INFLUENCE OF ENVIRONMENTAL CLUBS ON PUPILS' ENVIRONMENTAL AWARENESS: A STUDY OF PRIMARY SCHOOLS IN MWEA DIVISION, EMBU COUNTY, KENYA

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DECLARATION

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

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We confirm that the work reported in this thesis was carried out by the candidate under our supervision as university supervisors.

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To God for His faithfulness, love and kindness and to my dear wife Joyce, and daughter Prudence for their moral support and encouragement

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ABBREVIATIONS AND ACRONYMS

AIDS: Acquired Immune Deficiency Syndrome

EE: Environmental Education

CVI: Content Validity Index

GoK: Government of Kenya

HIV: Human Immunodeficiency Virus

4K: *Kuungana Kufanya Kusaidia Kenya* (Coming together and working to help Kenya)

KCPE: Kenya Certificate of Primary Education

KICD: Kenya Institute of Curriculum Development

KNBS: Kenya National Bureau of Statistics

KSA: Kenya Scouting Association

NCEOP: National Committee on Education Objectives and Policies

SSP: School Science Project

UNCHE: United Nations Conference on the Human Environment

UNDP: United Nations Development Programme

UNEP: United Nation Environmental Programme

UNESCO: United Nations Educational, Scientific and Cultural Organisation

UN-HABITAT: United Nations Human Settlements Programme

UNICEF: United Nations Children's Fund

WCED: World Conference on Environment and Development

DEFINITION OF TERMS

Formal environmental education: This is hierarchically structured full-time technical and professional training often guided by curriculum framework and is based on education standards and is tested using summary evaluation at the end of the course.

Non-formal environmental education: This is an organized educational activity outside the formal curriculum. It can occur anywhere as long as pupils are interested in learning. It is education in which participation is voluntary. For the purpose of this study environmental clubs are considered as non-formal environmental education programmes which offer experiential form of learning.

Environmental awareness: Refers to the following three components in this study; environmental knowledge, environmental attitude and taking action for environment protection

Environmental knowledge: Refers to level of information acquired by a person concerning nature, about trends and development in environmentally related issues.

Environmental attitudes: Refers to normative orientations and willingness to act for the environment.

Environmental actions: Refers to simple steps that are reflected in everyday behaviours towards the environment.

Environmental clubs: Organisations established to help learners acquire skills needed to identify, investigate, and experience the resolution of environmental issues and problems. The terms environmental education programmes, experiential learning, outdoor learning and non-formal environmental learning programmes were used to describe environmental clubs.

Gender: The difference between boys and girls that is socially determined and constructed.

Green class model: An applied environmental education project comprising of active learning methods and techniques.

ABSTRACT

Environmental awareness is one of the goals of environmental education. Insufficient environmental awareness aggravates the problem of environmental degradation. Environmental clubs in primary schools are voluntary groups that promote participation of learners in learning about and working towards conservation and sustainability of the environment. The study on influence of environmental clubs on environmental awareness of pupils was carried out in Mbeere South Sub-County, Embu County. The study investigated environmental knowledge, environmental attitude and taking action for environmental protection as components of environmental awareness. The study objectives were to establish whether environmental clubs members possessed different environmental knowledge, environmental attitudes and taking action for environmental protection when compared to non-environmental club members. Data were collected from a sample of 250 randomly selected respondents by use of questionnaires. The club patrons were interviewed to give information about how the clubs were organised and the activities learners engaged in their respective schools. The data collected were presented in form of tables and graphs. It was analysed using percentages, t-test and Chi-square. On club affiliation and environmental knowledge difference, the study found a t-value of 3.66 which was higher than t-value at $p \geq 0.05$. The study concluded that club members and non-club members had different environmental knowledge abilities. On gender affiliation and environmental knowledge, the t-value obtained was 0.07219 which was below the t-value at $p \geq 0.05$. The study concluded that gender had no influence on environmental knowledge of respondents. Respondents were exposed to attitudinal questions which were analysed using Chi-square. The chi-square values obtained were 18.452, 8.755, 8.838, 87.718 and 55.517. More than half of the chi-square values obtained were above 9.488, the chi-square value at $p \geq 0.05$. The study concluded that participating in environmental clubs had influence on environmental attitudes of the respondents. The chi-square results obtained when respondents were categorised by gender were 0.071, 10.542, 3.197, 4.125 and 9.077of which four values obtained were below Chi-square value at $p \geq 0.05$. The study concluded that gender had no influence on environmental attitude of respondents. Club affiliation was analysed against taking action for environmental protection and the percentages obtained for club members against non-club members respectively were; 63% against 37%, 56 % against 44%, 52% against 48% and 55% against 45% on the four areas tested. Club members had a higher participation than non-club members. On gender and participation the percentages obtained for boys against girls were; 35% against 65%, 39% against 61%, 37% against 63%, and 53% against 47% leading to a conclusion that girls participated in activities geared towards environmental protection more than boys in the study area. The study concluded that environmental clubs are important tools for environmental awareness creation since they offer interactive teaching pedagogies that enhance active teaching and learning of environmental education concepts obtained from class. The study recommends that environmental education be taught both theoretically in class and practically in the field. This will elevate learners' role as informed decision-makers and action-takers in an effort to improve environmental awareness and thereby reducing environmental degradation.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Environmental problems have immensely increased globally, regionally and at local level during the last few decades. Issues related to environmental problems have become a major concern for the international community, particularly for educational policy makers and curriculum developers. As awareness on environmental problems increases globally, school environmental education programmes are also becoming increasingly widespread. Studies have indicated that teachers and pupils in many parts of the world are addressing outcomes relevant to environmental education (EE) and that pupils in many schools are vigorously involved in local environmental projects. Experiences such as planting trees, collecting information and taking positive action in the local environment are integrated into these programmes and pupils report having learned new information, skills, attitudes and approaches to environmental problems. Pupils in many schools are vigorously involved in local environmental projects (Mwangangi, 2012). Korir (1987) contends that without EE people will continue to mismanage and destroy the environment on which their existence depends. EE therefore should aim at raising pupils‟ environmental awareness and instilling positive environmental values.

Connecting children to nature assists in the development of a sense of place, which is a fundamental basis for ecological identity formation in people. A sense of place is a factor in developing eco-literacy and the formation of lifelong responsibility and caring for the environment (Pelo, 2013). Powers (2004) working model for theoretical change in place-based education contends that a child must have a clear understanding of place (knowledge and experience) before they become attached to that place (attitude). Once this occurs, Powers contends that children become more publicly engaged (take actions) and the community environment benefit from their involvement.

Environmental education comprises of education programmes that focuses on creating awareness and modifying learners' behaviour towards preservation and conservation of the physical environment. Environmental education programmes aim at developing environmental knowledge, skills and awareness about the natural resources and their

management. According to United Nations Educational, Scientific and Cultural Organisation (UNESCO) conservation education should be incorporated into primary schools subjects and also in science and geography curricula of secondary schools (UNESCO, 1977). Environmental education focuses on the importance of the public's better understanding of natural resources importance to the society, and developing citizen support for sound natural resource preservation and conservation and management programmes.

The need to make environmental education processes an integral part of both the formal and non-formal curricula in Kenya were made explicit in Sessional Paper No. 6 of 1988 (GoK, 1988), but little was done at classroom level, beyond a discipline-based approach to the teaching of environmental education processes. Since 8-4-4 system is more examinations' oriented and not conducive to developing talent, failure in examinations normally spell doom to learners who feel their dreams were shattered when they scored below average marks. The 8-4-4 system has failed in some measures to produce an all rounded individuals. It only increased workload for both learners and teachers (Karembu, 2002). This left little room for socially critical approaches to environmental education processes. The school curriculum thus appears not to have sufficient and effective implementation so as to take account of the complex, interdisciplinary character of environmental education processes. Animatedly, the education processes have become part of the dilemma confronting the teaching of environmental education processes in Kenya as elsewhere (Hopkins and Mckeown, 2002).

To take account for the complex nature of environmental education processes, environmental clubs are offered as co-curricular activities in schools to provide an experiential form of learning which supports the formal education practices which are still "top down" and authoritarian in implementation. Environmental clubs therefore provide learners with an opportunity to experience physical environment. Bakers (2008) found that learners who took part in co-curricular activities during college life were more academically successful than those who did not. Robyn (2008), found learners who participated in peer support programmes developed valuable skills and attributes. Botma (2000), found a relationship between environmental clubs and schools where

academically weak learners became more noticeable as they exposed their aptitude. Svedbom (2000) found environmental clubs develop a sense of resilience and coherence in the face of problems and risks that adolescents face as they prepare for adulthood so that they feel their lives are manageable and meaningful.

Although environmental education content is infused in the formal education system through an interdisciplinary approach across the primary and secondary education system in Kenya it has not produced an environmentally literate society because most of what is taught in primary school is theoretical. Thus it would be unfeasible to expect learners to become environmentally literate without relevant exposure to environmental knowledge and skills which foster competence to participate in day to day management of their environment. It is through environmental clubs that learners are introduced to practical bit through exposure to actual ecological environment. Environmental clubs are therefore an avenue that complete the formal education offered by the schooling system by involving community activities into the curriculum and thus, the goals of environmental education would be to instill in learners knowledge for the environment, positive attitudes toward the environment, competency in citizen action skills, and a sense of empowerment (Ruto, 2004).

1.2 Statement of the Problem

Environmental education aims at spreading environmental awareness to learners. The Kenyan primary education system is centralized with a single uniform examination process. Concerns have been raised on tests learners undertake at the expense of actual learning and participation in out of class activities (KICD, 2010). Out of class experiences that supplement in class curriculum increases positive exposure to natural environments and help children assimilate new ideas into their existing base of knowledge (Kellert, 2005). The out of class experience increases the capacity for affective development. Hands-on learning approach raises interest and awareness of environmental issues to many children and therefore, a greater emphasis should be placed on outside class activities that integrate ecological concepts into educational structures (Kellert, 2005). Children need to acquire environmental knowledge, skills and attitudes in

their early years or be at risk of never developing them and therefore EE should aim at developing positive attitudes and raising awareness about the environment (Wilson, 1994). Environmental clubs in primary schools provide an opportunity for environmental education in an interactive context. The extent to which environmental clubs programmes influence the environmental awareness of children remains largely unknown and due to this concern, the study sought to establish whether pupils who had completed their primary school syllabus and were members of environmental club as programmed in their school timetable possessed different level of environmental knowledge competences, environmental attitude and taking action for environmental protection than those who were not registered as environmental club members.

1.3 Research Questions

Based on the issues abstracted from the background to the study, the study addressed the following questions:

i. To what extent does belonging to an environmental club influence on environmental knowledge of pupils in the study area?
ii. To what extent does belonging to an environmental club influence on environmental attitude of pupils in the study area?
iii. To what extent does belonging to an environmental club influence on taking action for environmental protection to pupils in the study area?
iv. Do boys and girls in the study area show varying levels of environmental knowledge, environmental attitude and taking action for environmental protection?

1.4 Research Hypotheses

The following hypotheses were used to answer the research questions:

i. Environmental clubs members show more environmental knowledge competence than non-club members in the study area.
ii. Environmental clubs members show more positive environmental attitudes tendencies than non-club members in the study area.

iii. Environmental clubs members engage more in environment protection activities than non-club members in the study area.

iv. Girls in the study area have more environmental knowledge competences, more positive environmental attitude aspects and participate more in actions for environmental protection than boys.

1.5 Objectives

The overall objective of this study was to assess the influence environmental clubs have on the environmental knowledge, attitude and taking action for environmental protection in primary school pupils who had covered their primary school syllabus. This was done by comparing club members and non-club members. The specific objectives were:

i. To find the extent belonging to an environmental club influences environmental knowledge of pupils in the study area.

ii. To determine the extent belonging to an environmental club influences environmental attitude of pupils in the study area.

iii. To find the extent belonging to an environmental club influences taking action for environmental protection in pupils in the study area.

iv. To determine whether boys' and girls' environmental knowledge, environmental attitude and taking actions for environmental protection in the study area was different.

By assessing the relationship between environmental club affiliation and its influence on environmental knowledge, environmental attitudes and taking action for environmental protection the study will shed more light on how to achieve the efficacy of environmental education in practice. The outcomes of this study impacts the practice of environmental clubs in schools and hence develop a positive effect on environmental awareness competencies. The findings of this study will have important epistemological and pedagogical implication regarding environmental clubs and other co-curricular programmes in the primary schools and beyond. The study contributes to an understanding of social activities systems that provide learning opportunities to pupils in primary schools (Dhawan, 2012).

1.6 Theoretical Framework

Socialization based theory explains the gender differences in environmental variables. Socialization theory directs girls towards a care giving role which enable them to be more protective, nurturing and cooperative than boys. This type of 'motherhood mentality' promotes development of protective attitude towards the environment. Conversely, boys are directed towards an economic provider role which encourages them to be more rational, masterful and competitive compared to girls. This 'market place mentality' in boys promotes the development of a lower level attitude that is related to economic growth, technical mastery of the earth and exploitation of resources (Blocker and Eckberg, 1997).

Structural theory focuses on nature of the occupation and economic positions that result in gender differences in environmental attitudes of girls and boys. While boys are assigned to the breadwinner role and control the techno scientific realm, girls keep their nurturance roles with the responsibility of homework and childcare. For that reason, boys hold favourable orientations towards economic growth which result to lower levels of environmental concern. However, girl's nurturance roles make them more likely than boys to favour health and safety issues and in turn enhance their environmental concerns (Cavas et al, 2007).

From the theoretical framework of socially critical approach, environmental knowledge, attitudes and taking action for environmental protection are constructed through social interactions. When EE is presented as an active learning process there is likelihood that environmental knowledge, environmental attitudes and taking action for environmental protection tendencies increases and the overall effects are better conservation of environment at the local level. The explicit assumptions of the study were that changes in pupil environmental knowledge, environmental attitude and taking action for environmental protection could be determined by comparing the club members and non club members as independent variables which can be altered in the given model and that any differences resulting thereof were due to the intervention of the environmental club programme.

1.7 Conceptual Framework

Environmental clubs uses interdisciplinary approach to provide an open ended learning and problem solving skills to pupils through; putting local environment, action and learning at the centre of education in order to enhance sustainable lifestyles, taking action for the environment as an essential part of learning, while at the same time solving environmental problems, utilizing micro-projects as learning aids and as linkages for community partnership and networks. They also enhance democracy through participation (Mwangangi, 2012).

In the conceptual framework depicted in Figure 1.1, the environmental clubs (independent variable) were supposed to influence environmental knowledge, environmental attitude and taking action for environmental protection (dependent variables) of learners in the study area. The framework postulates that participating in environmental clubs directly affects environmental awareness of club members or non-club members. However, the relationship can be modified by content offered in the school curriculum and environmental information obtained from mass media. Environmental clubs were identified as the treatment administered to pupils in order to enhance environmental education in the study area. The pupils who participated in environmental clubs were presumed to have acquired more EE relevance than those who did not participate in EE programmes.

