and soil and water conservation more processing (Vandenbosch, 2006)

The educational objectives of post – primary agricultural education and training in sub – Saharan African countries quoted in policy papers, curricula and studies include the following;

- i) Giving learners knowledge and skills for better agricultural productivity. This objective gives post – primary agricultural education and training a vocational orientation for self employment.
- ii) Making the teaching of sciences more relevant, effective and practical. This objective is to overcome the common lecturing and rote – learning of science facts unrelated to the students environment and to make teaching and learning more relevant to the local situation.
- iii) Influencing learner’s attitudes, giving a positive motivation toward agriculture and rural development. Based on the view that education is an important factor in development, this objective assumes that school curricula play a dominant role in the formation of attitudes among students.
- iv) Preparing students for entry in higher and tertiary education institutions teaching agriculture, commonly quoted as an educational objective of secondary school agriculture to provide background for further studies in agriculture (Vandenbosch, 2006).

However, this has not been realized, there are still high levels of unemployment due to rural-urban migration, school leavers aspiring to get white collar-jobs, high levels of poverty and food insecurity in most African countries (Abalu, 2001). Studies show that few students are willing to take up agriculture careers because of the formed attitude towards the subject. Most African countries have low production in agriculture even though skills and knowledge for better agricultural production are learnt in both primary and post – primary education levels (Ngesa, 2006). It was therefore the interest of the researcher to find out the challenges facing teaching of Agriculture in Secondary schools.

World Bank (2004) underscores the fact that in Mozambique, agricultural education intends to provide students with knowledge and skills for increasing agricultural production and productivity. It is also expected to provide students with the skills they need to obtain employment and earn a sustainable livelihood. Vocational training is considered an essential element to create skilled workforce that is relevant to strengthening economic growth and lifting individuals and communities out of poverty. But Mozambique is rated among the most poor countries in Africa with the majority of its people living below the poverty line with earning below 1 dollar per day. This therefore underscores the importance of learning Agriculture in an economy. It is therefore the interest of the researcher to find out the challenges facing teaching of Agriculture in secondary schools so that appropriate strategies can be adopted to ensure the Agricultural curriculum can effectively implemented to equip the students with agricultural skills.

Dlamini and Miller (1997) established that at the secondary education level in Swaziland, the goal of junior – level agricultural education is to develop in students an appreciation for and a positive attitude towards agriculture, while the goal of the senior – level agricultural education programme is to prepare interested youth to gain entry to the college of agriculture at the university of Swaziland. According to Dlamini and Ngwenya (2004) girls choose to study agriculture in high school in Swaziland because of economic, personal, educational, family and social reasons.

Apori, Zinnah and Anor (2003) in reference to Ghana established that a students decision to choose agricultural science subjects is influenced by gender and socio-economic background of student, the level of knowledge about prospects in choosing agriculture as vocation, the terminal nature at agricultural colleges, where trainees are awarded certificates in agriculture, the influence of parents, guardians and peers who accord agriculture low recognition compared to other professions. In Kenya, evidence has shown that few students chose other options in the category of applied subjects as opposed to Agriculture. This imbalance in the choice may be attributed to the challenges facing the teaching of Agriculture which can be institutional or non institutional.

Despite having workable educational objectives of post – primary agricultural education and training in sub – Saharan African countries, there is an increased trend of food insecurity, rural- urban migration and high poverty levels. The countries are meant to be in the group of underdeveloped countries in the world. Poor infrastructures and low levels in technology among others contribute to this. In this study, these are attributed to the non

institutional challenges. The study sought to explore the non-institutional challenges facing the teaching of Agriculture.

In Kenya agriculture is offered at all levels of the formal education system. The primary level has 8 years of compulsory universal education system and agriculture is integrated in the science subject. The secondary schools level lasts for four years and agriculture is offered as an optional subject. There are 3 categories of tertiary education levels, that is, certificate, diploma, and degree, and agriculture is offered in the three levels (Kironchi & Mwangombe, 2007).

The teaching of agriculture in Kenya is expected to promote the acquisition of skills for self – reliance in farming (Mwiria, 2002). It is viewed as particularly critical for the development of Kenya as agriculture is the main economic activity in most parts of the country. The overall objective of the course is the development of basic agricultural skills relevant to Kenya and the learners’ home environment. The subject is meant to have a large practical component to enable learners acquire useful agricultural practice skills.

Mwiria (2002) identifies the goals of teaching agriculture aims at reinforcing interest and awareness of opportunities existing in agriculture by demonstrating that farming is a dignified and profitable occupation. A second aim is to expand the student’s knowledge on basic principles and practices in agriculture. The third aim is to develop students understanding of the value of agriculture to the family and community with a view to promoting self reliance, resourcefulness, problem solving abilities and an occupation

outlook in agriculture. Fourth, students who take the course are expected to be active participants in rural development activities while in school.

The content of the agriculture syllabus includes crop and livestock production, farm machinery, farm structures and agricultural economics. Key areas of coverage include soils and soil fertilities, water conservation supply and irrigation, land reclamation, farm layout, principles of crop production, crop parts and diseases, crop production practices, crop types; principles of livestock production, farm power tools, equipment and machinery, farm records, land tenure and land reform, production economics, farm accounts, agricultural marketing and agricultural organizations (Mwiria, 2002).

Ngesa (2006) notes that while agriculture is an optional subject at the secondary school level in Kenya all public secondary school offer the subject. Comparative data on candidature by subjects, the KSCE examination for 2005 shows that agriculture at the secondary level attracts over 40% of the high school students (106,437 students out of a total of 260,665 have chosen agriculture as a subject) apart from the three compulsory subjects (mathematics, English and Kiswahili) there are 29 other subjects from which students are expected to choose an additional four to six subjects. Among these 29 subjects agriculture was ranked fifth in popularity. Ngesa further established that professional agricultural education graduates are estimated at less than 50% of the teachers currently teaching agriculture in secondary schools. This indicates that agriculture has a large number of students who undertake it while the teachers are few.

Teaching large numbers has some challenges. This study intended to find out these challenges.

The agriculture curriculum formulators expected graduates of the subject in secondary schools to be able to plan their farms keep relevant records and employ the best agricultural practices in their farms (Mwangi, 2010). However, the effective teaching and learning of agriculture in secondary schools needs review and probably, overhaul to accommodate emerging issues in modern day economies that Kenya proudly finds itself in over the years. The teaching of the subject has been hampered by lack of suitable teaching and learning materials. Agriculture is a skill oriented subject where theory forms an entry point and learners get initiated to the practical experience.

Secondary school agriculture teachers are trained at Egerton University and Kagumo Teacher's College. Egerton University offers Diploma in Agricultural Education and extension, Bsc in Agricultural Education and extension. It also offers masters and doctoral degrees in agricultural education.

Kagumo Teacher's college together with Kenya Technical Teachers College offers a Teachers Education Diploma with various specializations. Egerton University also provides a post graduate Diploma in Education to professionals who have university degrees in agriculture, but lack professional education training. The university of Nairobi has also recently started a Degree programme in Agricultural Education and Extension (Vandenbosch, 2006).



## **2.2 Institutional Based Challenges to Teaching and Learning of Agriculture**

These are the internal challenges encountered within the school as the agriculture curriculum is being implemented in connection to Headteachers, agriculture teachers, agriculture students, and the teaching learning process.

### **2.2.1 Teachers**

Mitzel (1960) introduced the concept of presage variables. The term denotes dimensions of teacher personality and teacher experiences in teacher education programs that are considered to be potential predictors or presages of teaching effectiveness. Their relevance depends on an assumed or conjectured relationship to other criteria that is process or product. The presage variable describes the teacher in four distinct areas (a) Teacher personality attributes (b) Characteristics of teacher training (c) Teacher knowledge and achievement and (d) In-service teacher status characteristics.

Teacher formative experiences are both historical and contemporaneous (Goliath, 2008). Teachers may have grown up in lower or higher socio-economic communities, gone to more and less desirable schools and learned to speak one or more languages. These factors are likely to influence their professional personas and their own development as teachers, once they are enrolled. During their program tenure by virtue of their participation in all aspects of university life or any other college they acquire knowledge that is likely to influence their professional practice. Academic and pedagogical coursework, field experience, technology use, participation in volunteer activities and the

attitudes and abilities of those whom they study, among other factors can be expected to shape or form teachers planning and teaching behavior (Goliath, 2008).

Research on teacher's gender, physical characteristics dispositions and cultural or ethnic backgrounds has been thought to influence life in classrooms. Studies of teacher properties such as psychological traits and states, motives, abilities, propensities, beliefs and attitude are plentiful (Dunkin and Biddle, 1974). This is an indication that teacher characteristics has a bearing on the teaching and learning of Agriculture in secondary schools.

The presage variables are relevant for what they might reveal about teacher's capacities to demonstrate particular teaching processes. Therefore, factors such as academic and professional components of teacher education programs can be expected to shape teachers abilities to behave in ways that encourage pupil teaching (Goliath, 2008). Good teacher training equips its clients with good curriculum management skills.

