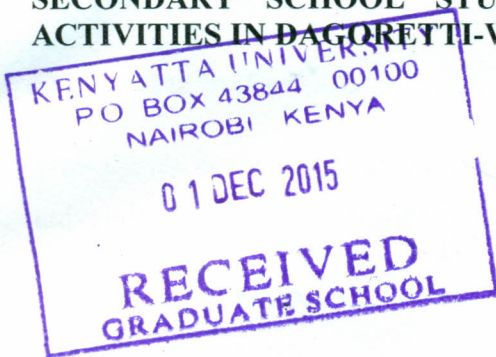


**FACTORS INFLUENCING AWARENESS AND PARTICIPATION OF
SECONDARY SCHOOL STUDENTS IN ENVIRONMENTAL EDUCATION
ACTIVITIES IN DAGORETTI-WEST SUB-COUNTY, KENYA**



By

Kinyi Emily Irene Njeri (B.Ed. Sp. Ed.)

N50/CE/14490/2009

A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of the Degree
of Master of Environmental Science (Environmental Education) in the School of
Environmental Studies of Kenyatta University

September, 2015

KENYATTA UNIVERSITY LIBRARY

DECLARATION

Declaration by Candidate:

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

Kinyi Emily Irene Njeri

N50/CE/14490/2009

Signature: -----

Date: 15/November, 2015-----

Declaration by Supervisors

I/We confirm that the work reported is original work and it has not been submitted to any other university for the award of ant other degree.

Dr. John Muriuki

Department of Environmental Education

Signature: -----

Date: 28/11/2015-----

Dr. James K.A Koske

Department of Environmental Education

Signature: -----

Date: 28/11/2015-----

DEDICATION

This work is dedicated to my husband John Kinyi, my daughters and my supervisors. You are my pillar of strength and encouragement. May God grant you peace, good health and long life.

ACKNOWLEDGEMENT

I thank God the almighty for the gift of life, health, strength and protection that I have received throughout my studies. The success of this study has been the result of a combined effort, support and cooperation from several people to whom I owe a lot of gratitude. First and foremost, I owe it to my supervisors Dr. John Muriuki and Dr. James Koske for their professional advice and guidance throughout my research. I wish to acknowledge my lecturers from the Department of Environmental Education in the school of environmental studies for their effort and encouragement throughout my studies. I wish to acknowledge the Kenyatta University administration and community at large through whom I got conducive learning environment.

May God bless you all.

TABLE OF CONTENTS

DECLARATION	II
DEDICATION	III
ACKNOWLEDGEMENT	IV
LIST OF TABLES.....	IX
LIST OF FIGURES.....	X
LIST OF ABBREVIATIONS AND ACRONYMS.....	XI
DEFINITION OF TERMS	XII
ABSTRACT.....	XIII
CHAPTER ONE: INTRODUCTION.....	1
1.1 PREVIEW	1
1.2 BACKGROUND OF THE STUDY	1
1.3 PROBLEM STATEMENT	5
1.4 JUSTIFICATION OF THE STUDY.....	6
1.5 RESEARCH QUESTIONS	7
1.6 MAIN OBJECTIVE.....	7
1.6.1 <i>Specific Objectives</i>	7
1.7 HYPOTHESES.....	8
1.8 CONCEPTUAL FRAMEWORK	8
1.9 LIMITATION	9
CHAPTER TWO: LITERATURE REVIEW.....	10
2.1 INTRODUCTION	10
2.2 GLOBAL ENVIRONMENTAL EDUCATION.....	10
2.2.1 <i>Environmental Education in Norway</i>	12