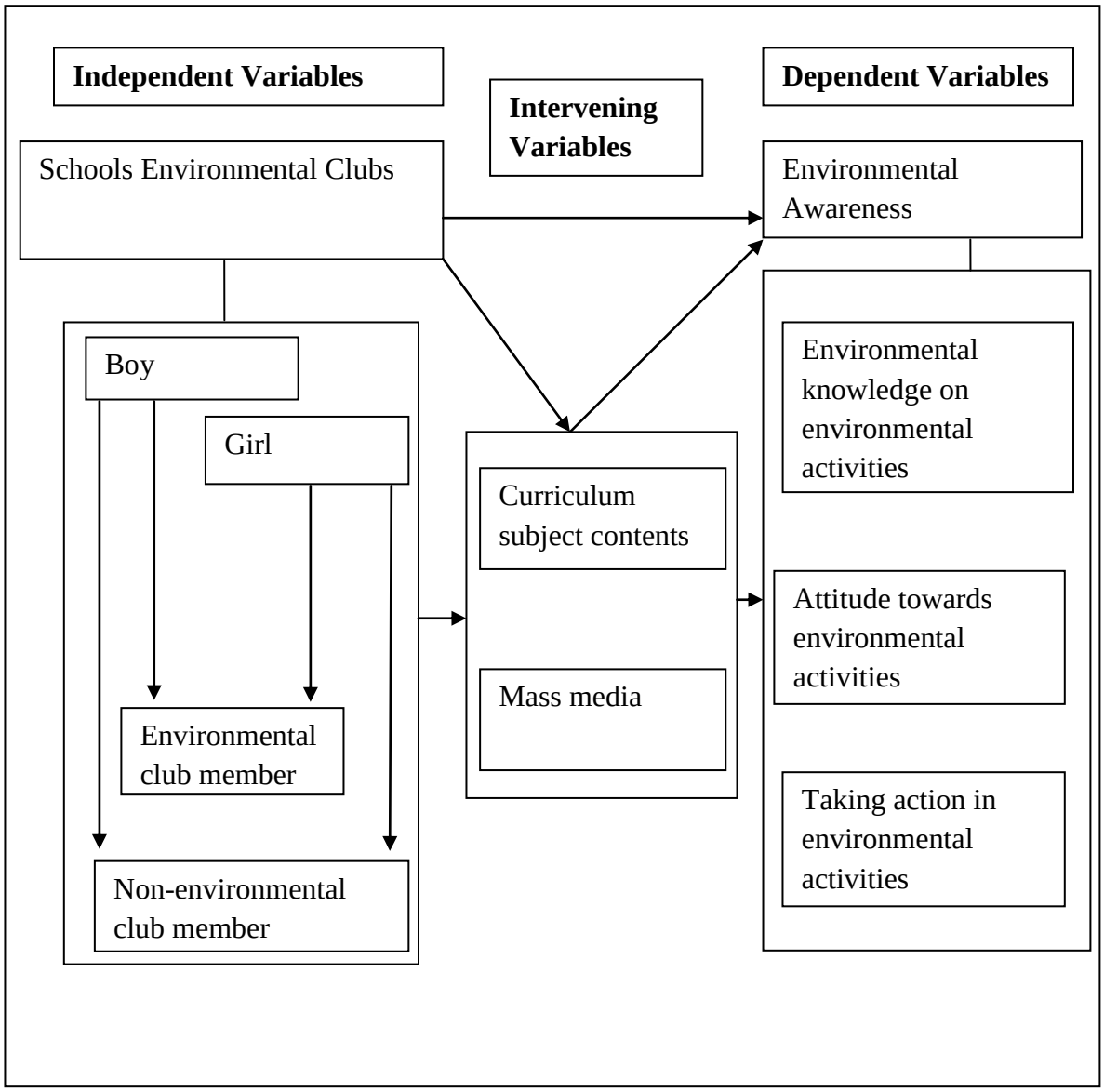

Figure 1.1: A conceptual framework (Source: Oso and Onen, 2009)

1.8 Scope of the Study

The success or failure of environmental education implementation in all levels of education depends on foundation provided to the learners at the primary level. The availability of knowledgeable and well adjusted individuals who have positive attitudes towards environmental protection is crucial to the success of sustainable environmental education. The study included only class 8 pupils in public schools in the study area. Class 8 pupils were chosen because they had stayed as environmental club members for the longest duration in their respective schools. They had also covered the environmental

education syllabus infused in other subjects and therefore any difference in parameters of environmental awareness between club members and non-club members was attributed to environmental club participation.

However, the results of this study were considered credible only if (i) the respondents gave accurate and honest responses in the questionnaires (ii) both club members and non club members had prior exposure to environmental information through environmental education contents infused in primary school syllabus. (iii) Schools with environmental club day programmed in their timetable did actually participate in environmental conservation activities.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter contains literature review on environmental clubs and environmental awareness. Under environmental clubs involvement the sub-sections include; historical development of environmentalism, environmental clubs as learner-centred approach, environmental clubs as non-formal environmental education programmes, environmental clubs as experiential learning models, development of learning theories in relation to environmental clubs and environmental education relationship to environmental clubs. Under environmental awareness the study has included; environmental knowledge, environmental attitude, taking action for environment protection, environmental awareness and gender issues. The chapter concludes with the knowledge gap that the study aimed to fill in environmental education.

2.2 Environmental Education Approaches Relationship to Environmental Clubs

Environmentalism began as a result of increased human population that led to massive landscape change due to urbanization and industrialization. Natural resources were devoured by destructive practices like mining, overgrazing, timber cutting, mono-cropping and speculation in land and water rights. To protect natural resources, environmental organisations were formed to support conservation and preservation. Conservation groups emphasized for efficient use and development of physical resources to combat inefficient land management (Stacy, 2001). Sierra Club in the United States is perhaps the oldest environmental club formed to promote the protection of the natural environment and conserve wildlife (Scheese, 2002). Conservation education movements were started in response to the soil erosion, dust storms and flooding disasters in the 1930s in the United States. The main goal of conservation education was to stress the importance of conserving various natural resources. At this time schools were given land designated for nature study by legislation, churches and agencies sponsored camps aimed to promote the understanding of the natural world (Athman and Monroe, 2001). Progressive education movements led by John Dewey emerged around this time. They

stressed the importance of learning by doing while in the environment. Later, outdoor learning came to prominence with its specification being the place for learning outside the school building. It was in response to concern that urban youths were not experiencing direct contact with the natural environment (Athman and Monroe, 2001). The origins of environmental education can be traced to the promotion of nature and outdoor study, essentially in primary schools, and later to the conservation movement (Stevenson, 2007). Stevenson contends that the primary purpose of nature study was to develop an understanding and appreciation of the natural environment through first-hand observations. The conservation movement introduced a concern for the preservation of species and areas of natural significance through sound management. Conservation education was greatly driven by the conservation movement whose objective and focus was to create awareness and modify learners' behaviours towards preservation and conservation of the physical ecological environment (Stevenson, 2007). Within the broad project of these movements, neither nature study nor conservation education challenged the socio-economic or political fabric of the society. School practices generally indicated that nature study and conservation education aimed at developing knowledge, skills and awareness about natural resources and their management. They were incorporated into primary school curricula and the science and geography curricula of secondary schools (UNESCO, 1977).

Conservation education focused on the importance of public better understanding of natural resources, developing citizen support for sound natural resource preservation, conservation and management programmes. On a socio-political level, Rachel Carson's Silent Spring in the 1960s brought warnings of imminent ecological disasters. There was an extensive emergence of organisations such as Friends of the Earth, which together with pressure from the media made scientists and ecologists reflect a widespread concern in the late 1960s and early 1970s that action was needed to change the prevailing pattern of damage to the environment. These concerns led to environmental discourses that were more concerned about the global socio-ecological issues such as inadequate supply and availability of fresh water, rapid population growth, poverty and inequality, food shortage, depletion of tropical forests, loss of biodiversity, pollution and desertification

that could not be solved by preservation and management approaches alone (Stevenson, 2007).

In 1972, the United Nations Conference on the Human Environment (UNCHE) in Stockholm, Sweden, called for the provision of environmental education as a means to address the global socio-ecological crises worldwide. The Tbilisi Conference that was held in 1977 intensified the call for the recognition of environmental education. Later, with increased environment development discourse, the concept of sustainable development emerged through the Brundtland report, Our Common Future, (WCED, 1987). This concept was meant to take a holistic approach in tackling environmental issues in a more sustainable and pluralistic way that moved away from the technical approach that was mainly concerned with developing quick technological fixes to environmental problems to a more holistic approach that focused on societal empowerment through participation across all sectors of society (Breiting and Wickenberg, 2010). From this some influential and widely accepted policy statements emerged in United Nations international conferences with an established clear consensus that this approach could be realised through participation by all stakeholders in environmental education processes. Emerging from the Stockholm conference, participation of learners as a key concept in learning in environmental education was included in a number of key United Nations policy documents (Belgrade Charter, 1976; Rio Declaration, 1992; UNESCO-UNEP, 1976). The Belgrade Charter argued that learners should be provided with opportunities for active participation in all levels of activities to solve environmental problems (UNESCO-UNEP, 1976). In its principles, the Rio Declaration of 1992 also made reference to the importance of participation handling environmental issues by all concerned citizens (including children) at the relevant levels through facilitating and encouraging public awareness and participation by making information widely available to the concerned parties (UNESCO-UNEP, 1992). These principles can be achieved by forging a partnership that mobilizes the creativity, ideals and courage of the youth in order to achieve sustainable development and ensure a better future for all (UNEP, 1992).

The first serious concern for the environment in Kenya was initiated in 1971 with the setting up of an ad hoc committee to prepare the Kenya National Report on Environment (KNRE) that was presented in the United Nations Conference on Human Environment (UNCHE) in Stockholm Sweden in 1972 (Gok, 1972). Some of the environmental problems identified in the report included urbanization, settlement in marginal areas, soil degradation, pollution and drought. On environmental education, the report identified that the School Science Project (SSP) for secondary schools included aspects of population growth and control, resource management and pollution in the curriculum while a proposed humanities project also for secondary schools, dealt with man's integration with his environment and impact of technology on the environment (GoK, 1972).

By the time Kenya participated in the Stockholm Conference, environmental education programmes were at infancy stage and mainly confined to secondary schools. Integration of environmental issues was disciplinary with scientific fields being more favoured as carriers of environmental education than humanities fields. The committee formed in 1971 led to the establishment of the National Environmental Secretariat in 1974 to coordinate all environmental activities undertaken by various government ministries and departments. The kenyan government has since the publication of the report of the National Committee On Education Objectives and Policies (NCEOP) in 1977 made deliberate attempts to mainstream environmental issues in all curricula at all levels. The commitment was reiterated when parliament adopted sessional paper No. 6 of 1988 on education and manpower training for the next decade and beyond with a call to make environmental studies part and parcel of every training and to be intergrated at all levels of education. At the primary and secondary education level, environmental issues are mainstreamed in the existing subjects using a multidisciplinary approach. In 1977, the Ministry of Education issued a policy stating its "responsibility to educate the young people of Kenya towards preserving and enhancing our environmental heritage" (Kamunge, 1980). This policy directed the quality assessors and other senior education officials to consult and develop guidelines for the integration of environmental education in the existing curriculum. This policy statement enabled the entry of environmental concerns into the secondary school curriculum although it used a top-down approach. At primary school, environmental issues were integrated in subjects such as Science,

Agriculture, Home Science, Geography, History and Civics in 1985 (Lindhe *et al.* 1993). In 1986, environmental education issues were integrated in the curriculum of pre-service training of primary school teachers in subjects such as Science, Agriculture, History and Civics as well as Industrial Education (Lindhe *et al.* 1993). The need to make environmental education processes an integral part of both the formal and non-formal curricula was made precise in Sessional Paper No. 6 of 1988 (Gok, 1988). However, there was little effort done at classroom level beyond a discipline-based approach to the teaching of environmental education concepts.

The education system thereafter turned out to be more exam-oriented and content based with an increased workload for both learners and teachers thereby leaving little room for socially critical approaches to environmental education processes (Karembu, 2002). The school curriculum thus appeared not to have been sufficiently and effectively implemented to take account of the complex, interdisciplinary character of environmental education processes (Fien and Tilbury, 2002). Consequently, the education process became part of the dilemma confronting the teaching of environmental education processes in Kenya as elsewhere (Hopkins and Mckeown, 2002).

2.2.1 Environmental Clubs

Environmental clubs are coordinated and voluntary effort groups of pupils working for the understanding and protection of the environment. Environmental clubs comprises of pupils network who are interested in participating in programmes beneficial to the environment (Dhawan, 2012). A well-planned and organized Environmental Committee amongst pupils provides scope for understanding and appreciating the intricacies in nature and interdependence of all living organism in the environment. Environmental clubs generate environmental awareness among the pupils. They are also a good resource centre for the neighbouring schools. The aim of environmental clubs is to educate children about their immediate environment and impart knowledge about the eco-systems, their inter-dependence and their need for survival, through visits and demonstrations and to mobilize youngsters by instilling in them the spirit of scientific inquiry into environmental problems and involving them in the efforts of environmental

preservation. The objectives of environmental club are: (1) to make children understand environment and environmental problems. (2) To provide environmental education opportunities through activities for school children. (3) To utilize the unique position of school children as conduits for awareness of the society at large. (4) To facilitate children's participation in decision making in areas related to environment and development. (5) To bring children in to direct contact with the environmental problems facing the society they live in and make them think of solution. (6) To involve children in action based programmes in their surroundings related to environment.

Environmental clubs in primary schools are categorized as young people led development projects (Seymoar, 2008). According to United Nations Human Settlements Programme (UN-HABITAT), young people led development projects, have the following principles: (1) Young people should define their own development goals and objectives (2) Young people should be given a social and physical space to participate so as to enhance their development. (3) Adult mentorship and peer-to-peer mentorship should be encouraged. (4) Young people should be role models in order to help other youths to engage in development. (5) Young people should be integrated into all local and national development programmes and frameworks.

UN-HABITAT focuses on young people taking a leading role in their own development corresponding with theory of Communication for Social Change while emphasizing on participation, which altogether leads to social inclusion (Mgimwa and Thulstrup, 2011). Reflecting on the environment clubs in primary schools, they do pursue to put in place structures where young people can take lead and create their own social change. They may require adult as well as peer to peer mentorship.

Environmental clubs in primary schools get members from pupils with similar interests (Wanjiru, 2011). Club members agree on the meeting days and they agree on how to execute proposed activities. Wanjiru (2011) identified various co-curricular movements in schools that champion for environmental responsibility among the pupils. They include; (1) National movements coordinated by non-formal institutions outside the school set-up. These facilitate learning by providing the club members with literature in

form of films, books and technical advice. Some of these clubs include wildlife clubs, girl guilds, scouting movements, red-cross and *Kuungana, Kufanya, Kusaidia, Kenya (*4K*)* clubs. (2) Religious clubs in primary school instill morality in primary school pupils who subscribe to them. They include clubs like Catholic Action and Christian union. (3) Disciplinary subject based clubs like mathematics club; science club, art club and poetry club are also found in primary schools.

Environmental club uses theoretical and practical mode of information dispatch. They include lectures, drama, posters, audio-visual, films, simulations and tree planting (Wanjiru, 2011). Wildlife clubs are the oldest environmental clubs in Kenyan schools. They were started by pupils in quest to learn and appreciate Kenya's rich biodiversity. Since then Wildlife Clubs of Kenya have expanded to primary school level where almost each school in the country has an environmental club (McDuff, 2000).