The pre-service education prepares student teachers by equipping them with necessary academic and professional competencies. Other than professional and academic competencies, it's the role of pre-service teacher training programmes to produce all round teachers equipped with a body of knowledge attitude and skills to enable them correctly interpret the intended curriculum (Oluoch, 1982)

Douglas (1964) remarks that a teacher is considered not to have taught until a pupil has learnt. It has been noticed that the trained personnel make learners achieve higher in academic than the untrained lot. The national Commission on Educational objectives and policies (1976) observed that the quality of teaching staff is important. It says,

*“The quality of the teachers is of paramount importance in determining the quality of educational on which intellectual development is to be based” pg: 17.*

The teacher quality is assessed with reference to the level of education and training, frequency of attendance of in-service courses and on the number and type of disciplinary actions taken against teachers (Douglas, 1964).

Teaching experience (as represented by number of years of teaching) and teaching qualification are positively co-related with student achievement. GOK (1999) appreciated the importance of teaching experience and in fact recommended that promotions of teachers be based on proven merit and experience. Some behavior such as teacher enthusiasm degree of orientation of teacher talk to achievement significantly affects student achievement. Lesley (1976) says that, at all levels of teaching agriculture; the major constraint is the quality of teaching. Unless a teacher can achieve personal relationship with his students or an extension worker with his farmers; unless students can be inspired to seek further knowledge themselves; unless enthusiasm can be brought to bear on the teaching, the teaching will be lifeless and the frames of inspiration remain lifeless.

Kivuva (2001) reaffirmed this by saying that the quality of teachers is important aspect in determining the level of education performance and achievement in examination. To fulfill their role, the teachers must first know their teaching subjects well. Ngau (1987) highlights on the quality credential of the teachers. He puts it that credential of teachers both in pre-service education attainment and the type of professional attainment given to them may be a major determinant of the quality of Kenyan schools.

GOK Report (1999) recommended that in-service programmes be regularly organized for teachers to improve their pedagogical skills in order to enhance quality. It's important to have a well qualified and highly motivated teaching force capable of understanding the needs of learners and curriculum in order to implement it effectively. Such teachers would have the interest necessary in teaching agriculture as well as to create the urge to learn in the students.

A trained teacher is an asset to the institution in which he/she is an instructor (Onguti, 1987) since a teacher has learnt the tricks of handling individual differences in classroom situation; he is well placed to ensure effective learning takes place. The interest of the researcher was therefore to find out the institutional challenges facing teaching of Agriculture which entails teacher characteristics such as qualifications.

### **2.2.2 Students**

Claxton and Murell (1987) describes a person's learning style as consisting of distinct behaviours which serve as indicators of how a person learns and adapts to learning

environment. They also describe it as the educational conditions under which an individual is most likely to learn. Mark (2008) indicated that a learning style influences students' preference for a particular teaching strategies and learning environments.

Classroom learning environment includes elements of teacher's interpersonal style of interaction communication (Deci and Ryan 2002). High school students' perceptions of classroom learning environment strongly predict disciplines, specific perceptions of competence and instrumentality of the content, as well as goal orientation and they can compensate for negative social and ability comparisons. The quality of the classroom environment in schools is a significant determinant of student learning. Thus, this study sought to find out how different learner characteristics affect teaching and learning of Agriculture in Secondary schools.

Students are seen as context variable which refers to those variables that involve background of the learners, their prior knowledge and skills, attitudes towards learning and learning styles. In addition, context variables consist of the nature of the pupils and the physical or instructional situation or setting in which educational process is taking place (Dunkin and Biddle, 1974). This determines the nature of classroom the teachers have to face. They further put it that its advantageous if teachers could observe and identify the nature of their students, their background and disposition they bring into class to reciprocate with teaching methods suitable for them to attain maximum learning. Learners' characteristics are those things which every learner has, but which may not be common to all learners. Gender, age, experience and ethnicity are examples of learner's

characteristics (Mark, 2008). High school learners are qualitatively different from younger learners. Using the right instructional strategies to maximize the learning advantages and addresses the learning challenges of high school learners can make all the difference in their success.

Students' characteristics are influenced by past and present achievement, feedback from teachers and peers, and features of the current classroom learning environment (Maehr and Midgley, 1996). The motivations that students develop in school influence their future goals expectations and intentions some of these motivations and future outcomes are generalized to school overall, while others are specific to certain subjects areas and classes. (Hardre, Sullivan and Crowson, 2009).

Student perceptions of the content also influence motivation. Motivation influences achievement along with future expectations and intentions. Engagement is the students attention and focus on achievement related contents and tasks (Handre, Sullivan, Crowson, 2009). They added that students with more positive motivational profiles in a particular subject area are more likely to take courses in that area and to choose related college majors and career paths. This study therefore focused on individual students characteristics which affect teaching and learning of Agriculture in Secondary schools.

Learning styles of students have been found to influence the educational process and student's opportunity to learn (Claxton and Murell, 1987). Researchers have suggested that learning style is influential in students' academic choices. Schroeder (1993)

acknowledged that accommodating variations in learning styles can improve curricular and the teaching- learning process in high school education.

### **2.2.3 Process of Teaching and Learning**

Process variable examines the actual activities that take place in classrooms (Dunkin and Biddle, 1974). They comprise the observable behaviours of both pupils and teachers. As often assumed, the success of teaching in the teachers hands; how and why the teachers behave in class affects teaching and learning of Agriculture.

The methods employed are either teacher centered or student centered learning. This refers to all the observable activities that takes place between teachers and students in class, how teachers teach, how students respond and so forth. Fauziah (2008) review on pedagogy and classroom practices revealed that the teacher-centred and student centred teaching methods are basic to most theoretical and teaching propositions. It's believed that much of the success in teaching in classrooms lies in the teacher's hands because they are responsible in stimulating student's interests and in gearing the mood and flow of the class. This is the final phase where the outcome depends largely on the nature of the teacher's instructions and on the student's reception. It's the observable changes that come about in students as a result of their involvement in classroom activities with their teachers and other students. The teacher centred teaching method is inclined to be more traditional where the teacher leads the class most of the time, while the student-centered teaching method takes on the more progressive channel that allows for students maximum participation (Fauziah, 2008).

Process of teaching and learning involves teaching, learning strategies and teaching learning resources. Teaching process is therefore an important institutional factor affecting teaching and learning of Agriculture in Secondary schools.

### **Teaching Learning Strategies in Agriculture**

Agriculture education and training is special in comparison with other forms of education and training in that agriculture cannot be learned solely in the field or solely in the classroom (Vandenbosch, 2006). Practical training such as traditional apprenticeship training should ideally be complemented by more formal learning to enable many aspects of agriculture and rural development to be seen in their true perspective (Vandenbosch, 2006).

Teaching learning strategies are traditionally referred to as methods of teaching (Kisirikoi, Wachira and Malusu, 2008). Modern trends in teaching emphasize certain approaches which determine the strategy to be used. These approaches include; interaction approach, collaborative approach, transmission approach, experiential approach and facilitation approach. Interaction approach is where there is exchange of ideas between the teacher and the learner or among learners themselves as in group work. Collaborative approach is where learners share ideas in groups or projects. Transmission approach, the teacher dominates the lesson by use of lecture. In experiential approach learners life experiences are explored and used as a basis for development of new knowledge and passing judgment. Learning is based on the learner's experiences in the community. Facilitation approach teacher provides the stimulus for the learners'



interaction with new knowledge and also provides opportunities for the learners to learn. The teacher is merely a guide and director of learning.

From the above approaches the agriculture teacher determines the strategy to use depending on the content he is teaching the learners. The most used strategies in teaching agriculture are, lectures, demonstrations, discussion, educational visits, projects, question and answers, assignments and practical (Vandenbosch, 2006).

Lecture as a method of teaching involves transmission of information from the teacher to the learner. The teacher reads out the notes to the learners as he explains to them. The method is mainly teacher – centered and the learner’s activity is listening and taking notes. Demonstration is a practical way of explaining or describing a process or an activity. The teacher demonstrates an activity before engaging the class in the same. The teacher may also use one of the learners to demonstrate the activity. Discussion is a form of interaction which involves learners’ participation through talking or writing in which merits and demerits of a process or object are considered it encourages an open exchange of ideas. Educational visits provide learners with an opportunity to explore other environments and make school life more interesting it provides the learners with exciting experiences that bring joy and satisfaction that would not have been experience in the normal classroom interaction (Kisirikoi, Wachira and Malusu 2008). However a number of instructors are of the opinion that field trips are not well – planned and scheduled (Alemayehu, 2006).

Good (1959) defines a project as a significant practical unit of activity having educational value and aimed at one or more definite goals of understanding, involving investigation and solution of problems, and frequently the use and manipulation of physical materials, planned and carried out to completion by the pupils and the teacher in a natural “real life” manner. The practical orientation and education value of projects make them suitable for implementing the practical aspects of secondary agriculture.

Assignments are a common practice in most schools. This involves literature review and at times interview or field observations. During a study of literature students are assisted to learn how to extract facts and figures from books and reports and to prepare a brief written report on their findings (Vandenbosch, 2006). Assignments have become an excellent teaching aid that increases the students’ communication skills (Alemayehu, 2006).

Although post – primary agricultural education and training has been in existence for many years, teaching and training methods are still far from satisfactory. Because they are largely focused on transferring knowledge which is judged to be useful in examinations. Most of the information is merely memorized and learners do precisely what they are told by their teachers or trainers (Vandenbosch, 2006). The teachers have been subjected to do this due to certain shortcomings which this study intends to find out. Practical training is also included as part of the teaching and learning processes and has several challenges. (Vandebosch, 2006) This study intends to investigate what these challenges are also.