2.2.2 <i>Environmental Education in Malta</i>	13
2.2.3 <i>Environmental Education in Children</i>	14
2.2.4 <i>Environmental Awareness and the Public</i>	15
2.2.5 <i>Effective Use of Media Outlets</i>	16
2.3 ENVIRONMENTAL AWARENESS	17
2.3.1 <i>Public Environmental Awareness and Education</i>	18
2.4 ENVIRONMENTAL EDUCATION IN KENYA	19
2.5 ENVIRONMENTAL AWARENESS AMONG THE TEACHERS AND STUDENTS	21
2.6 PARTICIPATION IN ENVIRONMENTAL ACTIVITIES	22
2.7 ENVIRONMENTAL EDUCATION ACTIVITIES/PROJECTS THAT EXIST IN SECONDARY SCHOOLS AND FACTORS THAT HINDER THEIR DELIVERY	23
2.8 RELATIONSHIP BETWEEN TEACHERS' AWARENESS OF ENVIRONMENTAL EDUCATION AND STUDENTS' UNDERSTANDING OF ENVIRONMENTAL ASPECTS	26
2.9 ENHANCING ENVIRONMENTAL EDUCATION ACTIVITIES IN SECONDARY SCHOOLS	27
CHAPTER THREE: RESEARCH METHODOLOGY	29
3.1: INTRODUCTION	29
3.2 STUDY AREA.....	29
3.3 RESEARCH DESIGN	30
3.3.1 <i>Target Population</i>	30
3.3.2 <i>Sample size estimate</i>	32
3.4 RESEARCH INSTRUMENTS	34
3.5 PILOTING OF RESEARCH INSTRUMENTS	34
3.6 DATA ANALYSIS	34
CHAPTER FOUR: RESULTS AND DISCUSSIONS.....	35
4.1: INTRODUCTION	35
4.2 SOCIO DEMOGRAPHIC CHARACTERISTICS OF STUDENT RESPONDENTS.....	35
4.2.1 <i>Gender of Students</i>	35
4.2.2 <i>Classes Sampled</i>	35
4.2.3 <i>Student respondents belonging to Environmental Clubs in schools interviewed</i>	37
4.2.4 <i>Exposure to Environmental Education in any Subject</i>	38

4.2.5 Source of Information on Environmental Education.....	38
4.2.6 Education Levels of Parents	39
4.2.7 Occupation of Parents	39
4.2.8 Type of family	40
4.2.9 Size of the families of student respondents	40
4.3: STUDENTS LEVEL OF AWARENESS ON ENVIRONMENTAL ASPECTS	41
4.4 STUDENTS' PERCEPTION ON VARIOUS ENVIRONMENTAL ASPECTS.....	42
4.4.1 In Favour of Clean School Compound.....	42
4.4.2 Law to have EE taught in Schools.....	43
4.4.3 Interest in Conserving the Environment.....	43
4.3.4 Environmental Clubs for all	44
4.3.5 Trust Environmental Education to Resolve Environmental Problems.....	45
4.3.6 Trust Environmental Education to Resolve Problem in Dagoretti west sub-county.	46
4.3.7 With Dustbin in the School Compound, the Environment looks tidier	47
4.3.8 Plastic waste is a Major Problem.....	48
4.4 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF TEACHERS.....	48
4.4.1 Position in the School.....	48
4.4.2 Age of the Teachers	49
4.4.3: Teachers' Teaching Experience	49
4.4.4: Education Level of the Teachers	49
4.4.5 Type of School.....	50
4.4.6 Involved in Environmental Club.....	51
4.5 TEACHERS INVOLVEMENT IN VARIOUS ENVIRONMENTAL ASPECTS	52
4.6 TEACHERS AWARENESS LEVELS ON ENVIRONMENTAL ASPECTS.....	52
4.7 ENVIRONMENTAL ACTIVITIES CARRIED OUT IN SCHOOLS AS A RESULT OF AWARENESS	53
4.8 RELATIONSHIP BETWEEN TEACHERS' AWARENESS AND STUDENTS UNDERSTANDING OF ENVIRONMENTAL EDUCATION ACTIVITIES.....	55
4.9 ENHANCING ENVIRONMENTAL EDUCATION IN SCHOOLS	55

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS	57
5.1: INTRODUCTION	57
5.2 CONCLUSION.....	57
5.3 RECOMMENDATIONS.....	58
5.3.1 <i>Suggestions for Further Research</i>	59
REFERENCES	60
APPENDICES.....	69
APPENDIX 1: QUESTIONNAIRE FOR TEACHING STAFF	69
APPENDIX 2: QUESTIONNAIRES FOR SECONDARY SCHOOL STUDENTS.....	72