Scouting is a non-formal educational movement for boys and girls whose eco-strategies were formulated by Baden Powell in the 20th century (Lonegren, 2011). Scouting main objective was to bring up responsible active citizens who can positively contribute towards the society. Young people awareness on the environment is an indication of an informed future. The scouting movement aims at educating the young people on how to become responsible and engaged citizens (World Scout Bureau, 2002). Conservation and causes of environmental degradation are highly stressed in qualification as a scout in the primary school. The European Youth Forum (2008) stresses scouting movement as a non-formal movement that aims at changing the society. Individuals participate on a voluntary basis and as a result, they take an active role in the learning process. Lonegren (2011) identifies scouting to have a practical approach to educating the young people as opposed to abstract and theoretical learning offered by formal learning. He notes that scouting offers learners a chance to live in nature without using day to day equipment's which are an indication of passive adaptation. People need to acknowledge their indirect environmental impacts as well as their direct impacts when on camps, a development that could be linked to the direction of domination of nature. Scouts are encouraged to do concrete, hand-on activities and therefore gain first hand environmental experience (Lonegren, 2011). Besides the hand-on activities, scouting builds youth character and

morals through outdoor activities, physical fitness and volunteerism. For instance, Kenya Scout Association (KSA) is deeply involved with community development and has special programmes for the prevention of HIV/AIDS for pupils.

4K clubs are expected to be co-ordinated by the local agricultural office. The clubs involve pupils with agricultural projects of growing crops and sometimes the clubs are involved in environmental projects like planting trees and environmental cleanups. 4K clubs started in primary school system in early 1960s with an aim of uniting Kenyans to work together to build the country's agricultural sector. They were provided for in the education curriculum. (Ndaruga, 2004). 4K club members are supposed to have projects in school and at home. Environmental clubs promote appreciation for the environment, empower and inculcate in learners critical thinking in order to take environmental action at an early stage. 4K club movement utilizes an asset based approach which views young people as neither ignorant nor passive beneficiaries, but as active contributors to solving the problems faced by the environment (Ryan, 2008). The notion of an asset based approach to young people is inspired from the UN-HABITAT which among other initiatives works across the world in efforts to engage and empower young people.

Since clubs are established and facilitated by voluntary pupil's membership, they provide an avenue to acquire skills needed to identify, investigate, and experience the resolution of environmental issues. They are coordinated by elected pupils representatives and patrons who are mainly teachers. According to Kuh *et al*. (2007), pupil's engagement while in school comprises two components. First, amount of time and efforts learners put into their studies and other educationally purposeful activities, and secondly, how the schools deploy their resources and organise their curriculum in order to support services that induce learners to participate in activities that lead to experiences and desired outcomes. Therefore, learners' participation in co-curricular activities is not restricted to individual efforts only but also to how an institution organises and implements educational environments. Studies have shown that school life impacts greater for pupils who are more engaged in various aspects of school life and this leads to desired outcomes of learning. Astin (1993) and Tinto (1997), found an association

between pupils involvement in co-curricular activities and positive influence it had on learning.

Environmental education (EE) programmes are not restricted to school children only. They occur anywhere as long as people are interested in learning. Non-formal EE according to Norland (2005) is education in which participation is voluntary. It is an organised educational process which takes place alongside mainstream systems of education and training, and does not necessarily lead to certification (Hassan *et al*., 2009; Semegne, 2007). All programmes outside the class-work that learners engage in and are concerned with environment for the purposes of this study were classified as environmental clubs.

The exposure to education programmes outside classroom deepens and enhances educational experiences that pupils have in the classroom. These experiences influence affective, cognitive and social realms of learning and accommodate variety of learning styles and intelligences. Experiential and social learning skills are important aspects derived by those pupils who participate in environmental clubs (Bourke, 2011). Farmer *et al*., (2007) indicates that when environmental education is carried out in nature with field works, it becomes easier for the acquired knowledge to turn into actions and positive attitudes towards the environment. Palmberg and Kuru (2000) identified environmental club activities like recycling and how they can help children to develop effective relationship with the environment and sensitivity towards nature. Bogner (2002) outlined the importance of environmental club activities in creating positive changes in the environmental behavior. Ozdemir and Uzun (2006), found that Science and nature activities performed in a green class setting, based on direct interaction with living things, considerably improved children's environmental awareness. Uzun, *et al*. (2008), reported significant increases in environmental awareness of pupils due to green class model applications.

The choices made by a young person can have far reaching implications in his/her future development path. Nicoli (2011), found that participating in structured outdoor activities prepare pupils with skills which can help solve problems, take initiatives and make

decisions in different contexts and varying conditions. Jamalis and Fauzee (2007) found that pupils who participate in club-based activities are better organized than pupils who are not involved in any club activities. However, Feinstein *et al*. (2006), found no evidence that clubs are beneficial in the development of the youth while in school. Participating in academic clubs is related to positive academic adjustments, according to Eccles *et al*. (2003) and Barber *et al*. (2001), which is a result of associating with peers who value academics. Larson *et al*. (2010) found non-formal education programmes to promote eco-affinity and environmental knowledge of respondent in a research involving Americans primary school pupils.

Several benefits accrue to learners who participate in co-curricular activities like environmental clubs. Kuh *et al*. (2007) examined how institutions promote learners participation in out of class activities and highlighted that; (i) co-curricular activities foster a sense of community (ii) pupils get a chance to gain useful skills that are not provided in class by participating in co-curricular activities and (iii) peers influences how a pupils spends discretionary time, in turn affecting time spent on educationally meaningful activities since learners spend bountiful time out of class. Participation in co-curricular activities offers learners opportunity for constant interaction with members of the school and thereby increasing a likelihood of integration (Tinto, 1988).

While co-curricular activities are available to all learners in primary schools, a large number of pupils do not participate in them due to several challenges as enumerated by Mwangangi (2012). This formed the basis for this study in an effort to determine whether participating in environmental club activities effect environmental awareness.

2.2.2 Learner-Centred Approach in Environmental Education

Teacher-centred approach of learning is generally seen as an information transfer from the teacher to the learner. In this form of learning, the desks are arranged in a row and most of the time the pupils face in front of the blackboard where the teacher is talking and questioning the learners all at the same time. The learners work on assigned tasks by the teacher (Daniels *et al*, 2001). Pupils' participation is passive.

In learner-centred approach the focus of the teacher and instructions move to the pupils. The pupils talk more, chooses the subject matter and cooperation among the learners is paramount. In an effort to maintain the vision of learner-oriented learning, pupils in environmental clubs work in small groups. After an agreed task is completed, the club members shift to another assignment that they agree among themselves. Hand-on activities are accomplished at the learners pace of learning. Learning at environmental club level is open learning in terms of method of instruction. The setting of environmental clubs is highly pupils-centred approach (Bauer, 2003).

Pupils taught by learner-centred approach show significantly higher scores in cooperative learning and they are psychologically and physically healthier than pupils taught in competitive classrooms of teacher-centred approach (Lord, 2001). Pupils in learners centred approach lessons have higher achievement scores than those taught through teacher-centred approach (Randler and Bogner, 2006). Social skills and social competences are easier to train in learner-centred lessons than in teacher-oriented class (Lord, 2001). Chang and Fisher (2006) found the perception of an affirmative, favourable and fulfilling learning environments tends to lead to increased achievement scores. However, not all studies on learner-centred approach link it with high cognitive learning outcomes. Randler and Bogner (2006) argue that an unfamiliar environment for the pupil causes anxiety and therefore inhibit learning success.

In this study, environmental club members were perceived to obtain both teacher-centred approach and learner-centred approach. On the other hand non-club members received only the teacher-centred lessons. The study intends to maintain the ongoing discourse on the importance of integrating learner-centred approach and teacher-centred approach in the teaching learning process.

2.2.3 Experiential Learning Approach

Experiential education programmes can have a positive impact on pupils' psychological, social and intellectual development, and have been shown to increase pupils' character qualities such as self-esteem, reasoning and responsibility. Many pupils learn better by doing. Activities that are created to have pupils learn by doing have been shown to work

better than when they are passive recipients of programmes or information. If then learning by doing and participating in interesting environmental education programmes creates transfer it makes sense to attempt an environmental club in an after-school setting (Conrad and Hedin, 1981).

Nature study allows pupils to learn by doing, experimenting and cultivating their whole person through appreciation for morals and beauty. The concept of outdoor learning enhances learning and motivation according to Comenius (1592-1670). He advocated that every school need to have a school garden (Braund and Reiss, 2004). Rousseau wrote about the powers of outdoors in his novel, *Emile.* Pestalozzi advocated for pupils to have access to gardens with individualized plots. Pestalozzi argued that mind receives and processes information based upon impressions from the outside world and that exposure to noble sites and experiences raises the moral standing of a learner. She was credited with the "pedagogy of intuition" where learners were encouraged to explore the outdoors and natural world with very little assistance (Harder, 2010). Intuition gained from natural experiences is interpreted by senses. She envisioned a school where learners would use their senses, discard books and didactic lessons in order to exercise their consciousness and through this active exploration of the world find intellectual and moral development. Pestalozzi advocated that learners should begin their studies of the natural world in their immediate surrounding and only after discovering what was near to them would they be able to navigate and interpret their community and the greater world (Thorp, 2001).

Froebel (1782-1852) felt the need for children to be in nature for them to develop unity between themselves and the natural world, to reach their individuality and their full potential. It is by exploring things in their natural environment can a pupils truly understand the meaning of things in the surrounding and it is by studying what is near him/her can one proceed to study the larger community. It is in gardens that learners practice basic utilitarian skills such as cultivation of plants. For Froebel, nature inspired art with the garden as the outdoor classroom. Froebel and Pestalozzi practices of education aimed at educating the whole child through common objects in their everyday world. There before, conservative practices dominated by teachers as expert were based

on memorization and recitation. Their philosophies focused on children initiating the doing, investigations and problem solving (Harder, 2010).

Montessori school gardens are critical part of a child development. A contact with nature is essential for nurturing a child spiritual and religious self. She felt that nature and outdoors was good place for children to get basic exercises, develop independence and to learn. According to Dewey (1859-1952), outdoor learning develops moral character. He was of the view that good education should provide pupils with interactions with the natural world. He viewed the classroom set-up as a place for passivity and absorption that impede the natural flow of how pupils works and processes information. He believed that children learn by investigating, experimenting and observing and not just by acquiring facts. King felt that by participating in gardening children acquired responsibilities that helped them to develop judgment, contact with the environment and this relieved their classroom restrictions (Harder, 2010).

Silberman (2007), suggests that experiential learner-centred education should: (a) develop the skills of inquiry and exploration in both local and contrasting environments where learners explore all possible ways of living in harmony with the environments (b) develop communication skills, particularly through discussion and debate, leading towards the practice of decision making and arriving at value judgments where common grounds will be found on types of actions as well as projects to be carried out for a common purpose (c) build an understanding of place, time, change and relationships using concrete phenomena that pupils can perceive and relate to by dealing with matters that relate to their resource base and not in abstract terms (d) Provide an enjoyable experience by participating in decision making and implementation of plans (e) Create activities which influence a learner's values, ethics and attitudes (f) Provide learning experiences which are perceived as intrinsically valuable, worthwhile and significant.

Conservation efforts increase the intensity of outdoor education which seeks to provide survival skills and a feeling of personal accomplishment to the learners. School gardens and outdoor classrooms are a mechanism for teaching pupils life skills related to resource management and sustainability. In order to remain effective vehicles for environmental

education, all types of outdoor classrooms and gardening areas need to be continued in order to enable learners to think locally and then globally. A re-orientation of education practices can develop strategies to teach awareness skills, perspectives and values that guide and motivate people to pursue sustainable livelihoods, participate in democratic society and live in a sustainable manner in order to achieve the goals set forth in the international environmental education agreement such as Belgrade, Tbilisi and Agenda 21. The transition between localized nature study and creation of environmentally responsible behaviours should be a natural one. A diverse experience of outdoor classroom should provide easily accessible tools to understand the natural world and to act sustainably (Harder, 2010).

2.2.4 Environmental Clubs as an Approach to Environmental Education

Suggestions by environmental theorists hold that relating with nature directs individuals towards a greater ethical and moral understanding of the environment and connectedness to the natural world (Merrick and Prince, 2008). Environmental awareness of people in need for social change can be improved when they interact with the natural world through environmental movements (Charles *et al*., 2008). Exposing learners to the environment through environmental clubs is likely to improve their environmental values and understanding instead of filling their mind with factual information which may not be assimilated due to lack of good understanding.

It is only through informed understanding of the environment that the global population can be convinced of its responsibility. In order to create a sense of environmental concern through education, it calls for more than mere knowledge and understanding. It also demands positive attitudes towards the maintenance of the earth's geological integrity. All earth linked studies both theoretical and practical, can enable individuals to enjoy their environment fully as well as develop a responsible attitude towards it. Therefore, environmental education must: (1) teach learners about the natural world around them. Apparently, areas of study such as science and social studies have this aspect of environmental education. In this way through investigation, observation and discovery, pupils come to learn interesting, useful and vital facts about their surroundings (2)

Involve learners in real situations. Opportunities need to be created where pupils can ask questions about their environment, and find answers to them. Problems are set and solved by using the surroundings as a source of information and this where environmental clubs become part of the learning (3) Enhance acceptable and responsible attitudes towards the environment, given the interdependence between mankind and the various environments. An understanding of the ecological system must be developed together with a genuine concern for the environment (Merrick and Prince, 2008). EE enables pupils to develop positive attitudes. It also must be seen as not merely a strategy for creating awareness of the environment, but also as a means towards developing positive concern for maintaining the quality of our life on earth (Otiende *et al*, 1991).

Environmental education has three approaches namely; Education *about* the environment, education *in* the environment and education *for* the environment. Education *about* the environment is concerned with developing awareness, knowledge and understanding about human-environment interactions. Through this approach, pupils develop ecological understanding and sometimes environmental concern. This perspective includes subject curricula like sciences and arts where environment is a topic of study. It assumes that people degrade the environment due to lack of knowledge, appropriate attitudes and behaviours (Ndaruga, 2004). Education *in* the environment is pupil-centred and activity-based learning. It is a form of outdoor education. The concept revolves around fieldwork and experiential orientation, development of environmental awareness and concern to encourage personal growth through contact with nature (Tilbury, 1995). Environmental clubs are formed with this approach in mind where club activities revolve around ecological knowledge (Botma, 2000). Education *for* the environment esteems development of responsibility and active-pupil participation in the resolution of environmental problems. This approach adopts a holistic outlook to the study of environmental problems as reflected in the global and interdisciplinary approach. It also acknowledges political element that strengthens the study of the environmental situation and thus incorporating critical education goals within issue based pedagogy (Tilbury, 1995).

Environmental club activities focus on nature experiences and strategies to allow learners connect with nature. Experiential learning underpins environmental clubs movement. Environmental clubs seek to find solutions to local environmental problems and offer practical solutions which are action based leading to development of environmental knowledge and understanding.