Some curricula and teaching and learning support materials resemble simplified versions of curricula of post – secondary and higher agricultural education and training institutes. Little help is given in appropriate teaching and learning methods for post – primary agricultural education and training (Riedmiller and Mades, 1991). This study therefore sought to find out the teaching methods used in teaching and learning agriculture in Secondary schools in Kangundo District.

### **Teaching Learning Resources in Agriculture**

Teaching learning resources are all materials and equipment used to enhance effective learning (Kisirikoi and Malusu, 2008). A teacher selects develops and reorganizes teaching – learning resources for effective teaching. A teacher is therefore the most important teaching – learning resource.

According to Johnson (1968) having satisfactory facilities equipments and materials should not be minimized in establishing the curriculum because of their contribution to the effectiveness of the school. Their availability will enhance or inhibit the implementation of curriculum. It then follows that facilities, equipments and materials influence the implementation of secondary agriculture curriculum.

Because of the development in modern technology, teachers no longer have to rely solely on words to make their meanings clear. There is great variety of materials around that can be used to make meaning more vivid and more interesting. These materials are the teaching learning resources.

Malcolm (1976) observes that, these resources by being presented raw offer stimulating alternative to the conventional textbooks. The latter summarizes, explains, interprets and as a consequence subtly structures perception and understanding. Teaching learning resources help the learner to learn efficiently. A shortage of these useful resources will impede learning.

Learning resources play a key role as far as learning is concerned, Douglas (1964) observes that good teachers as they teach, keep in mind both what they teach and what they teach with. The quality and adequacy of resources such as physical facilities, equipment will establish whether this is the case.

According to Vandenbosch (2006) secondary school syllabus for agriculture in Malawi not only provides the teacher with content, but also suggests appropriate teaching and learning strategies. These teaching strategies include description, discussion, group work, observations, records and reports, visits, videos, brainstorming, demonstrations, project work and practical.

The quality of teaching agriculture in technical schools is a concern in Mozambique. Poor teacher training, insufficient materials and lack of pedagogical support has meant that most teachers rely on teacher – centered didactic methods, emphasizing repetition and memorization over learner – centered approaches that encourage creative thinking and skills – based learning. Teachers are poorly equipped to deal with some of the challenges that the system poses such as the reality of large class size, unavailability of didactic

materials and gender disparities (Giva, 2006). This study wants to find out whether the same applies in Kenyan Secondary Schools.

In Kenya Ngesa (2006) indicated that teachers of agriculture use lecture, class discussion and group discussion methods. Demonstrations, practical, experiments, projects and problem – solving are hardly used. Library assignments are moderately used thus the need to find out whether teaching and learning of agriculture is like this in Kakuyuni division Kangundo district. Teaching and learning materials have a direct bearing on quality as they determine how effectively the curriculum is implemented.

The GOK Report (1999) observes that quality education cannot be achieved and sustained if the resources and facilities are not available in sufficient quantities. It recommends that all school be provided with adequate physical facilities, teaching – learning resources and equipment to enhance quality learning.

The availability of teaching and learning support materials is among the most important determinants of effectiveness of post – primary agricultural education and training (Vandenbosch 2006). Even if teachers are competent and well trained, they will often find it difficult to teach effectively because of lack of adequate teaching and learning resources that are relevant to the local agricultural situation.

### **2.3 Non- Institutional Based Challenges**

These are external challenges that are encountered in teaching and learning of agriculture in secondary schools. The proposed locale for research is Kakuyuni Division of Kangundo District in Eastern Province of Kenya. The local climate is semi-arid, the terrain is hilly and the district has an altitude from 1000 to 1600 meters above sea level. It's also characterized by low erratic rainfall of up to 700mm per annum, periodic droughts and different associations of vegetative cover and soils. Inter-annual rainfall varies from 20-50% with average up to 700mm. Agricultural harvest are likely to be irregular although grazing could be satisfactory (Sconfield, 1995).

In Kenya, there are regional differences in popularity of agriculture as an optional subject in secondary schools with lower interests in agriculture subject in urban, semi-arid and arid areas (Ngesa, 2006). Due to minimal agricultural activities in these regions the learners might not realize the importance of agriculture.

Rural schools serve large numbers of minority student families in socio-economic distress, and many single parent families with little education. Rural students are at risk of low motivation and lack of school success (Corbett, 2009). Most rural schools offer fewer support and extra curriculum programs overall than the non-rural schools. Local community values may differ from and even conflict with school based values and goals framed on a national, rather than local model. Schools focuses on preparing the youth for lives and job opportunities very differently from the environment where they live (Hardre, Sullivan and Crowson, 2009). This indicates why parents would encourage the

learners to opt for something different from what they do in the rural homes and that is diverting away from agriculture, for to them it appears not a profitable occupation.

Attitudes is an inward feeling expressed by outward behaviour. People always project on the outside what they feel in the inside. Borg and Gall (1989) noted that attitudes generally consist of three components; affective, cognitive and behavioral. Affective referring to individuals feelings about the attitude object, cognitive is an individuals belief or knowledge about the attitude object and behavioral an individuals predisposition to act towards the attitudes object in a particular way.

The teachers and learners have certain feelings, beliefs and knowledge towards agriculture as a subject and they behave in a certain way towards the subject. The Phelps Stokes commission of 1925 emphasized the vocationalization of education for all Africans. Through apprenticeship and indenture the minor farm pupils were trained in skills. The Africans were meant to be the workers in white settlers' farms and homes. The status of agriculture as a less serious subject was taking shape. There was formation of indigenous schools to offer academic education. This kind of education was offered only to the Europeans who were the rulers and Asians who were their assistants. Agriculture was offered to the worker and Africans received what was meant to be for the worker. This led to resentment and a negative attitude towards the training offered to the Africans. This seems to have been carried forward to date with the learners.

In many schools, pupils are sent to work on the school farm as a punishment. Bergman (1980) says this is bound to create a negative attitude to farm work rather than foster positive attitude. It highlights the hardships of farm work and policy more than anything else the real attitudes of teachers towards manual labour.

Apori, Zinah and Annor (2003) looked at factors that influenced students' choice of an agricultural science program at the senior secondary level in cape coast in Ghana. They found that a students decision to choose agricultural science subject is influenced by parents, guardians and peers who accord agriculture low recognition compared to other professions such as pharmacy, law, architecture, engineering, medicine and accounting, gender and socio – economic background of students such as occupation of parents, communities, towns or cities in which they live; and facilities for the teaching of agriculture and the pedagogy used in teaching agriculture.

The greatest problem facing agricultural education in Nigeria is attitudinal yet most crucial to any education that involves manual labour is a favorable attitude (Oluwole 1987). Factors such as cultural traditions, early childhood socialization, parental expectations, the actual hard work involved in manual labour, the reward that go with it, the behaviour and attitude of teachers, influence the attitude the pupils acquire. This study will investigate the attitudes of teachers and learners towards agriculture as a subject.



## **2.4 Summary**

In this chapter, the researcher has reviewed literature on the status of Agriculture in schools, institutional based and non institutional based challenges facing learning of Agriculture in schools. Literature has revealed that the institutional challenges facing the teaching of Agriculture revolve around the characteristics of the teaching staff, students' characteristics and teaching and learning process. This study sought to fill the existing gaps in the literature on the challenges facing teaching of Agriculture in Secondary schools.

## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the research methodology for the study. The chapter describes the research design, the target population, the sampling techniques and sample size, the research instruments, piloting, data collection procedures and data analysis.

#### **3.2 Research Design**

The study adopted a descriptive survey design. The design aims at describing the state of affairs as they exist. According to Gay (2003), a descriptive survey is, a process of collecting data in order to answer questions concerning the current status of the subject. Orodho (2009) states that a survey is a method of collecting information by interviewing or administering questionnaires to a sample of individuals. It is the most frequently used method for collecting information about people's attitudes, opinions, habits or any of the variety of social issues related to education.

A survey design was appropriate because it enabled the researcher to obtain pertinent and precise information from the respondents to establish the challenges in teaching and learning of agriculture in secondary schools in Kakuyuni Division, Kangundo District.

#### **3.3 Research Locale**

The study was conducted in public secondary schools of Kakuyuni Division, Kangundo District in Machakos County. The division is rural and local climate is semi-arid. The

terrain is hilly with an altitude of about 1000 to 1600 metres above sea level. The main food crops grown are maize, beans, cassava and pigeon peas. The division was selected for the study due to the fact that it is located in the semi-arid areas of the District. The climatic conditions existing in the study area are perceived to be one of the non institutional challenges facing teaching and learning of Agriculture in Secondary schools in the Division. The Division was also chosen due to the familiarity of the researcher to the area and its accessibility. Singleton (1993) notes that the ideal setting for any study is one that is easily accessible. The locale was easily accessible. It is 67km from Machakos town towards North and transport was not a problem.

### **3.4 Target Population**

The population in the study comprised of all form four students who take Agriculture in the 12 secondary schools, the 12 Agriculture teachers and the 12 School heads.