LIST OF TABLES

Table 3.1 Total population size frame of every school in Dagoretti west sub-county	31
Table 3.2 Sampling frame used to obtain cost effective sample size required for study.....	33
Table 4.1 Gender of the student respondents.....	35
Table 4.2 Distribution of student respondents according to level of study in selected schools.....	36
Table 4.3 Students positions	36
Table 4.4 Exposure to environmental education in any subject	38
Table 4.5 Student source of information on environmental education.....	38
Table 4.6 Education levels of parents	39
Table 4.7 Type of families of student respondents.....	40
Table 4.8 Student level of awareness on cultural aspects.....	41
Table 4.9 Students on favour of clean school compound.....	42
Table 4.10 Student spending time working on environmental activities.....	43
Table 4.11 Trust on environmental education to resolve environmental problems.....	46
Table 4.12 Trust on environmental education to resolve problems in Dagoretti West sub-county.....	46
Table 4.13 Dustbins makes the environment tidier	47
Table 4.14 Plastic as a major problem.....	48
Table 4.15 Position of teachers in schools.....	48
Table 4.16 Age of teachers	49
Table 4.17 Education levels of teachers	50
Table 4.18 Teachers involvement in environmental clubs	51
Table 4.19 Teachers involvement in various environmental aspects	52
Table 4.20 Environmental activities carried out in schools as a result of awareness	53
Table 4.21 Relationship between teachers' awareness and students' understanding of environmental education activities	55

LIST OF FIGURES

Figure 1. 1: Conceptual Framework	9
Figure 3. 1: Schools in Dagoretti District , Nairobi County	31
Figure 4. 1: Students belong to Environmental Clubs.....	41
Figure 4. 2: Parents' Occupation	44
Figure 4. 3: Government should pass law to have EE taught as a subject	48
Figure 4. 4: Being in Environmental Clubs.....	49
Figure 4. 5: Type of Schools.....	56
Figure 4. 6: Enhancing Environmental Education in Schools.....	62

LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA:	Analysis of Variance
CDD:	Community Development Department
DESD:	Decade of Education for Sustainable Development
EE:	Environmental Education
EMCA:	Environmental Management and Co-ordination Act
ESD:	Environment for Sustainable Development
FAO:	Food and Agriculture Organization
IIEP:	International Environmental Education Programme
KICD:	Kenya Institute of Curriculum Development
MoE:	Ministry of Education
NEAP:	National Environmental Action Plan
NEMA:	National Environment Management Authority
NGO:	Non Governmental Organization
OECD:	Organization for Economic Cooperation and Development
SPSS:	Statistical Package for Social Sciences
UNEP:	United Nations Environmental Programme
UNESCO:	United Nations Education, Scientific and Cultural Organization

DEFINITION OF TERMS

Environment: The set of physical, chemical, biological components and economic, social and cultural factors relating to a group of human beings or individual in a particular area (UNESCO-UNEP, 1985).

Environmental education activity: Any activity involving learning about environment, including actions geared towards environmental improvement

Environmental education: Refers to a process by which people acquire knowledge and develop skills and attitude in order to utilize environment in a sustainable manner.

Participation: Taking part or getting involved in a specified action

Environmental participation: Willingness to make decision to support, act to protect and conserve the environment without coercion or force (Fien, 2002)

Role: Refers to expected function in a school in this proposal.

School administrator: Refers to an officer involved in controlling and directing human behavior within a school.

Environmental degradation is the deterioration of the environment through depletion of resources such as air, water and soil; the destruction of ecosystems and the extinction of wildlife

Simple random sample is a subset of individuals (a sample) chosen from a larger set (a population). Each individual is chosen entirely by chance, such that each individual has the same probability of being chosen at any stage during the sampling process.

Environmental awareness: Consciousness of the problems and dangers facing mankind and the environment of the pressing need for positive action to control the undesirable impact of man's activities and demands upon the environment.

Sustainable development: **Development that meets the needs of the present generation without compromising the future generation from meeting their own needs (United Nations, 1987).**