2.2.5 Environmental Clubs and Development of Learning Theories

The status of the environment where one lives directly influences stages of development. At each stage, a child needs to assimilate and interpret new information based on previous knowledge and then make adjustments to utilize the newly acquired information (Hoyt, 1991). Constructivism is a continuous process of acquiring knowledge and then using that knowledge to construct new knowledge (Athman and Monroe, 2001). It encourages learners to look at the big picture and synthesize facts and different disciplines rather than participate in rote memorization. Environmental clubs fits in constructivism model as they involve something pupils do in the field and not something that is done to them. Learners generate knowledge and construct meaning through their own questions, planned investigations and problem solving skills (Athman and Monroe, 2001).

In constructivism, learning takes place through integration of cognitive process across time. Bloom taxonomy quantifies and ranks types of thinking and educational activities. The three domains include cognitive or mental skills, affective or attitudinal aspects and psychomotor or physical skills (Clark, 1993). The simplest aspect of cognitive domain is reciting facts while the deepest level occurs when one pull together several pieces of knowledge to synthesize and evaluate. In affective domain the learner demonstrate willingness to listen and pay attention. He/she then responds by taking action, attributing value to a related object, phenomenon or a person in light of new knowledge and evidence and incorporating the experience into his/her own value system (Harder, 2010). Environment based programmes enable pupils to function and synthesize information higher up within the domains thus performing better and retaining information longer than it occurs in learning situations where lessons remain lower on the domains. These

co-authors believe that a hierarchy of behaviours can be used to convey depth of behaviours. When a learner works through an exhibit, the experience should progress from initiation to transition to breakthrough behaviours. Acting out behaviour is an initiation stage. At initiation, the pupils gather information while still assessing and establishing a feeling of safety. Once an individual moves to the transition stage, he/she is likely to repeat the activity. After this a breakthrough is arrived at and the learner refers to the past experiences, identifying relevance, seeking and sharing information thereby restarting the scientific process and engaging in meaningful learning experiences. When routinely working in the higher domains, learners perform better and retain knowledge longer than in learning situations where lessons remain on the lower domains (Braund and Reiss, 2004).

2.3 Environmental Awareness

Environmental awareness is a goal that environmental education aims to achieve. It has got three components namely: environmental knowledge, environmental attitude and taking action for environment protection. The study emphasized the three components.

2.3.1 Environmental Knowledge

Environmental knowledge involves an attainment of a better understanding of the elements within the ecosystem and an appreciation of the dynamic working of the system. Environmental club experiences should increase pupils' knowledge of their local environment. They should increase pupils' skills such as observation, species identification, data recording, and spatial conceptualisation. Frick and Kaiser (2004), argue that knowledge is essential for successful action in environmental education. It encourages people to avoid harmful behaviours such as pollution, littering, forest fires, deforestation and other activities that endanger living creatures. Educational programmes can meet the goals of environmental education by increasing knowledge. A one-hour experiential programme was shown to be sufficient to significantly increase pupils' knowledge (Kinder, 2012). Education programmes that take place in a natural setting, as opposed to a classroom setting, lead to more knowledge gain, positive attitude development and environmental sensitivity (Cachelin *et al*, 2009). Educational

programmes that use hands-on learning techniques have the opportunity to investigate natural habitats and interact directly with the environment and are more effective at increasing awareness and knowledge (Ballantyne *et al*, 2000).

Several empirical studies on specific environmental knowledge (recycling, waste management, water management and deforestation) indicate that learners have low environmental knowledge. Sethusa (2006) while comparing between rural and urban learners' factual and conceptual knowledge found majority of the learners' knowledge to be low. He also noted that a large number of pupils in South Africa are environmentally illiterate while Araboglou (1993), noted that children in primary schools have low understanding of how water management operates. Ambrose (2004) concludes that in general children have limited knowledge of concepts related to the environment. Loughland *et al*. (2002) explored young people conceptions of the environment. They found that learners construct their own ideas about the world and conceive how the environment affects them.

Knowledge in environmental education is essential as it raises general awareness and provides individuals with the confidence to voice opinions on environmental issues. Fisman (2005) on ecological knowledge of children local environment suggest that pupils are not developmentally prepared to deal with major environmental issues. He contends that teaching children about positive aspects of their local environment builds their sense of caring and connection to the place they live. The goal of environmental education is to produce citizens who are knowledgeable about the bio-physical environment and its problem and actively engage towards the solutions. The findings of Padeliadu and Paraskevopoules (1998) with Greek children knowledge about the environment is influenced by their immediate experience as well as by the content of their text books, but overall, children's knowledge about plants and animals was limited. About American children environmental knowledge, Gambro and Switzky (1996) reported disappointing levels about environmental issues. Makki *et al*. (2003) discovered inadequate knowledge of basic environmental concepts and issues. They noted that learners were willing to take the necessary actions to protect the environment but lacked knowledge base to make informed decisions. The results of their study indicated favourable attitudes towards the

environment but insufficient environmental knowledge. They also found that environmental knowledge was significantly related to parental education level, participant's environmental attitudes, beliefs, affects and behavioural commitments. Children environmental knowledge is the product of interactions with a variety of setting and media. Olusanya (2005) explored how children learn outside the school environment. He examined the different informal learning context for children; home, museums, zoos, Nature Park and fields. All these settings were found to contribute to free-choice of environmental learning. The settings provided opportunity for intrinsic and self-motivated learning experiences. These settings also stimulate learning experiences with the goal of developing positive relationships and understanding of the environment. This type of learning encourages change of learning about the environment and improves levels of interests and increases knowledge through contextual cues from the outside knowledge (Olusanya, 2005).

2.3.2 Environmental Attitude

Environmental attitudes provide a good understanding of the set of beliefs, interests, or rules that influence pro-environmental action (Fernandez-Manzanal *et al.* 2007). They presume that if schools inculcate in children positive values and attitudes towards environmental conservation, then they would take an active role in conserving the environment and its resources and hence preserve them for the future generation. On the other hand, the attitude objectives are about acquiring set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection. Further, participating in environmental clubs provides an opportunity for active participation in working toward resolution of environmental problems.

Various theories that address environmental attitudes have been advanced and among them include affinity towards nature (Kals and Schumacher, 1999) and sympathy towards living beings (Allen and Ferrand, 1999). Altruism has been viewed as a reason for environmental concern, based on the assumption that good environmental quality benefits the larger population. Schwartz (1994) promotes interdisciplinary activity as a way to

foster environmental attitude and behaviour, claiming that those individuals who focus beyond their immediate social circles are likely to be stronger and more likely to be involved in pro-environmental activities. Environmental education is concerned with knowledge, values and attitudes and its aim is to instill responsible environmental behaviours. Attitudes, according to Tbilisi declaration of 1977, is a major objective of environmental education where EE is supposed to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection (UNESCO, 1977). In an environmental education programme, McNamara (1999) identified the outcomes as improved knowledge, enhanced perceptions, attitude and improved conditions such as increased ecological literacy. Attitudes come into light as opinions which form a value system. A value system is an enduring conviction that a specific mode of conduct is preferable to an opposing mode of conduct. Attitudes which are consistent with values are likely to protect the environment while 'cognitive dissonance' results when behaviours do not mirror the held values (Caduto, 1985). Since environmental club members are raised to believe that their actions can make a difference, they are likely to develop proactive nature. Ewert and Galloway (2004) identified environmental attitude as an area of interaction between humans and natural environments. They note that, in order to achieve behavioural change one need to have attitude change towards any given situation. Attitudes are considered as mediating variable between effective knowledge and behavioural intention (Frick, 2003). Thus, attitudes can be assumed to have a more immediate effect on environmental behaviour. Pooley and O'Connor (2000) suggest that environmental educators should aim to change attitudes.

Some studies do not detect any effect of EE programmes interventions on attitudes change (Eagles and Demare, 1999). A possible explanation for the lack of attitudinal change is given by Rennie (1994), who points out that attitudes are learned over time. Bogner (2002) and Bittner (2003), confirm from studies with school children, that short term EE programmes interventions have limited potential to induce permanent changes in attitudes. Marynowski and Jacobson (1999), detected short term changes in attitudes following EE programme interventions. To meet the challenge of changing the attitudes of children through EE programmes, it is important to include affective and emotional

aspects in order to target emotions and believes which are crucial measures to changes in attitudes (Pooley and O'Connor, 2000). Knapp and Barrie (2001), found no change in attitude after fourth, fifth, and sixth-grade pupils participated in an experiential, outdoor field trip, although knowledge had increased significantly. Eagles and Demare (1999) found that after a week-long programme, pupils' environmental attitudes were statistically unchanged. They suggested this was because of the moderately high level of environmental attitudes of the pupils prior to participation. Zelezny (1999) found that environmental attitude was significantly related to experiences in nature and active participation in environmental activities outside the classroom.

Younger age groups typically are more pro-environment (Jones and Dunlap, 1992), but this pattern may be changing. Whittaker *et al*. (2005) observed a decline in the willingness of young adults to self-identify as environmentalists, a trend that could have negative repercussions for conservation efforts. Researches on children's environmental attitudes have shown that a child's age may dictate levels of environmental concern. A temporal shift is best described by Kellert's typology of values (Kahn and Kellert, 2002). They note that children in early childhood seem to express a utilitarian and dominionistic view of nature. These values are consistent with the anthropocentric environmental attitudes in adults. Hence, Kellert (2005) suggested that educational programmes for early learners might best focus on affective components and emotional concern for animals and nature. In middle childhood, children develop an emotional attachment to the environment. The new appeal of nature for aesthetic, symbolic, or moralistic reasons may solidify a shift in late childhood to ecological appreciation, which can translate into eco-centric and preservationist environmental attitudes in adults (Kellert, 2005). These transitions are supported by studies that identify an increase in overall environmental concern once children reach age ten or eleven years (Eagles and Demare, 1999). Although general measures of environmental concern and factual knowledge increases as children approach adolescence, specific indicators of environmental attitudes and behavioural intentions are typically higher for younger individuals (Komane, 2005). The implications of these conflicting results are difficult to determine, especially in the context of EE programmes. A strategy that separates constructs like knowledge, attitudes and intentions to act can provide an opportunity for comparisons by affiliations to

environmental club and this would help identify whether emphasising EE efforts really affect learners.

Despite several studies investigating peoples' attitude towards the environment and suggesting that their attitude was positive, environmental destruction has continued unabated at the local, regional and global level (Bulent *et al*. 2009). A study by Mutisya and Barker (2011) in rural Narok town of Kenya's Rift valley Province found out that primary school pupils had high conceptual understanding and awareness of environmental degradation taking place in their local environment. However, they noted that there existed a gap between the conceptual knowledge EE and the motivation to participate in environmental conservation.

2.3.3 Taking Action for the Environment

Environmental activism is typically collective action that entails political or community-based actions intended to improve global, national, or local environmental quality. Instances of young peoples' effective environmental efforts suggest that at least some young people take environmental issues seriously and this concern leads to action. Individual actions also have great potential for preserving environmental resources, especially if enacted on a collective level (Winter and Koger, 2004).

According to Jensen and Snack (1997) the aim of an environmental action as a conventional pedagogical paradigm should focus on social and environmental change itself rather than to simply serve as an "action for the sake of action" mentality. An action as a pedagogical tool should dig down to the root of the problem, propose and try to manifest alternative solutions. Second, the decision to act should follow an informed and rigorously debated opinion and include appropriately elaborated emotional involvement of the participants, and should not be promoted by the undue influence of any external factor. For Jensen and Snack as far as voluntarism is concerned, children's statements reveal that learners engage in activities rather than actions which are dictated by the teachers and in the long run, they create disempowerment.

According to Yencken *et al*. (2000) a majority of learners when presented with a list of activities where they had taken some deliberate action to improve the environment, most respondents stated that they felt good about their actions. The most frequent actions were choosing household products that are better for the environment, recycling and reusing, reducing water consumption and taking part in clean-up campaigns.

Connell *et al*. (1998) found from a list of twenty actions, the most commonly reported actions were: reusing and recycling, choosing 'green' household products, reducing water consumption, and encouraging someone else to change an action or practice. The least reported actions were information gathering, exercises, and political activities like writing a letter, community oriented actions like tree-planting, and financial actions like making a donation. Confidence-building through work in the garden is seen in a number of ways. Some children learn to overcome their fear of touching worms or beetles, and enjoy getting dirty; others discover the virtue of patience as they wait for crops to be harvested; others simply enjoy being outside and watching things grow. Gardens are important to children as a way of building resilience to protect against life's potential misfortunes.

2.3.4 Environmental Awareness and Gender Issues

Education should play a leading role in creating awareness and a better understanding of the environmental problems. Man has a duty to the environment for its protection and sustainability (Yaghoobi, 2003). According to Sengupta *et al*. (2010), environmental awareness is knowledge about the environment, attitude, values and necessary skills to solve environment related problems. It is geared towards the ability to carry on responsible citizenry. Environmental awareness refers to respect accorded to habitat on whose well-being of existence depends on (Filho, 1994). Kollumuss and Agyeman (2002) described environmental awareness as knowing the impact human action has on the environment. They emphasized the cognitive awareness of environmental problems. Sudarmadi *et al*. (2001) and Vaselinovska and Osogovska (2012), identified environmental awareness to have three dimensions namely; attitude, knowledge and behaviour. According to Erdogan and Usak (2009), development of environmental knowledge, environmental attitude and taking action for environmental protection are the

end product of environmental education and encompasses environmental awareness. Environmental awareness is developed from various sources including media, family and school (Erdogan and Usak, 2009). Environmental aware persons are knowledgeable and informed about what is happening to the environment and they pay keen interest to it and also participate in solving environmental problems (Komane, 2005). Environmental club programmes are expected to instill in learners environmental problem solving skills and ability to refrain from creating new environmental problems.

Using socialization-based theories differences exist between boys and girls. An explanation for the different tendencies of boys and girls towards the environment was that girls have been traditionally responsible for looking after the home and children. Therefore, such actions could be perceived as a way of taking care of their offspring (Kuh *et al*., 2007). According to socialization theory, girls are directed towards a caregiver role which enables them to become more nurturing, protective and cooperative compared to boys. This type of 'motherhood mentality' promotes development of protective attitudes towards the environment. On the other side, boys are directed toward an economic provider role which encourages them to become more rational, masterful and competitive compared to girls. This 'marketplace mentality' promotes the development of a lower level attitude that is related to economic growth, technical mastery of the earth and exploitation of resources.

Structural theory focuses on the nature of occupation and economic position that result to gender differences in environmental attitudes of girls and boys (Blocker and Eckberg, 1997). While boys are assigned the breadwinner role and controlled the techno-scientific realm, girls keep their nurturance roles with the responsibility of housework and childcare. For that reason, boys hold favourable orientations toward economic growth which resulted in lower levels of environmental protection concern. However, girls' nurturance roles make them more likely than boys to favour health and safety issues and in turn enhancing their environmental protection concerns (Zelezny *et al* 2000).

Research continues to unveil different ways in which males and females experience learning environment. Familiar natural settings enhance learning experience in both sexes

according to Bixler *et al*. (1994). They note that fears, perceptions, engagement and modes of learning differ by gender and they affect motivation and optimal performance. Within classroom confinements, females have demonstrated higher flow than males (Shernoff and Csikszentmihalyi, 2009).