### **3.5 Sample Techniques and Sampling Size**

Kakuyuni division has 12 public schools which are all mixed gender schools and only 5 are boarding schools. All the schools are district schools. Since there are few schools in Kakuyuni District, all the schools were studied where two were used for piloting while 10 were used in the actual study. Simple random sampling technique was used to sample 10 students in form four taking Agriculture from each of the schools studied. A total of 100 students were therefore sampled for the study. Purposive sampling technique was used to sample Head teachers and Agriculture teachers from the ten schools and the total sample

of teachers were 10 respondents. The total sample size was 120 respondents which gives 30% representation of the target population.

### **3.6 Research Instruments**

Questionnaires and observation checklist were used as instruments for the study. Observation checklist was used to confirm the availability of teaching learning resources for Agriculture.

Questionnaires were used because they are considered economical and easy to formulate and analyze. In addition, questionnaires elicit a lot of data and gives greater depth of response. The questionnaires had both closed and open ended items and comprised likert scale rating items. The scale was rated as strongly agree, agree, uncertain, disagree, strongly disagree. The instrument was used to collect data from teachers' and learners' on challenges facing teaching and learning of Agriculture in secondary schools.

### **3.7 Piloting**

According to Mugenda and Mugenda (1999), piloting refers to pre-testing of the research instrument by administering it to a selected sample which is similar to the actual sample which the researcher plans to use in the study. Piloting of the research instruments was done in two schools which were not included in the actual study. The pilot study was used to identify items in the questionnaire that were ambiguous or unclear to the respondents and hence changed or modify them. The pilot study also helped the researcher to familiarize herself with the administration of the instrument.

### **3.7.1 Validity**

Kerlinger (1986) states that validity is the extent to which an instrument measures what it's supposed to measure according to the researcher's subjective assessment. Orodho (2009) noted that validity is concerned with the degree to which an empirical measure or several measures of a concept accurately represent that concept. To ensure the validity of the instruments, the researcher sought the opinion of her supervisors on the ability of the instrument to collection the required information for the study.

### **3.7.2 Reliability**

According to Kombo and Tromp (2006) reliability is a measure of degree to which research instruments will yield constant results after repeated trials. Orodho (2009) observes that reliability of an instrument is the consistence in producing similar results over a period of repeated trials. To test the reliability of the instruments, test-retest method was used. According to Orodho (2008), the following steps were followed to test reliability of the instruments:-

- (1) The developed questionnaires were given to a few individual subjects for the study.
- (2) The answered questionnaires were scored manually.
- (3) The same questionnaires were administered to the same group of subjects after a period of one week.
- (4) The questionnaire responses were scored manually.
- (5) A comparison between answers obtained in 2 and 4 above was made.

The Pearson product-moment correlation coefficient formula was used to determine how the items correlate. The formula is :

$$r = \frac{\sum_{i=1}^n ((x_i - \bar{x})(y_i - \bar{y}))}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}}$$

Where r = is the Pearson correlation coefficient

x = one Pearson score on the first half of the items

$\bar{x}$  = is the mean score of the first half of the items

y = one Pearson score on the second half of the items

$\bar{y}$  = is the mean score of the second half of the items

The study got a coefficient of 0.69 which is about the 0.7 reliability coefficient recommended by Mugenda and Mugenda (2003).

### 3.8 Data Collection Procedures

The researcher administered the instruments to the respondents who were given ample time to respond to the items before the researcher collected the questionnaires. This was to ensure achievement of a good return ratio and help respondents to get a chance to seek clarification on items which might have proved difficult to understand.

### 3.9 Data Analysis

Primary data collected from the field was first edited and cleaned. The responses were then coded for analysis. Coding was done to summarize the responses given by the respondents for analysis. The data was analyzed with the aid of a computer using Statistical Package for Social sciences (SPSS) as a tool for analysis. Quantitative data

were analysed using descriptive statistics such as frequencies, percentages while thematic analysis technique was used to analyze qualitative data collected using open ended questions. The analyzed data were then presented in the form of tables, pie-charts and bar-graphs where applicable.

### **3.10 Logistical and Ethical Considerations**

The researcher secured letter from the School of Education Kenyatta University which was used to access research permit from the Ministry of Education. This letter was used in the collection of the data to inform the respondents of the authority to carryout the research.

The researcher arranged with the head teachers to confirm the dates for data collection and get the consent of the school administration. This was to eliminate the cases of surprising entry into schools without prior visit to clarify on the intention of the visit.

The researcher ensured confidentiality of the information given by the respondents. This was done by using the information without mentioning the specific names or schools where the data is collected from.

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND DISCUSSION

#### 4.1 Introduction

This chapter presents data analysis and discussion of findings.

#### 4.2 Biographical Information of the Respondents

A total of 120 respondents were targeted by the study (constituting, 100 students, 10 teachers and 10 head teachers). The researcher got a response rate of 100%. This section presents the biographical information of the respondents such as gender, qualifications and teaching experience.

##### 4.2.1: Distribution of Respondents by Gender

The respondents were first asked to indicate their gender. These are presented as shown in Table 4.1 below.

**Table 4.1: Distribution of the Respondents by Gender**

<b>Gender</b>	<b>Students</b>		<b>Teachers</b>	
	<b>Frequency</b>	<b>Percentage</b>	<b>Frequency</b>	<b>Percentage</b>
Male	65	65	8	80
Female	35	35	2	20
<b>Total</b>	<b>100</b>	<b>100</b>	<b>10</b>	<b>100</b>



Table 4.1 shows that 65(65%) of the student respondents were male while 35(35%) were female. On the other hand 8(80%) of the teacher respondents were male while 2(20%) were female. General conclusion was that most of the students who take Agriculture are male and that most of the teachers are also male.

#### 4.2.2 Distribution of Teachers by Qualifications

The teachers respondents were asked to indicate their professional qualifications. These are as presented in Figure 4.2.

**Table 4.2 Distribution of Teachers by Qualifications**

<b>Teachers Qualifications</b>	<b>Frequency</b>	<b>Percentage</b>
Degree in Agriculture	6	60
Degree but not training as a teacher in Agriculture	2	20
Diploma in Agriculture Education	2	20
<b>Total</b>	<b>10</b>	<b>100</b>

Table 4.2 shows that 2 (60%) of the respondents had degree in Agriculture, 2 (20%) had degrees but were not trained in Agriculture and another 2 (20%) had diploma in Agriculture education. It can generally be concluded that majority 6 (60%) of teachers taking students in Agriculture in secondary schools in Kakuyuni Division are qualified.

### 4.2.3 Distribution of Teachers by Teaching Experience

Teacher respondents were asked to indicate their teaching experience. These are as presented in Table 4.3.

**Table 4.3 Distribution of Teachers by Teaching Experience**

<b>Teaching Experience</b>	<b>Frequency</b>	<b>Percentage</b>
1-5yrs	1	10
6-10yrs	3	30
11-15yrs	4	40
Above 15 Years	2	20
<b>Total</b>	<b>10</b>	<b>100</b>

As shown in Table 4.3, it turned out that 4 (40%) of the teachers had served for a period between 11-15 years, 3 (30%) had served for a period between 6-10 years, 2 (20%) had served for a period more than 15 years and that 1 (10%) of the teachers had served for a period between 1-5 years. From the results of the study, it can be said that most of the teachers had taught for a long period of time and therefore they were considered by the researcher to have information on the challenges facing teaching and learning of Agriculture in Secondary schools in Kakuyuni Division.

The findings of the study are presented as per objectives of the study in the following sub-sections.

### 4.3 Current Status of Teaching and Learning of Agriculture Subject

The first objective of the study focused on the status of Agriculture education in secondary schools in Kakuyuni Division. This section is organized into four sections: 1) schools offering Agriculture as a subject, 2) student enrolment in Agriculture classes, 3) reasons for the choice of Agriculture among students and students' aspiration to take agriculture.

#### 4.3.1 Teaching of Agriculture in Schools

Teacher respondents were asked to indicate whether their schools offer Agriculture. The findings of the study were as presented in Table 4.4.

**Table 4.4 Teaching of Agriculture in Schools**

<b>Teaching Agriculture in Schools</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	10	100
No	0	0
<b>Total</b>	<b>10</b>	<b>100</b>

Table 4.4 shows that all the respondents 10 (100%) indicated that their schools teach Agriculture. This shows that Agriculture is a popular subject in secondary schools in Kakuyuni Division. The finding is supported by Ngesa (2006) who noted that while agriculture is an optional subject at the secondary school level in Kenya most public secondary schools teach the subject. The findings therefore reflect the importance of agriculture in the secondary schools curriculum.

### 4.3.2 Students Enrolment in Agriculture Classes

Teacher respondents were asked to indicate the students' enrolment in Agriculture class in form four. The fact that Agriculture and Business Studies subjects are in the same cluster; the researcher compared the number of students taking Agriculture as an option to those taking Business Studies. The findings were as presented in Table 4.5.