ABSTRACT

Widespread environmental degradation persists, despite teaching of environmental education at various levels of education. The objectives of this study were to establish the level of awareness and participation on Environmental Education activities among teachers and learners in secondary school, to find out what Environmental Education activities exist in secondary schools and factors that hinder their delivery, to identify the relationship between teachers' awareness of environmental education and students' understanding and participation in environmental activities and to find out ways in which environmental education activities in schools can be enhanced among public secondary schools in Dagoretti West sub-county. The study targeted all the Head teachers and their Deputies, Head Students and some students within eleven Public Secondary School, in Dagoretti west sub-county. A pilot survey was carried out in two schools outside the district to gauge the applicability of the questionnaire. Data was collected using questionnaire of the selected Environmental Education related subjects. Structured questionnaires were used to solicit data from the teachers and students in the study. A total of 100 teachers and 165 students were used for the study. Data from questionnaires were coded then scored for analysis to show the particulars Environmental Education objective there in. The results were presented in texts, tabular form and analyses done by use of percentages, means and frequencies. The level of teachers' awareness was above average on Environmental aspects which included water pollution, air pollution, waste management and disposal, impact of deforestation and land pollution. Students carry out activities in schools in order to create and increase Environmental awareness include; tree planting, waste management, forest cover education, use of environmentally biodegradable materials among others are above mean of 3. Students showed a generally high level of awareness on waste management's and disposal. It also showed that teachers have been involved in various environmental aspects including teaching experience, directing towards environmental awareness, planning Environmental Education and are among the factors that hinder delivery of Environmental Education which were below average. The relationship between teachers awareness and students understanding of Environmental Education issues was positive ($r=0.202$, $p=0.044$). This implies that the students understanding increased with an increase in the teachers' awareness. Hence, need for teachers specializing with Environmental Education and Environmental Education made a subject. The study established that though Environmental Education is adequately incorporated in the Secondary School Syllabus of subjects studied, various challenges are faced by the teachers in the teaching of Environment Education theme, inadequate instructional materials, inadequate training of teachers to handle Environmental Education related topics in the subjects area and over reliance of the lecture method among others. The study recommends that there is need for improving teachers' levels of awareness of environmental aspects since this is likely to influence the levels of understanding of students, which is envisaged to change of attitude and skills in managing and taking care of the environment. As a matter of fact, Environmental Education material should be provided to schools with the aim of providing teachers and students with additional information about what ought to be done to save our environment and the planet.

CHAPTER ONE: INTRODUCTION

1.1 Preview

This chapter gives the key highlights of the research. It gives the background to the problem which cuts across the objectives of environmental education, awareness and participation. It also gives the statement of problem giving an explanation of what the researcher intended to find out. The chapter also covers the research questions, objectives and hypotheses. It justifies the study, outlines the scope and definitions of terms used and finally highlights the assumptions the researcher made and the limitations of the study.

1.2 Background of the Study

Environmental Education (EE) refers to organized efforts to teach about how natural environments function and, particularly, how human beings can manage their behavior and ecosystems in order to live sustainably (Kralj, 2010). The term is often used to imply education within the school system, from primary to post-secondary schools. UNESCO (1978) defines Environmental Education as the process of recognizing values and clarifying concepts in order to gain knowledge develop skills and attitudes necessary to understand and appreciate the environment. According to UNESCO (1978) Environmental Education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action. Environmental Education is one of the most important factors for preventing environmental problems (O'zden, 2008).

This is a cross curriculum topic promoting global awareness, sustainable living and active citizenship. It involves a structured and planned process that seeks the implementation of environmental curriculum at educational institutions at different levels (elementary school, high school, university, graduate and post-graduate levels). Cross-cutting subjects that are integrated in a global perspective but that can be learned and applied locally should implement this curriculum (Green Cross International website, 2004).

Based on these principles we might assert that EE should be multi-level and continuous. A first educational level should target special programs for non-formal adult and community-based

audiences. The second level focuses on secondary school. It involves teaching the main disciplines within an environmental context. The third level focuses on obtaining environment based professional skills within the different professional disciplines (Green Cross International website, 2004).

According to (UNESCO, 2012), Rapid globalization, urbanization, poverty, unsustainable consumption patterns and population growth were among the global trends that have resulted to environmental degradation. Global climate change, depletion of the ozone layer, desertification, deforestation, loss of the planet biological diversity, Trans-boundary movement of hazardous wastes and chemicals are all environmental problems that touch every nation and adversely affect the lives and health of their population (UNEP, 2012).