Women are more inclined towards supporting nature preservation and they are accorded credit when it comes to supporting environmental education programmes (Rodriguez *et al*., 2007; Vermal and Singhal, 2008). Ziadat (2010) found girls to have better environmental awareness than boys. Bas *et al*. (2011), found significant difference between boys and girls with respect to environmental attitude. They found girls to have a more favourable attitudes towards the environment than boys. According to Coyles (2005) however, females have an incomplete knowledge about environmental issues than males. Zelezny *et al*. (2000) found girls to be more concerned for the environment and exhibited more pro-environmental tendencies than boys. Females had stronger environmental attitudes than male and female were more likely than male to state that current laws and regulations do not go far enough towards the protection of the natural environment. Also females expressed greater concerns for the biosphere (Zelezny *et al*., 2000). Contrastingly, Tripathi (2000) found that boys had better environmental awareness than girls and also that girls are less interested in participating in outdoor activities. Hines *et al*. (1986) study shows lack of relationship between gender and environmental behaviours. According to Soni (2004), being a boy or a girl has insignificant influence on environmental awareness among Indian pupils.

2.4 Gaps in the literature reviewed

The study investigated the influence environmental clubs have on pupils' environmental awareness by comparing learners who are club members and those who are not club members. The study compared club members and non-club members' performance in environmental knowledge, attitude and taking action for the environment.

From the literature reviewed, different scholars have had different approaches to environmental knowledge, attitudes and taking action for the environment. Notably, most of the studies about environmental awareness were done in developed countries. In spite

of this, the literature is helpful in that it provides an understanding of how children interact with their environment. Almost all the scholars reviewed work attach environmental knowledge, attitudes and taking action for the environment to sources of environmental information which were outside the classroom setting. This validated the study on environmental clubs as a source of environmental knowledge, environmental attitudes and taking action for the environment. As indicated earlier little has been reported in marginal rural settings in Kenya.

The study also analysed the differences between boys and girls environmental knowledge attitudes and taking action for the environment in line with participation to environmental club which was an addition to the knowledge gap in environmental education studies.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter focused on methodology used on this study. The chapter discussed research design, study area, target population, sample size determination, sampling procedures, and data collection instruments, data collection procedures which entailed pre-testing of study instruments, validity and reliability. Data analysis, logical and ethical considerations were also discussed.

3.2 Research Design

A research design according to Orodho (2003) is a plan that is used to generate answers to research problems. The research designs employed in this study was descriptive. A descriptive design is defined as a process of collecting data in order to answer questions in the study (Kothari, 2010). Descriptive research involve gathering of data that describes events and then organises, tabulates depicts and describe the data collected. It then uses visual aids like graphs and charts to aid the reader in understanding the data distribution. The purpose of descriptive research is to become more familiar with phenomena and gain new insights (Hopkins and Mckeown, 2002).

In this study descriptive design used a survey as a method of collecting information by interviewing patrons of clubs and administering questionnaires to a sample of pupils. The design provided numeric descriptions of some part of the population. Qualitative and quantitative data collection methods were employed. The use of quantitative and qualitative research has several advantages in that both supplement each other and could check each other against biasness (Mugenda and Mugenda, 2003).

Qualitative data collection method aimed at identifying the activities learners engage in during environmental club activities. This information was derived from interaction with club patrons. The purpose of qualitative procedures in the study was to understand club

member experiences and derive meaning from the information provided by the respondents.

The quantitative analysis focused on the dependent variable of environmental knowledge, environmental attitudes and taking action for environmental protection in both groups. Quantitative procedures describe and compare attributes causality through numerical measures and give mathematical analysis and differences in those measures (Oso and Onen, 2009). The study collected information about the subjects without manipulating their studying environment.

On the basis of the information obtained, the respondents were classified as having low, moderate or high attributes of environmental knowledge, environmental attitude or taking action for environmental protection depending on their gender and on whether they participated in environmental clubs.

3.3 Study Area

The study was conducted in Karaba and Riakanau Locations of Mwea Division, Mbeere South Sub-County, Embu County in Kenya. The greater Mbeere has two Sub-Counties; Mbeere North and South that covers approximately 2,092.5 square Kilometres with an estimated population of 170,950 persons. Mbeere District lies in latitude 0° 20’ and 0° 50’ south and longitude 37° 16’ and 37° 56’ east (Wiesmann *et al*, 2014). Mbeere Sub-Counties are characterized by hot and dry weather condition for the greater part of the year, with bimodal pattern of rainfall; the long rains which comes between March and May and short rains between October-December, the latter being more reliable. Annual rainfall ranges between 640 to 1,100 millimetres with most parts of the area receiving 650 mm of rainfall per year (Kithama and Obondo, 2013).

It is divided into four administrative divisions namely Gachoka, Mwea, Evurore and Siakago with Mwea being the second largest occupying 24.2% of the total area. Mwea Division has two locations namely Karaba and Riakanau as shown in Figure 3.1. The average monthly income per household in Mbeere South District is shillings 2650/- (Kithe, 2014). This has great impact on quality and adequacy of school infrastructure and

learning resources. Majority of households in the study area are unable to meet their basic needs due to drought which is experienced after every three years (Kaloki, 2010). Rural communities in semi-arid areas are at risk of climate change which contributes to the burden of poverty and diseases because of their link to low rainfall and floods. Rural communities largely depend on agriculture and agriculture is the most climatic sensitive of all economic sectors. The communities in these regions are subsistence farmers. The areas that are located in warm regions and their main source of income is agriculture which is worst hit by changes in rainfall patterns, greater weather extremes and increasing droughts and floods (O'Donoghue,2001). The change in precipitation affects the quality and quantity of water supplies thereby compounding the impact to the poor (UNICEF, 2007). Because children are the most vulnerable, there is need to act decisively and engage them in learning processes that develop their actions and capabilities. This calls for participatory methods which are learner-centred. Active learning framework offers learners with opportunities to engage in activities in local contexts (O'Donoghue, 2001).

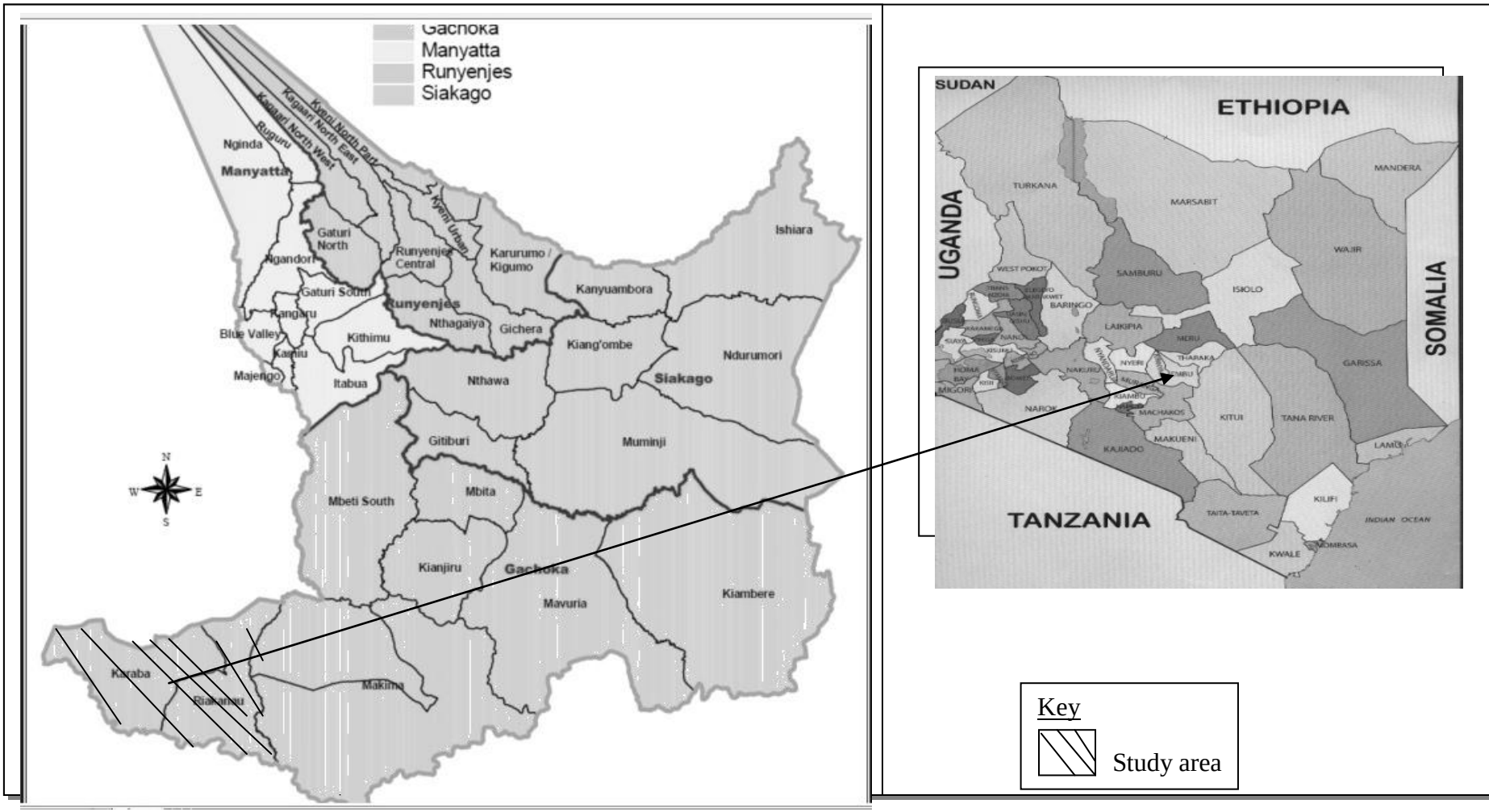

Figure 3.1: Karaba and Riakanau locations, Embu County (Google maps,2012)

3.4 Target Population

The target population for this study consisted of class 8 pupils in Mwea Division, Embu County. The success or failure of environmental education implementation in all levels of education depends on foundation provided to the learners at the primary level (Kithe, 2014). The availability of knowledgeable and well adjusted individuals who have positive attitudes towards environmental protection is crucial to the success of sustainable environmental education. The study provided an insight into the level of environmental awareness among boys and girls who are environmental club members and non club members in the study area.

It was not possible to include all class 8 pupils in the study area, the selection of schools was done using purposive sampling method in which the study targeted the schools with class 8 pupils who had covered the primary school 8-4-4 syllabus and therefore qualified as reliable for the study (Mugenda and Mugenda, 2003). There were 26 primary schools in the research area of which proportional random samples was used to select schools. A proportional sample is where the sample size is a fraction of the whole sample size (Fraenkel and Wallen, 2000). 10 schools which had environmental club members and 10 schools which did not have environmental clubs members were chosen. The choice ensured proportional representation of club members and non club members. 120 club members were chosen against 130 non-club members. It also ensured proportional representation of boys and girls with 124 boys and 126 girls being represented for the study (Table 3.1). They represented just above a third of the population. Therefore, the target group for the study was above the 10% minimum sample for descriptive statistics as proposed by Gay (1992), for statistical analysis.

The study identified all primary schools with environmental clubs and those without through the indulgence of the head teachers and club patrons of primary schools in the two locations. This way the researcher came up with two categories of the schools; those with environmental clubs and those without environmental clubs (Appendix VIII). In the primary schools where the club existed, the club patrons introduced the researcher to the respondents. In the primary schools where there were no environmental clubs the head

teacher assigned a lead teacher to organise for a meeting between the researcher and the respondents.

The class 8 pupils were chosen for this study because they had stayed as environmental club members for the longest duration in their respective schools. They had also covered the environmental education syllabus infused in other subjects and therefore any difference in parameters of environmental awareness between club members and non-club members was attributed to environmental club participation.

Table 3.1: Target Population of Pupils

Karaba Zone					**Riakanau Zone**				
S No.	Primary School	Boys	Girls	Totals	S. No	Primary School	Boys	Girls	Totals
1	Karaba Primary	13	21	34	1	Kathiani	13	12	25
2	Aic Wango	15	16	31	2	Riakanau	7	7	14
3	Gitaraka	13	17	30	3	Ngomola	2	6	8
4	Makutano	35	33	68	4	Consolata Kilia	10	10	20
5	Iriaitune	28	28	56	5	Gategi Pry	15	7	22
6	Kikumini	21	16	37	6	Kamwiendei	12	10	22
7	Kamweli	11	10	21	7	Ack Kilia	12	8	20
8	Maviani	9	17	26	8	Kaseve	7	12	19
9	Consolata Karaba	20	23	43	9	Koma	11	7	18
10	Wakalia	18	12	30	10	Nthingini	8	9	17
11	Karuku	12	15	27	11	Malikini	19	15	34
12	Kaseveni	6	14	20	12	Kakindu	8	10	18
13	Makawani	14	14	28	13	Musingini	16	10	26
	Sub Totals	215	236	451		Sub Totals	140	123	263
TOTALS							355	359	714

3.5 Sample Size Determination

After purposive sampling of pupils by club membership and gender, the study sample size was determined by use of a formula described by Mugenda and Mugenda (2003) .

n= $Z^2 \frac{pq}{d^2}$ where;

n = the desired sample size (if the population is greater than 10,000).

Z = the standard normal deviate at the required confidence level.

p = the proportion in the target population estimated to have characteristics being measured.

q = 1-p

d = the level of statistical significance set.

Since there was no estimate available, 50 percent characteristics in the target population were assumed to have the characteristics of interest. If the proportion of a target population with a certain characteristic is 0.50, the Z statistic is 1.96, and since the desired accuracy was at 0.05 levels, the sample size was given by:

$$N = \frac{(1.96)^2(0.50)(0.50)}{(0.05)^2}$$

$$= 384$$

If the target population is less than 10,000, the required sample size should be smaller. The final sample estimate (n_f) using the formula:

$n_f = \frac{n}{1+\frac{n}{N}}$ Where;

n_f = the desired sample size (when the population is less than 10,000),

n = desired sample (when the population is more than 10000)

N = the estimate of the population size.

$$nf = \frac{384}{1 + \frac{384}{714}}$$

$$= 249.7 \approx 250$$

3.6 Sampling Procedures

The study employed stratified sampling, purposive sampling and simple random sampling technique to select a sample for study from a population of 714 class eight pupils in the study area.

Through the assistance of respective schools head teachers, stratified sampling technique separated homogenous subsets that share similar characteristics. Stratified sampling technique was used to select the schools which had environmental clubs and those without environmental clubs in the study area. By contacting the school head teachers by telephone calls the researcher stratified the schools into those with environmental clubs and those without environmental clubs (APPENDIX VIII).

Purposive sampling was used to group learners as either club members or non-club members in primary schools identified to have environmental clubs (APPENDIX IX). Purposive sampling technique collects focused information and therefore there was need to select only useful cases. The club meetings registers were reconciled and pupils who had participated in club activities were categorised as group one and those who had not participated in club activities as group two. This was done with a clear recognition that this method of sampling relies on researchers' judgment regarding the most useful cases. Pupils were further grouped proportionately by academic performance to ensure the sample was not biased towards better or poor performers as it would introduce bias in the study because performance implies intelligence which can affect environmental knowledge (Velma, 2012).