**Table 4.5 Students Enrolment in Agriculture Classes**

School		No. of	No. of Students		No. of Students	
		students in	Taking	%	Taking Business	%
		Form 4	Agriculture		Studies	
1	A	60	20	33	40	67
2	B	70	24	34	46	66
3	C	72	31	43	41	57
4	D	76	24	32	52	68
5	E	60	15	25	45	75
6	F	80	25	31	55	69
7	G	40	12	30	28	70
8	H	40	40	100	00	00
9	I	64	32	50	32	50
10	J	32	15	47	17	53
<b>Total</b>		<b>594</b>	<b>238</b>	<b>40</b>	<b>356</b>	<b>60</b>

The data in Table 4.5 shows that Agriculture attracted fewer students compared to Business Studies as evidenced by the fact that 356 (60%) of the students take Business studies compared to 238 (40%) who take Agriculture. From the findings of the study, it can be said that few students take Agriculture as an option compared to Business Studies.

This finding is in line with Ngesa (2006) who analyzed Comparative data on candidature by subjects in 2005 KSCE examination and found that agriculture at the secondary level attracts approximately 40% of the high school students. This is an indication that enrolment of students in Agriculture is one of the challenges facing teaching and learning of Agriculture in secondary schools in Kakuyuni Division.

### 4.3.3 Reasons for Choosing Agriculture among Students

Students were asked to indicate the reasons why they chose Agriculture. The findings were as presented in Table 4.6.

**Table 4.6 Reasons for Choosing Agriculture among Students**

<b>Reasons for choosing Agriculture</b>	<b>Frequency</b>	<b>Percentage</b>
Personal Interest	64	64
School Policy	4	4
Influence from parents and teachers	1	1
Students' Gender	7	7
Students' Performance	24	24
<b>Total</b>	<b>100</b>	<b>100</b>

Table 4.6 shows that 64 (64%) of the respondents chose Agriculture because of their personal interests in the subject. It also turned out that 1 (1%) indicated that they were influenced by their parents and teachers. From the findings of the study, it can be said that the major factors influencing students choice for Agriculture was the students'

personal interest in the subject and their performance. The findings are supported with the findings of a study done by Apori, Zinnah and Anor (2003) in reference to Ghana where they established that a students decision to choose agricultural science subjects was influenced by gender and socio-economic background of student, the level of knowledge about prospects in choosing agriculture as vocation, the terminal nature at agricultural colleges, where trainees are awarded certificates in agriculture, the influence of parents, guardians and peers who accord agriculture low recognition compared to other professions.

The students were further asked to mention other reasons why they chose Agriculture. All the students 100 (100%) mentioned that Agriculture was an applied subject and therefore they perceived it to have better career options.

#### **4.3.6 Aspiration to take Agriculture Oriented Careers**

The study sought to get students' views on taking agriculture oriented careers after secondary school. The findings of the study were as presented in Table 4.7.

**Table 4.7 Aspiration to take Agriculture Oriented Career**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	87	87
No	13	13
<b>Total</b>	<b>100</b>	<b>100</b>

Table 4.7 shows that 87 (87%) of the respondents indicated that they would consider taking Agriculture oriented careers after their secondary education while 13 (13%) would prefer other careers other than Agriculture oriented ones. From the findings of the study, it can be said that most of the students who took Agriculture as a subject had interest in Agriculture and wanted to pursue their career in Agricultural line. The findings are in line with the findings of a study done by Apori, Zinah and Annor (2003), who found that a students' decision to choose agriculture as a science subject is influenced by parents, guardians and peers who accord agriculture low recognition compared to other professions such as pharmacy, law, architecture, engineering, medicine and accounting.

The students were further asked to mention the reasons for their answers. Those who indicated that they would wish to pursue Agricultural related courses mentioned the following reasons: that Agriculture is a source of income and employment (55%) and that agriculture offer technical assistance to home farmers and avails daily consumable goods to the community (32%).

Those who indicated that they would not wish to pursue Agricultural related careers mentioned that that: agricultural related career had limited employment opportunities (3%), inadequacy of land for Agriculture (7%) and high poverty levels hindering the generating capital for Agricultural practice (3%) were mentioned.

#### 4.4 Institutional-based Challenges in Teaching and Learning of Agriculture

In establishing the institutional based challenges facing the teaching and learning of Agriculture in schools, the study tested on the adequacy of essential teaching resources in schools, methods of teaching Agriculture in schools, frequency of the use of different resources for teaching and learning Agriculture, level of understanding of different Agricultural topics and reasons for difficulty in understanding some topics.

##### 4.4.1 Challenges to Teaching and Learning of Agriculture

Teacher respondents were asked to indicate whether there were challenges facing teaching and learning of Agriculture in their schools. The findings of the study were as presented in Table 4.8.

**Table 4.8: Challenges to Teaching and Learning of Agriculture**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	9	90
No	1	10
<b>Total</b>	<b>10</b>	<b>100</b>

Table 4.8 shows that 9 (90%) of the respondents indicated that there were challenges facing teaching and learning of Agriculture in their schools while 1 (10%) indicated that they had no challenges. From the findings of the study, it can be said that teaching and learning of Agriculture in secondary schools in Kangundo district faced many challenges. The head teachers were further asked to give explanations for the answers they gave. The following were their responses: that there was inadequacy of Agriculture teachers,



inadequate resources for teaching and learning Agriculture, that some students had a negative attitude to cultivating in the farms, that some students who live in urban areas find it hard to cultivate their pieces of land for Agriculture practicals as it is their first time to farm and that there is inadequate rainfall discouraging agricultural practices.

#### 4.4.2 Availability and Adequacy of Agriculture Teaching Resources

To establish the adequacy of the teaching resources used at school, student respondents were asked to rate the level of adequacy of various teaching and learning resources used in school. The findings are as presented in Table 4.9.

**Table 4.9 Adequacy of the essential Teaching Resources**

Teaching Resources	Adequate		Inadequate		Not in usable condition		Not available		Total (%)	
	f	%	f	%	f	%	f	%	f	%
Teachers	72	72%	28	28%	0	0%	0	0%	<b>100</b>	<b>100%</b>
Textbooks	71	71%	28	28%	0	0%	1	1%	<b>100</b>	<b>100%</b>
School farm	38	38%	54	54%	6	6%	2	2%	<b>100</b>	<b>100%</b>
Agriculture tools	18	18%	53	53%	8	8%	21	21%	<b>100</b>	<b>100%</b>
Agriculture rooms/classes	33	33%	38	38%	1	1%	28	28%	<b>100</b>	<b>100%</b>
Livestock units and tools	8	8%	11	11%	3	3%	78	78%	<b>100</b>	<b>100%</b>
Agriculture Laboratory	9	9%	9	9%	4	4%	78	78%	<b>100</b>	<b>100%</b>

Results in Table 4.9 shows that teachers and textbooks are adequate as indicated by 72 (72%) and 71 (71%) respectively. The study also found that school farm, Agricultural tools and Agriculture classes were inadequate. The study further found that livestock units/tools and Agricultural laboratories were not available in most of the schools. From the findings of the study, it can be said that inadequacy of teaching and learning resources in secondary schools in Kakuyuni division poses a challenge to teaching and learning of Agriculture. The findings are in line with the findings of a study done by Giva (2006) who found that teachers are poorly equipped to deal with some of the challenges that the system poses such as the reality of large class size, unavailability of didactic materials and gender disparities.

#### **4.4.3 Subject Combination among Agriculture Teachers**

Teacher respondents were asked to indicate whether Agriculture was their major teaching subject. The findings of the study were as presented in Table 4.10.

**Table 4.10 Teaching Subjects among Teachers**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	9	90
No	1	10
<b>Total</b>	<b>10</b>	<b>100</b>

Table 4.10 shows that most of the respondents 9(90%) indicated that Agriculture was their major teaching subject while 1 (10%) indicated that Agriculture was not their major subject. This is an indication that most of the teachers interviewed majored in Agriculture and were therefore considered to be conversant with the subject and were therefore aware of the challenges facing the teaching and learning of Agriculture in schools.

#### 4.4.4 Head Teachers Opinion on In-service Training of Agriculture Teachers

Head teachers were asked of their opinions on in-service training of Agriculture teachers.

The findings of the study can be as presented in Table 4.11.

**Table 4.11: Head Teachers Opinion on In-service Training of Agriculture Teachers**

<b>Opinion on In-service</b>	<b>Frequencies</b>	<b>Percentages</b>
Very useful	9	90
Useful	1	10
<b>Total</b>	<b>10</b>	<b>100</b>

Table 4.11 shows that 9 (90%) of the respondents indicated that in-servicing among Agriculture teachers was very useful while 1 (10%) indicated that it was not useful. This pointed out the importance of teacher in service training in ensuring effective teaching in schools. The importance of in-service training was emphasized by the recommendation of GOK Report (1999) that in-service programmes should be regularly organized for teachers to improve their pedagogical skills in order to enhance quality.

#### 4.4.5 Teacher Workload

In testing on teachers' workload, they were asked to indicate the level of their agreement on the effect of their workload in terms of the number of lessons per week on their teaching strategies. The findings were as presented in Table 4.12.

**Table 4.12 Teacher Workload**

<b>Response</b>	<b>Frequency</b>	<b>percentage</b>
Strongly Agree	6	60
Agree	3	30
Disagree	1	10
Strongly Disagree	0	0
<b>Total</b>	<b>10</b>	<b>100</b>

Table 4.12 shows that 6 (60%) of the respondents strongly agreed that the workload affected their teaching strategies in that teachers could not get enough time to incorporate other teaching methods which were necessary for the teaching and learning of Agriculture. The study also found that 3 (30%) of the respondents agreed that the workload affected their teaching strategies and 1 (10%) disagreed that that the workload affected their teaching strategies. From the findings of the study, it can be said that teacher workload affected teaching and leaning of Agriculture in secondary schools.