In the Stockholm Conference in Sweden 1972, participants recommended the need for environmental education. Recommendation 96 of this conference forms the foundation of Environment Education Internationally. It states that the Secretary General of the organization of the UN System especially UNESCO and other agencies concerned with environmental education such as FAO, WHO etc should offer consultation and agreement, take the necessary steps to establish an international programme in Environmental Educational, Interdisciplinary in nature, in and out of school, encompassing all level of education and directed to the general public and in particular the ordinary citizen living in the rural and urban areas, youths and adults alive with a view to educating them on the simple steps and measures they may take within their means to manage and control the environments. (UNESCO; UNEP, 1985).

This recommendation was implemented in 1975 during an Environmental Education workshop held in Belgrade Yugoslavia whose objective was to champion for the development of the IEEP. In Kenya, whereas Environmental Education has existed in Secondary since 1985, concern has been raised to the effect that students do not adequately participate in protecting and enhancing environmental quality due to lack of awareness. Student awareness about environmental problems and solutions can be increased through education. Some students with some knowledge and skills on Environmental Education are more motivated to take part in Environmental protection activities and plans thus would generate new ideas for the solution of environmental problems (Ballantyne et al., 2004).

In 1999, the parliament passed the Environmental Management and Coordination Act (EMCA). The act helped to entrench environmental concerns in the Kenya Legal Framework. The Act facilitated the establishment of the National Environment Management Authority (NEMA), an institution charged with the responsibility of co-coordinating all environmental conservation activities in Kenya. NEMA, in collaboration with other stakeholders in Environmental Education Strategy for Kenya, a developed document expected to provide guidelines on how to implement and evaluate Environmental Education to enhance sustainable development. Despite the above measures, Kenya continues to witness extensive destruction of its natural resources caused by human activities.

One of the national goals of education is to promote positive attitude towards the environmental development and conservation (KIE, 2002). The persistent environmental degradation shows that, the goal is not well achieved by the students. Policies on environmental management at school level in Kenya and world at large, may determine the extent at which environment is managed and conserved by the society and the world at large. According to UNESCO (2005), many nations around the world have embraced the need for education to build capacity to achieve sustainability, though with only limited progress having been made mainly due to lack of vision or awareness of the role that Environmental Education that should play in achieving sustainability has impeded progress and lack of policy or resources, such as funding.

There is a strong relationship between environmental policies emphasized by school administrators and teaching of Environmental Education hence the focus of instructional supervision is to provide information about their teaching so as to develop instruction skills to improve performance. Supervision is primarily concerned with improving class room practices for the benefits of students' (Beach and Reinhardt, 2000). The primary purpose of supervision is to help and support teachers as they adapt, adopt and refine the instruction practices they are trying to implement in their classroom (Wood, 1991).

In schools that follow the International General Certificate of Secondary Education (IGCSE), Environmental Education is taught as an examinable subject although its optional. The Commonwealth's National Action plan, Environmental Education for a sustainable future released in July 2000, identifies the following priorities in relation to the formal education sector; to provide quality Environmental Education materials to schools, to integrate

Environmental Education principles into mainstream curricula and to provide accessible professional development for teachers working in Environmental Education. (Department of Environment and Heritage, 2000)

According to Barret (2005), science can prove a challenging subject for many students and thus the educators often look for ways of improving the chances of students being able to grasp key environmental concepts by integrating environmental related topics in various subjects. Environmental issues offer a perfect opportunity for educators to use this kind of approach since many of the solutions to current environmental problems call on interdisciplinary resources Stapp (1969). In Kenya, several subjects in the secondary curriculum tackle environmental issues. However, environmental issues are tackled as topics and the implications of this, and of the fact that curriculum documents do not necessarily prescribe the content, is that there is flexibility in terms of the extent to which Environmental Education is covered (Stokes et al., 2001).

To highlight the importance of Environmental Education, Orodho (1996) notes that, in order to achieve the aims of a country industrialization, the anticipated beneficiaries need to have access to the appropriate kind of scientific education. Thus transition of a country from a developing to a developed country requires knowledge of Environment incorporated into Education.

The role of school administrators is demonstrated in all aspects of the general duties of the school administration, which has to do with the initiation, organization, motivation and direction of the actions of the members of a group in a specific situation towards the achievement of the objectives of group (Ojo and Olaniyan, 2008). According to Kochhap (1988), one of the school administrator's role is to improve teaching in a school by providing adequate teaching resources, organizing teachers workshops, supervising teachers and evaluating techniques in environmental education and at all levels, that would benefit learners. Effective Environmental Education programmes empower learners /students with skills to help prevent and address environmental issues and with a sense of personal and civic responsibility. Further, they are accurate and balanced, incorporating multiple perceptive and interdisciplinary aspects Pandey (2006). Thus the study aims at showing the role of school administrators in teaching environmental education in public schools in Dagoretti-west district.