After classifying learners by club membership, performance and gender, simple random sampling was used to select respondents. Counting numbers were placed in a basket and the pupils asked to pick the numbers. Group one pupils were the first to pick followed by group two. Those that chose odd numbers were included in the study (APPENDIX X). This procedure was repeated in all the primary schools and the study obtained its respondents. Simple random sampling technique selects a sample without bias. It ensured that each member of the target population had an equal and independent chance of being included in the sample.

The respondents as categorised by gender and club affiliation. 49.6 percent (n=124) of the respondents were boys and 50.4 percent (n=126) of the respondents were girls. 50 % (n=62) of the boys were club members while the other 50% (n=62) did not subscribe to any club. 46 % (n=58) of the girls were club members while 54% (n=68) were not club members. The study had a total of 250 respondents. The respondents included in the study were provided in Table 3.2.

Table 3.2: Respondents by Club Affiliation and Gender

Category	Boys	Percentage (%)	Girls	Percentage (%)	Total	Percentage (%)
Club Member	62	50	58	46	120	48
Non-Club Member	62	50	68	54	130	52
Total	124	100	126	100	250	100

3.7 Data Collection Instruments

In order to obtain the information about the environmental knowledge, environmental attitude and taking action for the environment, the study used a questionnaire to solicit information from the pupils (Appendix IV). Unstructured interviews were used to acquire information from the patrons of the clubs. The responses obtained from the patrons were

later used to generate the questionnaire for the pupils. The selection for these tools was guided by the nature of the data to be collected, time available as well as the objectives of the study.

A questionnaire is designed to elicit information through written responses from the respondents. The questionnaire used had two sections; part one, covered personal information of the respondents while part two constituted the questions on environmental knowledge, environmental attitudes and taking action for the environmental protection. The questionnaire used contained closed ended questions in which alternatives were provided. Closed ended questions were used because they were easy to tabulate, analyse and were unlikely to be misinterpreted. Studies involving measurement of knowledge and attitudes use instruments that combine measurement of environmental content with opinions or feelings regarding environmental issues (cognitive and affective domain). Attitudinal studies assess learners' environment centred emotional responses or affective domain (Komane, 2005). Questionnaires captured recall of environmental knowledge facts and emotional reactions to environmental concepts presented to the respondents. Questions for attitudes used Likert scales to capture opinions and intentions since affective domain deals with expression of emotions, feelings and opinions. For environmental action the learners were expected to choose from a list of activities they had engaged in voluntarily in the course of their study.

Unstructured interviews for patrons were used because the researcher had already contemplated the topics to be covered. The researcher only prepared a list of topics as a reminder (Appendix V). Unstructured interviews were chosen because of flexibility. It allowed club patrons to respond freely to environmental club issues in a relaxed atmosphere and therefore the answers given were more reliable.

3.8 Data Collection Procedures

The aim of this study was to ascertain the environmental knowledge, attitudes and taking action for environmental protection. The study was concerned with the perceptions, attitudes and actions of the club members and non-club members. Such information could easily be obtained through the use of questionnaires on pupils and interviews for patrons.

The researcher used structured questionnaires which enabled him to obtain quality data on environmental knowledge, environmental attitudes and taking action for environmental protection. Questionnaires were used in the study because some variables could not be directly observed such as attitudes of the respondents. Such information was best obtained through the use of questionnaires. The sample size was also considerably large (n=250) and given the time constraint, questionnaire was the ideal tool. The class 8 pupils were largely literate and were unlikely to have difficulties responding to questionnaires as they were about to sit for Kenya certificate of primary education (KCPE).

Unstructured Interview data collection technique was used to elicit information from patrons. For this study to obtain information about presence or absence of environmental clubs, the researcher interviewed club patrons about environmental club issues. Unstructured interviews also allowed for relaxed atmosphere and therefore the answers given were more reliable. The Interviews allowed the study to obtain historical information that could not directly be observed.

3.8.1 Pre-Testing of Study Instrument

The study instruments were pre-tested among pupils learning in Ciagini and Thome primary schools in adjacent locations of Kirinyaga County outside the study area. The learners in these schools were comparable to the learners in the study schools in terms of socio-economic, demographic characteristics as well as environmental conditions. In Ciagini primary school there was an ongoing environmental club and in Thome primary school there was none. The pre-testing was conducted to establish accuracy of questions in the questionnaire and their clarity. During the pretesting an effort was made to check for consistency in the interpretation of questions and to identify ambiguous items. After a review of the instruments all suggested revisions were made before being administered in the actual study.

3.8.2 Validity

To ascertain that the data collecting instrument measured what they purported to measure, the instruments were validated by the supervisors who evaluated the relevance of each item on a scale of very relevant (4), quite relevant (3), somewhat relevant (2) and not relevant (1). Validity was determined using content validity index (CVI). Items rated 3 or 4 by the two supervisors were divided by the total number of items in the questionnaire.

3.8.3 Reliability

Test retest method was used to estimate the degree to which the same results could be obtained with a repeated measure of accuracy of the same concept in order to determine the reliability of the instruments. The questionnaire was tested again with the pilot group. The results from the tests were evaluated using Pearson's moment product formula in order to establish the extent to which the contents of the questionnaire were consistent in eliciting the same responses every time the instrument was administered. A correlation co-efficient of 0.8 was obtained. This was considered high enough to judge the questionnaire as reliable for the study.

3.9 Data Analysis

When all the data was collected the first stage of data analysis was data cleaning. The questionnaires were examined to ensure they were adequately filled in. The data collected from questionnaires were coded appropriately and transferred to a relevant online calculator for analysis.

T-test and Chi-square were used to establish the relationship and associations between environmental club affiliation and environmental knowledge, attitudes and taking action for environmental protection.

Chi-square analysis technique compared the difference between categorical frequencies after being exposed to environmental clubs to some respondents and non exposure to another set of respondents. Chi-square was used to determine the categorical differences

in environmental attitudes and taking action for environmental protection for the two groups in the study area. The categorical information was presented in form of descriptive statistics of frequencies and percentages.

The attitudes scores were based on Likert scale of unlikely, likely, and definitely. A response of definitely was awarded 3 scores, likely 2 scores and unlikely 1 score. The scores for each question were added together. The frequencies were then expressed as percentages and represented in graphs. For taking action for environmental protection a list of environmental activities were provided on the questionnaire and learners were expected to choose the activities they engaged in voluntarily.

The numbers of respondents per activity were coded as both club members and non-club members. The frequencies were then expressed as percentages and represented on a graph. On further analysis those that chose unlikely were considered to be of negative environmental attitude while those who chose likely and definitely were considered to be of positive environmental attitude. The number of respondents in each category was identified and their results given as percentages.

Chi-square was used to test the significance of the results obtained. Chi-square was used to compare the difference between categorical frequencies drawn from club members and non-club members on environmental attitudes. Chi-square was considered appropriate because it deals with frequencies and not scores for the two independent variables. Data collected were analysed at 0.05 confidence level. The value makes the study 95 percent confident that any difference noticed were due to environmental club participation and not a matter of chance. In 100 percent cases 5 percent could be due to chance (Oso and Onen, 2009). An online calculator analysis was used and it gave the chi-square value and also the actual computed chi-square value. When the probability of the computed chi-square value was less than the level of significance set, the conclusion was that the null hypothesis be adopted and if it was greater than the level of significance the conclusion was that the null hypothesis be rejected.

T-test analysis technique was used to compare the differences between means of knowledge scores for environmental club members and non-club members. Also Gender

scores on environmental knowledge were analysed using t-test analysis technique. T-test was appropriate for these independent variables because the study dealt with group average and not individual scores. Data about knowledge was analysed by summing up the total score for all the learners who were club members and the total score for those who were not club members separately. Data was analysed at significance level of 0.05. If the t-test value was found greater than the critical value, the null hypothesis was rejected and the conclusion was that there was significant difference among the variables. Where the t-value was less than the critical value then the null hypothesis was adopted implying that there was no significant difference between the variables.

Percentages were used to compare the differences in taking action for environmental protection aspect of environmental awareness. The study computed and discussed the differences as depicted by the obtained percentages.

3.10 Logistical and Ethical Considerations

Clearance to conduct the study was obtained from graduate school Kenyatta University. Informed consent was obtained from primary school head teachers, club patrons and pupils before the study objectives and methodologies were explained to them. Study respondents provided consent prior to participating in the study and participation was completely on voluntary basis (Appendix I and II). Respondents were assured that the data collected was for research purposes only and would be treated with utmost confidentiality.

CHAPTER FOUR:

RESULTS AND DISCUSSIONS

4.1: Introduction

This chapter presents and discusses the results obtained. An analysis of answers provided was done and the results discussed.

4.2: Club Affiliation in Relation to Environmental Knowledge

The learners were evaluated on environmental knowledge by engaging them in environmental knowledge questions whose content was covered during environmental clubs discussions and in classrooms discussions. The environmental knowledge questions are in the questionnaire provided in appendix IV. Those who scored 5 out of 6 or 6 out of 6 were awarded 3 points, those who scored 3 out of 6 or 4 out of 6 were awarded 2 points while those who scored 0 out of 6, 1 out of 6 and 2 out of 6 were awarded 1 point. The points were used in analysis of environmental knowledge. Table 4.1 shows the club members and non-club members and the number of points they were awarded. The percentages were also given.

Table 4.1: Knowledge Scores

Points Awarded	Club Members	Percentage (%)	Non-Club Members	Percentage (%)
3	102	85	85	65
2	12	10	26	20
1	6	5	19	15

From Table 4.1, 85 percent of club members scored 3 points compared to 65 percent of non-club members. 10 percent of club members scored 2 points compared to 20 percent of non-club members. Only 5 percent of club members scored 1 point compared to 15 percent of non club members. Those who scored 3 points were considered to be of high

environmental knowledge, 2 points moderate environmental knowledge and 1 point low environmental knowledge. T-test data analysis technique was used to evaluate the significance of the results obtained. The results are provided in Table 4.2;

Table 4.2: t-test on club affiliation and environmental knowledge

Variable	n	Mean	Standard Deviation	t-Test	Significance
Club Members	120	2.8000	0.51204	3.66	Significant
Non Club Members	130	2.5077	0.73922		

The calculated t-value was 3.66 which was higher than 1.96, the t-value at $p \geq 0.05$. Since the calculated value was higher than the table value the null hypothesis was rejected and alternative hypothesis adopted that; environmental clubs members, environmental knowledge is different from that of non-club members.

The results of the present study are consistent with the hypothesis of the study that environmental club members posses more environmental knowledge than non club members. Studies conducted elsewhere with high school learners and elementary school pupils indicated that involvement in outdoor activities provide learners with a deeper understanding of natural environment and developed their own environmental knowledge (Erdoğan *et al.* 2010). Fančovičová and Prokop (2011) asserted that outdoor activities provide hands-on activities that enable the pupils to integrate theory and practice, and to have cognitive attainments. Where active learning method and techniques are employed and learners become central to the process and teachers assume the role of guide, there is great contributions to the environmental knowledge within the framework of environmental education. Bakers (2008) argued that pupils who were involved in extracurricular activities during college life were more academically successful than those who are not. Robyn (2008) posits that pupils who participate in peer support

programmes as peer supporters or mentors develop valuable skills and attributes. Bogner (2002) found that frequent visits to outdoor educational settings increases children's environmental knowledge towards nature. However, most of these studies were done with higher education learners but there was little study about activities in primary schools which this study addressed.

4.3. Club Affiliation in Relation to Environmental Attitude

The study sought to establish the influence environmental clubs had on environmental attitudes of the respondents. Attitudinal questions sought the opinions of the respondents on these aspects; visual pollution, environmental aesthetics, environmental problems, environment future and waste disposal by burning. The questions responses were given on a Likert scale of unlikely (1), likely (2), and definitely (3). In question 11 and 13, scoring was such that the response unlikely had 3 point, likely 2 point and definitely had 1 point. Respondents who chose unlikely were considered to be of negative environmental attitude while those who chose likely and definitely were considered to be of positive environmental attitude. In questions 9, 10 and 12 those who opted for unlikely were classified as having positive environmental attitude and those who chose likely and definitely were considered to be of negative environmental attitude. The number of respondents in each category was identified and their results given. Chi-square was used to test the significance of the results obtained. The percentages of attitudes of club members and non-club members are provided in Figure 4.1

The first question sought respondents' opinion on visual pollution. 96.5 percent of the club members agreed with the statement that they would clear unnecessary writings on the walls therefore they were considered to have positive environmental attitude towards visual pollution. 3.5 percent of the club members were identified to have negative environmental attitude. 85 percent of the non-club members had positive environmental attitude while 15 percent of the non-club members had negative environmental attitude. Chi-square was used to determine whether the attitudes difference between club members and non-club members were different. The results obtained were χ^2= 18.452, df = 2,

$p \geq 0.05$ and it appeared that environmental attitudes on visual pollution were dependent on whether one is an environmental club member or not.

The second question sought respondent's response in connection with improving environmental aesthetic at the school compound. From the responses obtained 86 percent of the club members had positive attitude on improving environmental aesthetics in the school compound while 14 percent had negative attitude about the same. 85 percent of non-club members had positive attitudes on environmental aesthetics against 15 percent who had negative attitudes towards environmental aesthetic. When chi-square was used to determine the relevance of the results obtained, the results obtained were $\chi^2 = 8.755$, df=2, $p \geq 0.05$ and it appeared that environmental aesthetics opinions were independent of environmental club membership.

88 percent of club members had positive attitudes towards finding solutions to environmental problems and 12 percent had negative attitudes towards finding solutions to environmental problems. For the non-club members, 58 percent had positive attitude towards finding solutions to environmental problems while 42 percent had negative attitude towards finding solutions to environmental problems. Given that the chi-square results were $\chi^2 = 8.838$, df=2, $p \geq 0.05$, it appeared that attitudes towards finding solutions to environmental problems were independent to environmental club membership.

The fourth question sought the learners' attitudes on the environmental conditions for the future. 78 percent of the club members had positive attitude on the future conditions of the environment while 22 percent of club members had negative attitude on the future conditions of the environment. 20 percent of the non club members had positive attitude towards the future of the living conditions in their school while 80 percent had negative attitude towards the future of the living conditions in their school. Given that the chi-square values obtained were $\chi 2 = 87.718$, df=2, $p \geq 0.05$, it appears that the respondent's attitude to the future for the environment was dependent to environmental club membership. The results agree with Eckersleys (1999) findings that young people temper their enthusiasm for the environment with pessimism and 'action paralysis' in regard to

future. It is possible that these feelings of frustrations lead to a certain level of apathy for the environment.

The last question on environmental attitude sought pupils understanding on waste disposal by burning thereby increasing pollution. 67 percent of club members would not dispose garbage by burning therefore it was alluded that they had positive attitude towards disposing of garbage by burning while 33 percent had negative attitude towards disposing of garbage by burning. 21 percent of non-club members had positive attitude towards disposing of garbage by burning while 79 percent had negative attitude towards disposing of garbage by burning. Chi-square value obtained being $\chi 2 = 57.519$, df =2, $p \geq 0.05$it appeared that environmental attitude on waste disposal by burning was dependent on whether one was a club member or not.