#### **4.4.6 Relevance of Agriculture Content**

Teacher respondents were asked to indicate whether Agriculture content was relevant in building students' Agricultural knowledge at their level and practical. The findings were as presented in Table 4.13.

**Table 4.13 Relevance of Agriculture Content**

<b>Relevance of Agriculture content</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	6	60
No	4	40
<b>Total</b>	<b>10</b>	<b>100</b>

Table 4.13 shows that 6 (60%) of the respondents agreed that the content of Agriculture syllabus was relevant and practical while 4 (40%) indicated that the content of Agriculture was irrelevant.

Those who indicated that the content of Agriculture was irrelevant were further asked to give the reasons for their answer. The following topics were mentioned to be irrelevant: biotechnology and placing and budgeting. The reasons were that biotechnology in form two syllabus was above their level of understanding. Mwangi (2010) stated that for effective teaching and learning of agriculture in secondary schools, there is need to review and probably, overhaul the syllabus to accommodate emerging issues in modern day economies that Kenya proudly finds itself in over the years and put them in the right level of learning in the curriculum. This supports the fact that some of the topics need to be reviewed and transferred to the right level.

#### **4.4.7 Methods of Teaching Agriculture in Schools**

Teacher respondents were asked to indicate the methods they use in teaching Agriculture in their schools. The findings of the study were as presented in Table 4.14.

**Table 4.14 Methods of Teaching Agriculture in Schools**

<b>Teaching Method</b>	<b>Frequency</b>	<b>Percentage</b>
Lecture	8	80
Group work	7	70
Demonstration	5	50
Practical	3	30
Assignment	6	60
Field visits	2	20
Projects	1	10

The results on Table 4.14 shows that 8 (80%) of teachers indicated that lecture method was commonly used. The study also found that group work was frequently used as indicated by 70% of the respondents. The use of projects 1 (10%) was least used. From the findings of the study, lecture method was commonly used by teachers to teach Agriculture. The findings are in line with the findings of a study by Vandebosch (2006) who found that most used strategies in teaching agriculture are, lectures, demonstrations, discussion, educational visits, projects, question and answers, assignments and practical. Fauziah (2008) review on pedagogy and classroom practices revealed that the teacher-centred and student centred teaching methods are basic to most theoretical and teaching propositions. Ngesa (2006) further confirms the findings by mentioning that Agriculture teacher teachers in Kenya use lecture, class discussion and group discussion methods.

#### 4.4.8 Use of Different Resources for Teaching and Learning Agriculture

To find out the resources most commonly used in teaching and learning Agriculture, the students were asked to indicate the frequency of the use of different resources. The findings of the study were as shown in Table 4.15.

**Table 4.15 Use of Different Resources for Teaching and Learning Agriculture**

Types of teaching / learning resources	Most frequent		Frequently		Rarely or never		Total	
	f	%	F	%	f	%	f	%
Chalk and chalk board	68	68	29	29	3	3	100	100
School farm	17	17	61	61	22	22	100	100
Laboratory	13	13	22	22	65	65	100	100
Computers	4	4	8	8	88	88	100	100
Resource persons	21	21	22	22	57	57	100	100
Text books	54	54	43	43	3	3	100	100
Models	20	20	20	20	60	60	100	100
Visual aids	14	14	14	14	72	72	100	100

Table 4.15 shows that that chalk board and text books were most frequently used as indicated by 68 (68%) and 54 (54%) respectively. The study also found that school farm was frequently used as indicated by 61% of the respondents. It also turned out that resources such as laboratory, computers, resources persons, models and visual aids were rarely or never used.

#### 4.4.9 Level of Understanding of Different Agricultural Topics

In testing the level of students' understanding of different topics, the student respondents were asked to indicate the level of difficulty of given Agricultural topics. This was tested on a four point likert scale of 1-4; where 1 represented 'Easy', 2 represented 'Average', 3 represented 'Difficult' and 4 represented 'Very Difficult'.

The scores 'Easy' was taken to be equivalent to mean score ranging from 0.0 to 1.0, 'Average' with mean score ranging from 1.1 to 2.0, 'Difficult' with a mean score ranging from 2.1 to 3.0 and 'Very Difficult' with a means score ranging from 3.1 to 4.0. A standard deviation of  $> 1$  represented a significant difference in the responses given. The results were as presented in the Table 4.16.

**Table 4.16 Level of Understanding of Different Agricultural Topics**

	<b>Number</b>	<b>Mean</b>	<b>Standard Deviation</b>
Soil science and fertilizer	100	1.74	.645
Crop production	100	1.33	.514
Livestock production	100	1.63	.706
Agriculture Economics	100	2.33	.877
Farm Power and Machineries	100	2.44	.935
Water Conservation, Supply and Irrigation	100	1.41	.653
Farm practices	100	1.51	.732

Table 4.9 shows that soil science and fertilizer, crop production, livestock production, water conservation, supply and irrigation and farm practices were average (mean score ranging between 1.1-2.0). The study also found that Agriculture economics and farm



power and machinery were difficult (Mean score of 2.33 and 2.44 respectively). There was no significant difference on the response given (standard deviation < 1).

#### 4.4.10 Reasons for Difficulty in Different Topics

The student respondents were further asked to indicate the reasons why they perceived some topics to be difficult. The findings were as presented in Table 4.17.

**Table 4.17 Reasons for Difficulty in Different Topics**

<b>Reasons for Difficulty in different Topics</b>	<b>Frequency</b>	<b>Percentage</b>
Learners are not interested	7	7
Low ability to understand	30	30
Inadequate text books	15	15
None availability for learning materials	19	19
Very little practical work	19	19
No practical work done	10	10

Table 4.17 shows that the major reasons why some topics were perceived to be difficult was low understanding ability as indicated by 30 (30%) of the respondents. Other reasons included: lack of learning materials, very little practical work, inadequate text books, inadequate practical work and lack of interest among learners.

#### 4.4.11 Nature of Punishment in Schools

Students were asked to indicate whether their teachers send them to weed flowers or dig as a punishment. The findings of the study were as presented in Table 4.18.

**Table 4.18 Nature of Punishment in Schools**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	78	78
No	22	22
<b>Total</b>	<b>100</b>	<b>100</b>

Table 4.18 shows that 78 (78%) of the respondents indicated that they were given such punishment while 22 (22%) indicated that they were not given such punishments. From the findings of the study, it can be said that punishment methods such as digging or weeding in schools affected students attitude towards Agriculture. The findings are in line with Bergman (1980) who found that in many schools, students are sent to work on the school farm as a punishment which is bound to create a negative attitude to farm work rather than fostering positive attitude towards the subject.

The respondents who indicated that they were given punishments to dig or to weed flowers were further asked to indicate the frequency with which they were given such punishments. The findings of the study were as presented in Table 4.19.

**Table 4.19 Frequency of Punishment**

<b>Frequency of Punishment</b>	<b>Frequency</b>	<b>Percentage</b>
Very often	13	17
Often	27	35
Rarely	38	48
<b>Total</b>	<b>78</b>	<b>100</b>

Table 4.19 shows that that 38 (48%) of the respondents indicated that they were rarely punished. The study also found that 27 (35%) indicated that they were often punished and 17% indicated that they were given such punishments very often.

#### **4.5 Non-institutional Challenges in Teaching and Learning of Agriculture**

In this section, the researcher sought to establish whether respondents practiced agriculture at home, the scale of agricultural practice and also to identify factors that hinder Agricultural practice at home.

##### **4.5.1 Agricultural Practices at Home**

Student respondents were asked to indicate whether they practiced Agriculture at home. The findings were as presented in Table 4.20.

**Table 4.20 Agricultural Practices at Home**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	68	68
No	34	34
<b>Total</b>	<b>100</b>	<b>100</b>

Table 4.20 shows that 68 (68%) of the student population practice Agriculture at home while only 34 (34%) do not practice Agriculture at their homes. This shows that Agriculture was a major economic activity in Kakuyuni division.

#### 4.5.2 Scale of Agricultural Practice at Home

In establishing the scale of farming done at home, students were asked to indicate the scale of farming practiced in their homes. The findings of the study were as shown in Table 4.21.

**Table 4.21 Scale of Agricultural Practice at Home**

<b>Scale of Agricultural Practice at Home</b>	<b>Frequency</b>	<b>Percentage</b>
Large	2	2
Subsistence	70	70
Small	28	28
<b>Total</b>	<b>100</b>	<b>100</b>

Table 4.21 shows that 28(62%) practice subsistence farming while 2 (2%) practiced large scale farming. The findings therefore reveals that even though Agriculture is practiced in Kakuyuni division, it is majorly done for subsistence purposes an indication of availability of challenges to teaching Agriculture in the division.

#### 4.5.3 Relevance of Agriculture Curriculum to the Arid and Semi-arid Areas

Teacher respondents were asked to indicate the extent to which Agricultural curriculum was relevant to the arid and semi arid areas. The findings of the study were as presented in Table 4.22.