On environmental club affiliation and environmental attitudes the study found three cases where environmental club members had positive environmental attitudes against those who did not subscribe to any environmental club. Therefore, the study found that environmental clubs affiliation had some influence on environmental attitudes.

The results of the present study are consistent with the hypothesis that environmental club members have more positive environmental attitudes aspects than non club members. Lyons and Breakwell (1994) concluded in their study that it is possible for scientific knowledge to raise environmental awareness of environmental problems as well as the possible solutions. They assert that learners who score highly in tests of knowledge are more receptive on information and have thought about those facts than those who score lowly. These study findings agree with results of Passey, *et al* (2010) that participating in environmental club activities like school gardens influences on pupils' good environmental attitudes. Fancovicova and Prokop (2011) had found that environmental programmes influences pupils' attitudes towards plants. Bogner (2002) found that frequent visits to outdoor educational settings increases children's environmental attitudes towards nature. These results provide evidence that participating in environmental clubs meaningfully improves pupils' views on environment. Thus, this study is an addition on the beneficial effects of environmental club programmes on attitude of learners.

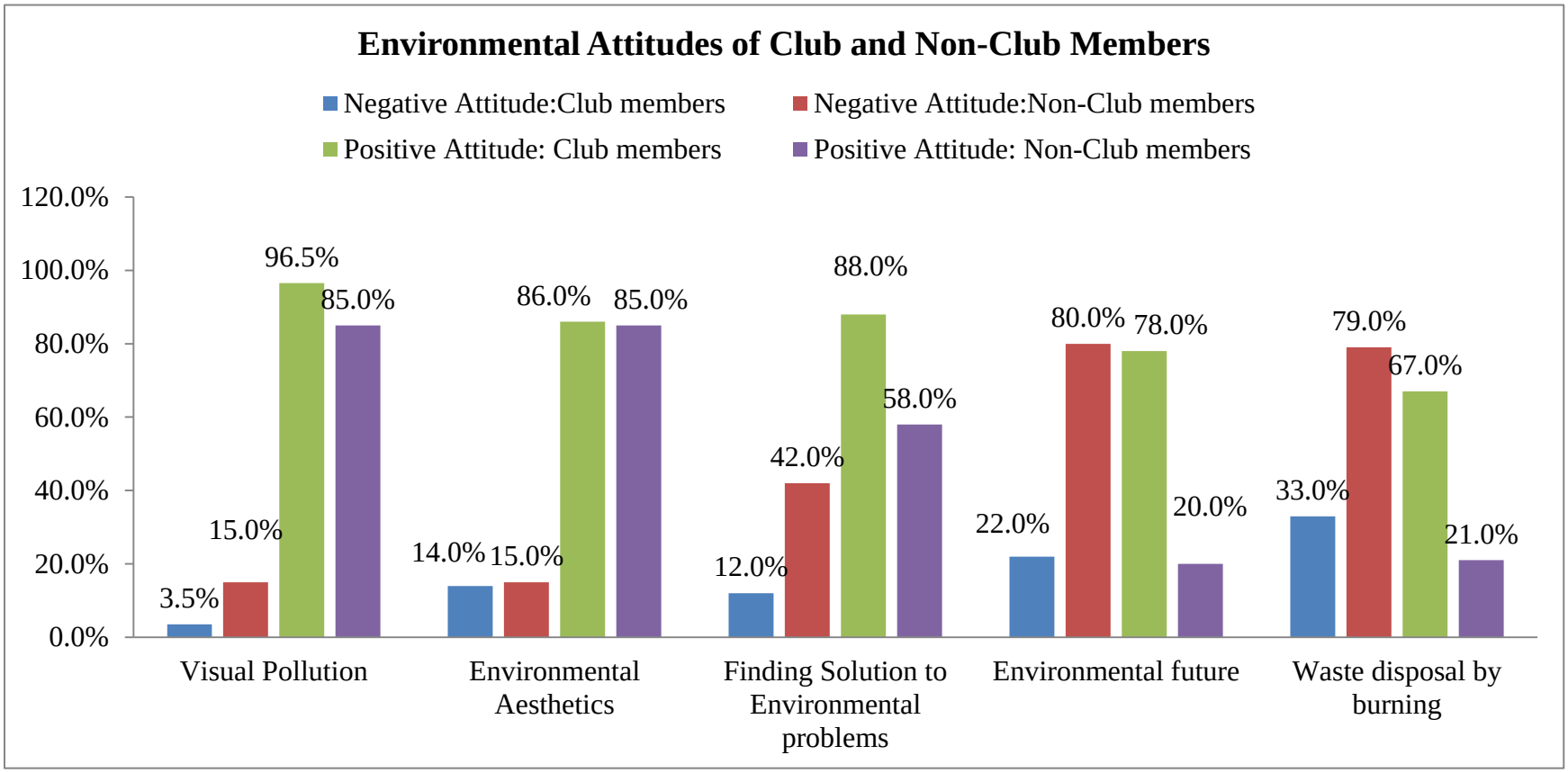

Figure 4.1: Environmental Attitudes of respondents

4.4: Taking Action for the Environment in Relation to Club Affiliation

The club patrons had provided a list of activities that pupils engage in during the environmental club activities session in their respective schools in an unstructured interview (Appendix V). The list was summarised into four areas as shown in Appendix VIII. Respondents were to tick activities they had engaged in voluntarily for environmental protection. The activities were categorised into controlling visual pollution, taking environmental health and safety measures, improving environmental aesthetics and conserving resources. During analysis the number of respondents who chose a given activity were identified and represented as percentages as in Table 4.5.

Table 4.6: Activities Involvement by Club Affiliation

Activity Classification	Club Members	%	Non-Club Members	%	Totals	%
Controlling visual pollution.	76	63	44	37	120	100
Taking environmental health and safety measures.	111	56	88	44	199	100
Improving environmental aesthetics.	91	52	83	48	174	100
Conserving resources.	114	55	92	45	206	100

The number of respondents who selected the activities were categorised as club members and non-club members. The percentages of club members and non-club members were also given.

The percentage of club members and non-club members shows that in controlling visual pollution, clubs members had 63 percent against non-club members who had 37 percent, in taking environmental health and safety measures**,** environmental club members had 56 percent participation while non-club member's had 44 percent, On improving

environmental aesthetics, club members had 52 percent against non-club member's participation which stood at 48 percent and on conserving resources in the school compound, club member's participation recorded 55 percent against non-club members who scored 45 percent.

The study found that being an environmental club member predisposed one to taking active role in activities aimed at protecting the environment than when one is not an environmental club member. The results of this study are consistent with the study hypothesis that environmental club members are more willing to participate in nature activities than non club members. The result obtained agreed with those of Dhavan (2012) that pupils of eco-club had more awareness on taking action towards environment than non-eco club learners.

4.5: Gender Affiliation and Environmental Knowledge

In order to establish whether gender had any influence on environmental knowledge, the respondents were categorised by gender. The Table 4.3 shows the number of boys and girls and how they scored. There were six questions on environmental knowledge as provided in the questionnaire (Appendix IV). Those who scored 5 out of 6 or 6 out of 6 were awarded 3 points, those who scored 3 out of 6 or 4 out of 6 questions correctly were awarded 2 points and those who scored 0 out of 6, 1 out of 6 and 2 out of 6 were awarded 1 point.

124 boys and 126 girls were subjected to some environmental questions of which 75 percent (n=93) boys scored 3 points against 75 percent girls. 15 percent (n=18) of boys scored 2 points against 16 percent girls (n=20). 10 percent boys (n=13) scored 1 point against 9 percent girls (n=12). Those who scored 3 points were considered to be of high environmental knowledge, 2 points moderate environmental knowledge and 1 point low environmental knowledge.

Table 4.3: Knowledge Scores by Gender

Points Awarded	Boys	Percentage (%)	Girls	Percentage (%)
3	93	75	94	75
2	18	15	20	16
1	13	10	12	9

The points obtained were later subjected to t-test analysis to establish the relationship between boys and girls in the study area with reference to environmental knowledge. Table 4.4 shows the results obtained.

Table 4.4: t-test on gender and environmental knowledge

Variable	n	Mean	Standard Deviation	t-Test	Significance
Boys	124	2.645	0.66496	0.07219	Not Significant
Girls	126	2.651	0.64891		

The t-value obtained from the results was 0.07219 which was below t-value 1.96 at $p \geq 0.05$. This called for adoption of the null hypothesis that gender did not influence environmental knowledge of respondents in the study area.

The results of the current study were inconsistent with the hypothesis that females are more knowledgeable than males in environmental matters. Socialization theory directs girls towards a care giving role which enable them to be more protective, nurturing and cooperative than boys. According to UNDP (2004) women possess more environmental knowledge and skills that guides finding solutions for environmental degradation, deforestation pollution and overpopulation. However, the results of this study were

consistent with the results of Stagner (2014) which found no difference in boys and girls knowledge after an exposure to an environmental programme in Portland, Oregon. Gender differences are not evident among infants but as children get old social worlds of males and females are distinguished in many ways (Kanyi *et al*, 2011). The study results agree with Fancovicova and Prokop (2011), that there exist no differences between boys and girls when plant knowledge is investigated.

4.5.1 Gender in Relation to Environmental Attitude

The study sought for the influence gender has on environmental attitudes. Attitudinal questions were posited to the respondents on visual pollution, environmental aesthetic, environmental problems, environment future and waste disposal by burning. The questions responses were on a Likert scale of unlikely (1 point), likely (2 points), and definitely (3 points). In question 11 and 13 the scoring was such that response 'unlikely' had 3 points and 'definitely' had 1 point. The respondents who chose unlikely were considered to be having poor environmental attitude while those who chose likely and definitely were considered to be having good environmental attitude. The percentage of boys and girls who had either good or poor environmental attitudes is given in Figure 4.2.

The first question looked into the relationship of boys and girls and attitudes towards visual pollution. The percentage of boys and girls who possessed good attitude towards controlling visual pollution was at 93 percent in boys and 91 percent in girls. Those who had negative attitude on controlling visual pollution were 7 percent for boys and 9 percent for girls. The chi-square values obtained were $\chi 2 = 0.071$, $df = 2$, $p \geq 0.05$ and it appeared that gender of respondent had no influence on environmental attitude towards visual pollution.

On attitudes about maintaining environmental aesthetic in the school compound the study found the percentage of boys with good environmental attitude to be 92 percent while for girls to be 79 percent. Poor attitudes were at 8 percent for boys and 21 percent for girls. The chi-square test values obtained were $\chi 2 = 10.542$, $df = 2$, $p \geq 0.05$. From these results it appeared that gender of the respondents had some influence on environmental attitudes towards the aesthetics of the school compound.

On attitudes towards finding solutions to environmental problems, the responses were; 87 percent boys and 81 percent girls had good environmental attitudes towards finding solutions to environmental problems. 13 percent of boys had poor environmental attitudes towards finding solutions to environmental problems and 19 percent of the girls. The Chi-square results obtained were $\chi 2 = 3.197$, $df = 2$, $p \geq 0.05$. From the results obtained it appeared that gender had no influence on boys and girls attitudes towards finding solutions to environmental problems.

The learner's attitude towards the future of the environment was also tested. 44 percent of boys had good attitude towards environmental future of their school environment while 56 percent of the boys had poor attitude towards the future of the school environment. 52 percent of the girls had good attitudes towards the future of their school environment while 48 percent had poor attitude towards the same. When exposed to chi-test, the results obtained were $\chi 2 = 4.125$, $df = 2$, $p \geq 0.05$. The results showed no significant difference between boys and girls in the attitude towards environmental future of their school environment.

In order to establish whether learners were conscious of garbage disposal by burning and pollution thereby, the results obtained indicated 49 percent of the boys and 36 percent of the girls had good environmental attitude towards environmental pollution. However, 51 percent of the boys and 64 percent of the girls had poor attitude towards burning garbage as a method of refuse disposal. The chi test values obtained were $\chi 2 = 9.077$, $df = 2$, $p \geq 0.05$ and it appears that garbage disposal by burning was gender independent. Waste management is an environmental concern in Kenya due to poor waste management practices. It is contended that participation of communities in awareness could play a crucial role in waste management since environmental awareness is still low among Kenyan communities (Mwangangi, 2012).

The study found four cases where environmental attitudes differences between boys and girls were insignificant. From the results then, the study found that environmental attitudes of the respondents were gender independent.

The results of the current study are inconsistent with the hypothesis that females possess better environmental attitudes than males. Socialization theory directs girls towards a care giving role which enable them to be more protective, nurturing and cooperative than boys. The findings of this study however, agrees results obtained by Eagle and Demare's (1999) and also by Kellet (1985), that there are no significant differences between boys and girls in ecological attitude scores to learners in primary schools.

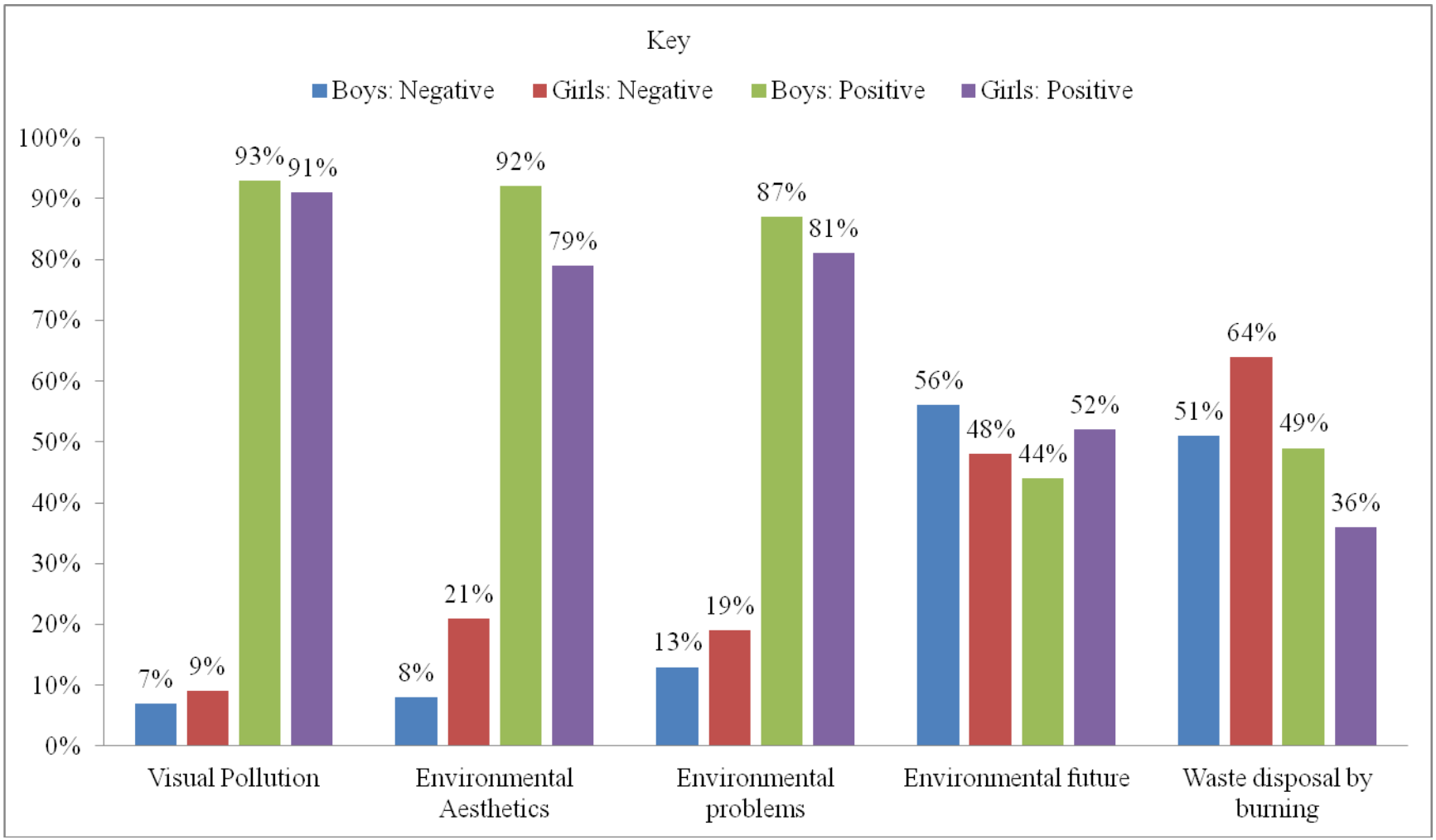

Figure 4.2: Environmental Attitudes relationship with gender

4.5.2 Taking Action for the Environment in Relation To Gender

The data on environmental activities for environmental protection were classified according to gender of respondents. The study sought for differences in activities boys and girls engage in for environmental protection. The activities categories were controlling visual pollution, taking environmental health and safety measures, improving environmental aesthetics and conserving resources. The numbers of boys and girls who selected each activity are shown in Table 4.6.