**Table 4.22 Relevance of Agriculture Curriculum to the Arid and Semi-arid Areas**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Very relevant	1	10
Relevant	2	20
Less relevant	6	60
Not relevant at all	1	10
<b>Total</b>	<b>10</b>	<b>100</b>

Table 4.22 shows that 6 (60%) of the respondents indicated that Agriculture was less relevant in Arid and Semi-arid areas. The study also found that 1 (10%) indicated that Agriculture was no relevant at all. This is an indication that the nature of the area of study influenced teaching and learning of Agriculture as the area was not so favourable for Agricultural production.

#### **4.5.5 Factors Hindering proper Agricultural Practice.**

Respondents were asked to indicate the factors that hinder effective agricultural practice in their locality. The Findings of the study were as shown in Table 4.23.

**Table 4.23 Factors Hindering proper Agricultural Practice**

<b>Factors</b>	<b>Frequency</b>	<b>Percentage</b>
Unreliable Rainfall	64	64
Lack of interest	4	4
High poverty level factors	18	18
Dependency on relief food	3	3
White collar jobs	11	11
<b>Total</b>	<b>100</b>	<b>100</b>

Table 4.23 shows that unreliable rainfall was the major hindrance as indicated by 64 (64%). The study also found that high poverty levels hinder Agricultural practices as indicated by 18 (18%) of the respondents. This is because it affects the ability of the farmers to purchase Agricultural inputs. Dependence on relief food and availability of white collar jobs was rated the least.

#### 4.5.6 Factors Hindering Agricultural practice at Home

The respondents were asked to indicate the factors hindering Agricultural practice at home. This is as shown in the Table 4.24.

**Table 4.24 Factors Hindering Agricultural practice at Home**

<b>Factors</b>	<b>Frequency</b>	<b>Percentage</b>
Lack of Land and unreliable rainfall	40	40
Lack of economic power	35	35
Residing in urban areas	15	15
Agriculture is regarded as a hard manual labour	10	10
<b>Total</b>	<b>100</b>	<b>100</b>

Table 4.24 shows that 45(45%) of the respondents indicated that lack of land and unreliable rainfall to be the major factors hindering Agriculture at home. On the other hand, 10 (10%) indicated that they regard Agriculture as hard manual labour thus hindering Agricultural practice. From the findings of the study, factors such lack of land, unreliable rainfall and inadequate economic power are factors hindering Agricultural practice at home. These findings are in line with the findings of Oluwole (1987) who

found that inadequate economic power, unreliable rainfall and the actual hard work involved in manual labour and its rewards affects Agricultural practice.

In an interview with the head teachers on the challenges facing teaching and learning of Agriculture in the arid and semi-Arid areas, the following responses were given: that Agricultural practices are difficult to carry out due to unreliable rainfall and the topography of the land does not promote Agricultural practices.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

The purpose of the study was to establish the challenges facing teaching and learning of Agriculture in secondary schools in Kakuyuni division, Kangundo district. The study was guided by the following Specific objectives: to find out the current status in teaching and learning of agriculture subject in a semi-arid region, to establish the institutional-based challenges in teaching and learning of agriculture in semi-arid regions and to determine the non-institutional challenges in teaching and learning of agriculture in secondary schools in semi-arid regions.

#### **5.2 Summary of Findings**

This section presents the summary of the findings of the study as per the objectives of the study.

##### **5.2.1 Current Status of Teaching and Learning of Agriculture Subject**

On the status of teaching and learning Agriculture in secondary schools in Kakuyuni Division, it was found that all schools (100%) studied teach Agriculture as a subject. The study found that that Agriculture attracted less students compared to Business Studies. The major reasons for the choice of Agriculture were students' personal interests as indicated by 64 (64%) and performance in the subject as indicated by 24 (24%) of the students who took Agriculture. The study further found that 87 (87%) of the students' indicated that they would consider taking Agriculture related careers. This was because



they considered Agriculture as an applied subject and therefore they perceived it to have better career options

### **5.2.2 Institutional-based Challenges in Teaching and Learning of Agriculture**

Regarding the institutional based challenges, the study found that inadequacy of resources such as school farms, Agricultural tools and Agriculture class rooms posed challenges to teaching and learning of Agriculture. Some topics such as Agriculture economic, farm power and machineries seemed very difficult to the learners. The study further found that teacher workload affected the effectiveness of teaching and learning Agriculture as indicated by 6 (60%) of the teacher respondents. The study finally found that the nature of punishments given to students such as weeding flowers affected their attitude towards learning Agriculture as evidenced by 78 (78%) of the student respondents.

### **5.2.3 Non-institutional Challenges in Teaching and Learning of Agriculture**

On the non-institutional challenges, the study found that unreliable rainfall as indicated by 64 (64%) and high poverty levels as indicated by 18 (18%) affected teaching and learning Agriculture in schools. Other factors included inadequate Agricultural land, the fact that some students come from urban areas, nature of the surrounding area was considered as semi arid which hinders Agricultural practice

### **5.3 Conclusions**

From the findings of the study, it can be concluded that Agriculture as an examinable subject is widely offered in secondary schools in Kakuyuni Division offer Agriculture as teaching and examinable subject and that students enroll for the Agriculture classes.

From the study, it can also be concluded that the institutional based challenges facing teaching of Agriculture in schools include inadequacy of resources such as school farm, Agricultural tools and Agriculture classes, difficulty in some topics. Other institutional challenges included teacher workload and Agricultural related punishments given to students' which affects their attitude towards the subject.

The study finally concluded that the non institutional challenges facing teaching and learning Agriculture include: unreliable rainfall, high poverty levels, inadequate Agricultural land, the fact that some students come from urban areas, Agriculture being regarded as hard manual labour thus few students take it, and nature of the surrounding areas being Arid.

### **5.4 Recommendations**

From the findings of the study, it can be recommended that schools should ensure that their environment is favorable for agriculture subject by ensuring that there are adequate class rooms and land for practical Agriculture. This will encourage students to take Agriculture subject.

The study also recommends that teachers should ensure that they handle agriculture as a subject in such a way that will encourage students to take the subject. This can be achieved by ensuring that they teach practical lessons in the laboratory and the school farm. It was also recommended that Government should employ more teachers and provide resources for teaching and learning Agriculture in schools teaching resources like land, equipment and laboratories.

The study finally recommended that students should be encouraged to take Agriculture as a subject besides the nature of the surroundings areas which are perceived to be arid and semi-arid areas. This is due to the fact that there are Agricultural practices which suit such areas and that the use of technology can also allow meaningful Agricultural practices to be carried out in such areas.

### **5.5 Recommendations for Further Research**

This study was carried out in secondary schools in Kakuyuni Division. The researcher therefore recommends that another study be done in other districts to assess students' performance in Agriculture which was not a concern of this study.

It is also recommended that another study be done to determine the teacher preparedness for teaching Agriculture in Secondary schools.

The study finally recommends that another study be done to find out the preparedness of the schools to implement Agricultural curriculum.

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## APPENDIX I: QUESTIONNAIRE FOR HEAD TEACHERS.

You are kindly asked to answer the questions in this questionnaire accurately. Do not give your name. You are further assured that your identity shall not be divulged to anyone whatsoever. This information shall be treated with confidentiality and be used purely for academic purposes. Answer the questions accordingly.

Put a tick (✓) against the appropriate statement

1. Does your school offer Agriculture subject

(a) Yes ( )

(b) No ( )

2. What is the total student enrolment of agriculture class in form four?

(a) Above 70 students ( )

(b) Between 50 and 70 ( )

(c) Between 30 and 54 ( )

(d) Below 30 ( )

3. What is the qualification of agriculture teacher in your schools?

(a) Degree in agriculture ( )

(b) Degree in agriculture but not training as a teacher ( )

(c) Diploma in agriculture education ( )

(d) Diploma in agriculture with no training as a teacher ( )

(e) Masters ( )

(f) Any other ( specify) \_\_\_\_\_

4. What determines the selection of agriculture students in form three

(a) Student interest ( )

(b) Student performance ( )

(c) Teacher's influence ( )

(d) School policy ( )

(e) Gender ( )

5. How would you rate the adequacy of essential teaching resources in your school put a tick (√) where appropriate

Resources	Adequate	Inadequate	Not in usable condition	Not available
Teachers				
Text books				
School farm				
Agriculture tools				
Agriculture room/class				
Computers				
Livestock units and tools				
Agriculture laboratory				
Any other (specify)				

6. (a) Are there any challenges facing the teaching and learning of agriculture in your school

Yes ( )

No ( )

(b) If yes briefly explain your answer in 8(a) above

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7. (a) Does the school management support the professional development courses of agriculture teachers e.g. through in service, seminars, fieldtrips, ASK shows e.t.c

Yes ( )

No ( )

(b) If yes how often

Termly ( )

Yearly ( )

After two years ( )

Others (specify) \_\_\_\_\_

8. What is your opinion about the professional development courses?

(a) Very useful ( )

(b) Useful ( )

(c) Not useful ( )

9. Briefly explain how teaching and learning of Agriculture is affected by ASAL weather conditions.

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10. In your opinion what can be done to improve the teaching and learning of Agriculture in your school

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## APPENDIX II QUESTIONNAIRE FOR TEACHERS

You are kindly asked to answer the questions in this questionnaire accurately. Do not give your name. You are further assured that your identity shall not be divulged to anyone whatsoever. This information shall be treated with confidentiality and be used purely for academic purposes. Answer the questions accordingly.

Put a tick (✓) against the appropriate statement

1. Indicate your gender

Male ( )

Female ( )

2. Your qualifications

(a) Degree in agriculture education ( )

(b) Degree in agriculture but not training as a teacher ( )

(c) Diploma in agriculture education ( )

(d) Diploma in agriculture with no training as a teacher ( )

(e) Masters

(f) Any other (specify)\_\_\_\_\_

3. Teaching experience

(a) 0 -5 years ( )

(b) 6 – 10 years ( )

(c) 11 – 15 years ( )

(d) 16 and above ( )

4. Work load per week \_\_\_\_\_

5. Enrolment of agriculture class in form four

(a) Above 70 students ( )

(b) Between 50 and 70 ( )

(c) Between 30 and 54 ( )

(d) Below 30 ( )

6. What determines the selection of agriculture students in form three

(a) Student interest ( )

(b) Student performance ( )

(c) Teacher's influence ( )

(d) School policy ( )

(e) Gender ( )

7. How would you rate the adequacy of essential teaching resources in your school  
 put a tick (✓) where appropriate

Resources	Adequate	Inadequate	Not in usable condition	Not available
Teachers				
Text books				
School farm				
Agriculture tools				
Agriculture room/class				
Computers				
Livestock units and tools				
Agriculture laboratory				
Any other (specify)				

8. (a) Are there any challenges facing the teaching and learning of agriculture in your school

Yes ( )

No ( )



(b) If yes briefly explain your answer in 8(a) above

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9. (a) Does the school management support the professional development courses of agriculture teachers e.g. through in service, seminars, fieldtrips, ASK shows e.t.c

Yes ( )

No ( )

(b) If yes how often

Termly ( )

Yearly ( )

After two years ( )

Others (specify) \_\_\_\_\_

(c) What is your opinion about the professional development courses?

a) Very useful ( )

b) Useful ( )

c) Not useful ( )

10. Briefly explain how teaching and learning of Agriculture is affected by ASAL weather conditions.

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11. (a) Is Agriculture content relevant and practical to the level of learners

Yes ( )

No ( )

(b) If no, which content do you find irrelevant and why?

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12. How is the coverage of agriculture syllabus

(a) Good ( )

(b) Average ( )

(c) Poor ( )

13. If the coverage of the syllabus is good which one of the following reasons accounts for this

- (a) Teachers plan their work well ( )
- (b) Students are fast in understanding ( )
- (c) Availability of teaching learning resources ( )

14. If the coverage of the syllabus is poor, which one of the following reasons accounts for this

- (a) Teachers do not plan their work well ( )
- (b) Students are slow in understanding ( )
- (c) The syllabus is too wide for the time available ( )
- (d) Classes are overcrowded ( )
- (e) All the above ( )

15. Do you punish students by giving them Agriculture related work in the field?

- (a) Yes ( )
- (b) No ( )

Which among the following methods of teaching is frequently used by your Agriculture teacher?

- (a) Lecture ( )

- (b) Practical ( )
- (c) Demonstrations ( )
- (d) Group work ( )
- (e) Assignments ( )
- (f) Field visits ( )
- (g) Projects ( )

16. In your opinion what can be done to improve the teaching and learning of Agriculture in your school

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17. Is agriculture your major teaching subject?

- a) Yes ( )
- b) No ( )

18. To what extent is the agriculture syllabus relevant to the semi arid region?

- a) Very relevant ( )
- b) Relevant ( )
- c) Less relevant ( )
- d) Not relevant at all ( )

## APPENDIX III

### TEACHERS ATTITUDE SCALE

1. Tick (√) your right opinion against this statement.

Opinion	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
Agriculture is the simplest and most basic among the science subjects					
Agriculture subject is effective to students of differing abilities and levels					
Agriculture subjects is best suited for boys than girls					
High school agriculture prepares students for college and employment					
Parents and teachers encourage learners to pursue careers or professional pursuit in agriculture					
I find Agriculture content appropriate to the learners					
To increase learners' interest in Agriculture lesson I, employ varied teaching and learning approaches such as field trips, resources persons, practical and projects.					
Teaching and learning resource in agriculture are available					
The climatic conditions in my school doesn't affect the teaching/ learning of Agriculture					
Students in form three willingly choose/selects Agriculture for K.C.S.E					
I am motivated by my student performance in Agriculture.					
My Agriculture classes are manageable in terms of class size and enrolment.					
The agriculture syllabus is manageable					
My workload in terms of No. of lesson per week doesn't affect my teaching strategies.					

## APPENDIX IV

### QUESTIONNAIRE FOR STUDENTS

You are kindly asked to answer questions in this questionnaire honestly and accurately. Please note that there are no correct or wrong answers. Do not give your name. Your answers will be treated with confidentiality. Answer each question according to the instructions given. Put a tick against the appropriate answer (√).

1. Indicate your gender

Male ( )

Female ( )

2. (i) Do you practice agriculture at home

Yes ( )

No ( )

(ii) If yes How?

(a) Large scale farming ( )

(b) Small scale farming ( )

(c) Subsistence only ( )

(iii) If no why?

(a) We have no land ( )

(b) We don't value agriculture at home ( )

(c) Lack of economic power to purchase certified seed and inputs ( )

- (d) I come from an urban area ( )
3. What hinders proper Agricultural practices in your locality?
- (a) Unreliable rainfall ( )
- (b) Lack of interest of farming in the community ( )
- (c) High levels of poverty ( )
- (d) Over dependency on relief food from the government ( )
- (e) Preference for white collar jobs in urban areas ( )
4. Why did you choose agriculture in form three?
- (a) Personal interest ( )
- (b) School policy ( )
- (c) Parents and teacher's influence ( )
- (d) Gender ( )
- (e) Performance in Agriculture ( )
- (f) Others (specify ) \_\_\_\_\_
-

5. For the agriculture topics given below, indicate the degree of your understanding for each of them by putting a tick ( ✓ ) in the appropriate column

<b>Topic</b>	<b>Easy</b>	<b>Average</b>	<b>Difficult</b>	<b>Very difficult</b>	<b>Not covered</b>
(a) Soil science and fertilizer					
(b) Crop production					
(c) Livestock production					
(d) Agriculture Economics					
(e) Farm Power and Machineries					
(f) Water Conservation, Supply and Irrigation					
(g) Farm practices					

6. For the topics you find very difficult or difficult in question 6 above, why do you find them so?

- (a) You are simply not interested in those topic areas ( )
- (b) Your ability to understand is low ( )
- (c) Text books are not available ( )
- (d) Textbooks are not enough ( )
- (e) Other learning materials are not available ( )
- (f) Very little practical work is done ( )
- (g) No practical work done ( )



7. The table below shows type and frequency of using teaching learning resources in Agriculture in your school. Tick appropriately.

Types of teaching / learning resources			
	Most frequent	Commonly	Rarely or never
Chalk & chalk board			
School farm			
Laboratory			
Computers			
Resource persons			
Text books			
Models			
Visual aids			

8. (a) Do you find agriculture relevant to yourself and the community?

Yes ( )

No ( )

(b) If No explain \_\_\_\_\_

\_\_\_\_\_

(c) If yes how relevant \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. How would you rate the adequacy of essential teaching resources in your school?

Please put a tick (√) where appropriate.

Resources	Adequate	Inadequate	Not in usable condition	Not available
Teachers				
Textbooks				
School farm				
Agriculture tools				
Agriculture rooms/class				
Computers				
Livestock units & tools				
Agriculture laboratory				
Any other specify				

10. What motivates you to continue learning agriculture?

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11. Does your teacher send you to dig or weed flowers as a punishment in the school

farm? a) Yes ( )

b) No ( )

12. If you are given such punishments, how often are they?

(a) Very often ( )

(b) Often ( )

(c) Rarely ( )

13. (a) Do you consider taking Agriculture oriented career after your secondary education

Yes ( ) No ( )

(b) If yes, indicate why? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(c) If No, why? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## APPENDIX V

### STUDENTS ATTITUDE SCALE

1. Tick (√) your right opinion against this statement.

Opinion	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
Agriculture is the simplest and most basic among the science subjects					
Agriculture subject is effective to students of differing abilities and levels					
Agriculture subjects is best suited for boys than girls					
High school agriculture prepares students for college and employment					
Parents and teachers encourage learners to pursue careers or professional pursuit in agriculture					
I find Agriculture content appropriate to the learners					

To increase learners' interest in Agriculture lesson I, employ varied teaching and learning approaches such as field trips, resources persons, practical and projects.					
Teaching and learning resource in agriculture are available					
The climatic conditions in my school doesn't affect the teaching/ learning of Agriculture					
Students in form three willingly choose/selects Agriculture for K.C.S.E					
I am motivated by my performance in Agriculture.					

## APPENDIX VI

### OBSERVATION CHECKLIST

Name of school: \_\_\_\_\_

Type of Resource	Available	Not available
Agriculture teachers		
Land		
Text books		
Models		
Chalk & chalk board		
Farm tools and equipments		
Film strips		
Farm machineries		
Livestock production tools		
Computers		
Laboratory ( Agriculture)		
Classroom (Agriculture room)		
Livestock units		