In controlling visual pollution, the percentage of girls who participated in the activity were 65 percent against that of boys which stood at 35 percent, and in taking action for environmental health and safety measures, the percentage for girls was 61 percent against 39 percent for boys. On improving environmental aesthetics, the percentages for boys and girls were 37 percent and 63 percent respectively. In conserving environmental resources, boy's participation stood at 53 percent against 47 percent for girls.

Table 4.7: Activities Involvement by Gender of Respondents

Activity Classification	Boys	%	Girls	%	Total	%
Controlling visual pollution.	42	35	78	65	120	100
Taking environmental health and safety measures.	78	39	121	61	199	100
Improving environmental aesthetics.	64	37	110	63	174	100
Conserving resources.	109	53	97	47	206	100

From the percentages obtained in the study, it appeared that girl's participation in activities that involved environmental protection was better than in boys in the study area. These findings are consistent with the study hypothesis that females are more active in environmental activities than males. Women prominence in activities of the nature can be explained by Chipko movement. Indian women resisted men who were clearing forest (www.ecoindia.com/education/chipkomovement.html). The results agrees with results obtained by Zelezny *et al*. (2000) who found girls to be more concerned for the environment and exhibited more pro-environmental tendencies than

boys. Females have stronger environmental actions than male and express greater concerns for the biosphere (ibid).

CHAPTER FIVE:
CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

This study established that:

Environmental knowledge competences of environmental club members were higher than environmental knowledge competences of non club members.

Environmental attitudes of environmental club members were more positive than environmental attitudes of non club members.

Environmental club members used to participate more in activities geared towards environmental protection than non club members.

Lastly, Environmental knowledge competences and attitudes of respondents were found to be gender independent but taking action for environmental protection was found to be gender dependent.

5.2 Conclusions

The study therefore concludes that:

When learners participate in environmental clubs activities their environmental knowledge competences are improved possibly due to exposure gained from interaction with the nature.

Positive outcomes in attitudes are experienced when learners participate in environmental clubs than when they do not participate; possibly due to regular voluntary interactions with the environment.

Pupils who were environmental club members were more likely to continue engaging in environmental activities geared towards environmental protection than pupils who were not environmental club members.

Gender of the respondents was found to have little influence on environmental knowledge and environmental attitudes. However, girls were found to be participating in environmental activities that protect the environment more than boys. Gender

disparity is not very pronounced in the study area and this could possibly be attributed to changing roles where boys and girls are being given equal opportunities in education forums or interference from the intervening variables like knowledge and attitudes acquired from mass media and environmental education contents infused in the curriculum.

The study offers support that engaging in voluntary environmental groups comprising of learners and teachers (club patrons) in a school can promote participation of pupils in learning about and working towards the conservation and sustainability of the environment. With the support of respective school management and other interested stakeholders, the clubs movement can create awareness about the environmental related issues which threaten the existence of the ecosystems.

5.3 Recommendation

The study recommends as follow:

(i) The government through the ministry of education should come up with a policy that encourages clubs in schools. Further, the government should implement the environmental policies that are already in place but ineffective for example ensuring a healthy environment for all which is a pillar in the Kenya's Vision 2030.

(ii) Environmental activities need to be encouraged in schools and outside the school gatherings irrespective of gender. Every school need to come up with it specific environmental policy, implement it and ensure all learners belong to at least one environmental club.

(iii) Since the school offer conducive environment for exposure to environmental activities that promote environmental awareness, there is need to train teachers who are patrons of various clubs so that they become more knowledgeable on environmental matters. Further, the ministry of education should consider rewarding them through promotion for exemplary participation in club activities.

(iv) Other than clubs, other sources of environmental information like mass media, curriculum infused content need to be encouraged.

5.4 Areas for future research

The study proposes research on:

(i) A replication of the study with higher learning institutions students in order to validate or show variability of these research findings.

(ii) Extent to which infused content of EE and mass media influences environmental awareness.

(iii) Given the changing demographics in a developing country like Kenya, it is worth investigating the influence environmental education programmes have in different environments like rural and urban set-ups. Variables like polluted versus unpolluted environments and rural versus urban settings may provide a greater understanding of club members' characteristics and how they relate to outcome measure like environmental awareness.

(iv) Teacher's contribution towards clubs should be carried out to determine the role they play in enhancing environmental awareness through clubs.

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APPENDICES

Appendix I: Letter to the Respondents

James Mutugi Gakuo,

Kenyatta University

Dept of Environmental Education

P.O. Box 43844-00100 Nairobi,
Tel: 0721554789

Dear respondent

RE: REQUEST TO FILL THE QUESTIONNAIRE FOR RESEARCH PURPOSE

This is to request you to fill the attached questionnaire for research purpose in partial fulfillment of the degree of Master of Science (Environmental Education) of Kenyatta University. The research focuses on the Influence of Environmental Clubs on Pupils' Environmental Awareness: A Study in Primary Schools in Mwea Division, Embu County, Kenya

The information sought from you will be treated with utmost confidence, and results of this study will be available for your use/ reference on request. Please answer all the questions in the spaces provided. Where the space is not enough, use the space at the back of the respective page.

Your cooperation will be highly appreciated.

Thank you.

Yours sincerely,

James Mutugi Gakuo

(Student K.U)

Appendix II: Letter of Introduction

James Mutugi Gakuo

Kenyatta University
Dept of Environmental Education
P.O. Box 43844-00100 Nairobi, Kenya
Tel: 0721554789

The Head Teacher

Dear Sir/ Madam,

RE: PUPILS QUESTIONNAIRE ON ENVIRONMENTAL ISSUES

This letter is request to you, to allow me to visit your school with a set of questionnaires for a sample of your pupils to answer. I intend to take only 20 minutes of your pupil's time during your clubs day on ---------- October 2014 tentatively. Please let me know if that day is convenient for you through my mobile No.0721554789.

I will appreciate any assistance you give me, to make my research a success.

Thank you,

Yours sincerely
James Mutugi Gakuo
(Student K.U)

Appendix III: Permission to Collect Data; Letter from the Graduate School

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: N50/CE/22646/2010

DATE: 10th November, 2012

The Permanent Secretary,
Ministry of Higher Education, Science & Technology,
P.O. Box 30040,
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR JAMES MUTUGI GAKUO– REG. NO. N50/CE/22646/2010

I write to introduce Mr. James Mutugi Gakuo who is a Postgraduate Student of this University. He is registered for M.Env degree programme in the Department Environmental Education.

Mr. Gakuo intends to conduct research for a proposal entitled, "**The Impact of Environmental Clubs on Environmental Awareness of Pupils in Selected Primary Schools in Mwea Division, Embu County, Kenya**"

Any assistance given will be highly appreciated.

Yours faithfully,

12 NOV 2012

MRS. LUCY N. MBAABU
FOR: DEAN, GRADUATE SCHOOL

LNM/rwai

Appendix IV: Questionnaire for Pupils

Instructions to the respondent

Answer all the questions in the spaces provided. Tick or circle the correct response(s).

SECTION A

1. Indicate your Gender.

Boy	
Girl	

2. Do you belong to a club within your school where people work with others for the environment?

Yes	
No	

SECTION B

Please answer the following questions by writing the best answer. You won't be graded on this test.

3. How can we keep off mosquitoes from our environment?
   a) Clearing unwanted drawings on the wall
   b) Slashing grass and bushes from our dwelling places
   c) Planting flowers in the compound
   d) Boiling drinking water
4. Soil erosion can be prevented by
   a) Increasing bird population
   b) Afforestation
   c) Removal of vegetation
   d) Overgrazing
5. What happens if we move larger amounts of animals or plants into a new environment?
   a) This is good for biological diversity.
   b) With this we enrich the food chain.
   c) We destroy the ecological balance.
   d) I don't know
6. What is the meaning of the concept "endangered species"?
   a) Animals or plants which have lived in the past

b) Just a limited number of individuals of this species are alive

c) This animal or plant has replaced other species

d) None of the above

7. Which of the following activities will ensure our future generations meet the environment healthy?

   a) Cleaning our classrooms

   b) Pruning hedges

   c) Planting trees

   d) Clearing cobwebs

8. The green plants are also called:

   a) Producers

   b) Consumers

   c) Decomposers

   d) None of the above

Please circle the number that best matches your feelings for the following statements. Circle ONLY ONE per statement.

9. It is my personal responsibility to help clear unwanted drawings on the walls.

   1. Unlikely

   2. Likely

   3. Definitely

10. I think we can make our school compound beautiful by planting more flowers.

    1. Unlikely

    2. Likely

    3. Definitely

11. The living conditions in our school will be worse in the future.

    1. Unlikely

    2. Likely

    3. Definitely

12. I often think about environmental problems?

    1. Unlikely

    2. Likely

    3. Definitely

13. In your school, would you engage in a voluntary action of burning garbage in a compost pit?
    1. Unlikely
    2. Likely
    3. Definitely
14. Identify an environmental activity that you have ever engaged in while in school voluntarily.

Activity	**Tick**
Clearing cobwebs	
Clearing rubbish/garbage	
Clearing unwanted drawings on walls/graffiti	
Clearing abandoned materials/derelict	
Slashing grass/bush	
Cleaning classrooms,	
Boiling drinking water	
Cleaning toilets	
Planting flowers	
Caring for flower beds	
Landscaping	
Pruning hedges	
Planting trees	
Caring for trees	
Conserving soil	
Conserving water	

Appendix V: Unstructured Interview Questions

1. Which clubs do exist in your school?

2. Is it compulsory for every pupil to join a club?

3. Does the administration support the activities of clubs?

4. Identify club activities in your school

5. In your opinion do clubs play any significant role in enhancing environmental awareness?

Appendix VI: Answers to Multiple Questions on Environmental Knowledge

3. (b), 4. (b), 5. (c), 6. (b), 7. (c), 8. (a)

Appendix VII: Class 8 Population in the Study Area

Name of the Primary School	Boys	Girls	Totals
Karaba Primary	13	21	34
Aic Wango	15	16	31
Gitaraka	13	17	30
Makutano	35	33	68
Iriaitune	28	28	56
Kikumini	21	16	37
Kamweli	11	10	21
Maviani	9	17	26
Consolata Karaba	20	23	43
Wakalia	18	12	30
Karuku	12	15	27
Kaseveni	6	14	20
Makawani	14	14	28
Kathiani	13	12	25
Riakanau	7	7	14
Ngomola	2	6	8
Consolata Kilia	10	10	20
Gategi Pry	15	7	22
Kamwiendei	12	10	22
Ack Kilia	12	8	20
Kaseve	7	12	19
Koma	11	7	18
Nthingini	8	9	17
Malikini	19	15	34
Kakindu	8	10	18
Musingini	16	10	26
Totals	*355*	*359*	*714*

Appendix VIII: List of Activities of Pupils in Environmental Clubs

Activity Classification	Activities involved
Controlling visual pollution	Clearing cobwebs
	Clearing rubbish/garbage
	Clearing unwanted drawings on walls/graffiti
	Clearing abandoned materials/derelict
Taking environmental health and safety measures	Slashing grass/bush
	Cleaning classrooms,
	Boiling drinking water
	Cleaning toilets
Improving environmental aesthetics	Planting flowers
	Caring for flower beds
	Landscaping
	Pruning hedges
Conserving resources	Planting trees
	Caring for trees
	Conserving soil
	Conserving water

Appendix IX: Club Status in the Primary Schools in the Study Area

Primary School	Club Present/Absent	School	Club Present/Absent
Karaba Pry	Yes	Makawani	No
Aic Wango	No	Kathiani	Yes
Gitaraka	No	Riakanau	No
Makutano	Yes	Ngomola	No
Iriaitune	Yes	Consolata Kilia	Yes
Kikumini	No	Gategi Pry	Yes
Kamweli	Yes	Kamwiendei	No
Maviani	No	Ack Kilia	Yes
Consolata Karaba	Yes	Kaseve	No
Wakalia	No	Koma	No
Karuku	No	Nthingini	No
Kaseveni	No	Malikini	No
Musingini	Yes	Kakindu	No

Key:

Yes – a club exist

No - a club does not exist

Appendix X: Club and Non- Club Members from Schools in the Study Area

	Club Members		Non Club Members	
	Boys	Girls	Boys	Girls
Primary Schools				
Karaba Primary	10	14	3	7
Makutano primary	24	24	11	9
Iria Itune primary	20	20	8	8
Kamweli primary	8	8	3	2
Consolata Karaba	14	16	6	7
Kathiani Primary	10	8	3	4
Consolata Kilia	8	8	2	2
Gategi Primary	10	4	5	3
Ack Kilia	8	6	4	2
Musingini	12	8	4	2

Appendix XI: Respondents for the Study

School Name	Club Member Boys	Non-Club Boys	Club Member Girls	Non-Club Girls	Totals
Karaba Pry	5		7		12
Aic Wango		5		6	11
Gitaraka		5		6	11
Makutano	12		12		24
Iriaitune	10		10		20
Kikumini		7		6	13
Kamweli	4		4		8
Maviani		3		6	9
Consolata Karaba	7		8		15
Wakalia		6		4	10
Karuku		4		4	8
Makawani		5		5	10
Kathiani	5		4		9
Riakanau		2		2	4
Ngomola		1		2	3
Consolata Kilia	4		4		8
Gategi Pry	5		2		7
Kamwiendei		4		4	8
Ack Kilia	4		3		7
Kaseve		2		4	6
Koma		3		2	5
Nthingini		3		3	6
Malikini		7		5	12
Kakindu		3		4	7
Musingini	6		4		10
Totals	**62**	**62**	**58**	**68**	**250**