1.3 Problem Statement

Widespread environmental degradation persists and human factor is the largest contributor to degradation despite teaching of Environmental Education at various levels of education. Such activities are; natural resources exploitation, changes of land use, increase in pollution and utilization of dangerous chemicals, coral mining and bombing, tourism activities and segmentation (Pandey, 2006).

Science has shown that despite the efforts of thousands of environmental organizations, our environmental problems continue to worsen where resources are being depleted and habitats are still being destroyed to make way for human progress Kralj (2010). These problems include deforestation, extinction of wildlife and destruction of ecosystem among others due to population growth. According to UNESCO (1989), population increase has led to fast environmental resource consumption. The nature and quality of the final product of a school concerning the environmental issues determines how valuable the policy making, management and supervision have been (Cheal, 1962). Teachers' competency in subject matter as well as their role as administrators has positive impact on individual student performance (Onsonu et al., 2006).

Most reports indicate that EE teaching is based on in and about the environment, whilst very few are reported to be based on for the environment Bolstad et al., (2004); Brown, 2003; McLean, 2003), students are seldom involved in decision-making Barker and Rogers, (2004); Bolstad et al., (2004), and little is done to empower the students to address the issues and resolve the problems Hart, (2003); Palmer, (1998). In some locations of the world EE is not mandated, it is for schools/teachers to decide what and how to teach thus affecting the quality of teaching and understanding of EE (Bolstad et al., 2004; Eames and Cowie, 2004). To increase the people's awareness of the importance environmental protection and to enable them participate in the efforts of Environmental conservation, government must implement environmental education and awareness programme (Pandey, 2006). Non-formal Environmental Education is more capable of the responding to local environmental issues which have more social meaning and usefulness to the community and is less dominated by academic requirement.

According to Kenya Institute of Curriculum Development (KICD) 2002 Syllabus, one of the national goals of education is to promote positive attitude towards environmental developments

and conservation. In the International General Certificate of Secondary Education (IGCSE) syllabus, one aim of Environmental Education is to enable students acquire willingness to review their own attitudes in the lights of new knowledge and experiences.

In spite of environmental issues being integrated or inferred in the subjects curricular and co-curricular activities in the Education System in Kenya, there are still environmental management deficiencies and malpractices in and out of schools.

In Kenya, the factors influencing awareness and participation in environmental education activities in secondary schools largely remain unknown. Thus, the study aimed at identifying the factors influencing awareness and participation in environmental education activities in secondary schools, the competency levels of teachers and students on environmental education and how environmental education can be enhanced in secondary schools in Dagoretti-west district, Kenya. The current study will benefit the school administrators, teachers, students and the Kenya Institute of Curriculum Development by emphasizing the need of incorporating Environmental Education into the school curriculum as a compulsory subject on its own. This will increase the levels of awareness and improve participation on environmental activities (Murford, 2003)

1.4 Justification of the Study

The study will assist the school administrators, curriculum developers and the students in linking the knowledge provided by subjects that teach Environmental Education. The study documents that; for school administrators to ensure effective environmental education, they must integrate: Education in the environment which explains that; experiences beyond the classroom in both natural and built environment not only provide opportunities for students to gain firsthand experience in the environment, but also enhance classroom-based work. These opportunities can be used to develop skills in observation, data collection, practical inquiry and investigation, the use of specialist technology. Such situations can also require social and cooperative skills, group work skills, communication skills and problem-solving skills (OECD, 2001).

Policy makers, the Ministry of Education, National Environment Managements Authority (NEMA) and Curriculum developers at the Kenya Institute of Curriculum Development (KICD) may also benefit from the study because the information may help them see the need to incorporate Environmental Education into the school curriculum as a subject on his own.

Education about the environment which involves knowing about and understanding the natural and built environment, and appreciating the key social, political, ecological and economic factors that influence decision making on local, national and global issues if students are to meet the aims of Environmental Education. Education for the environment, which is intrinsically linked to the “affective” aspects of environmental education, deals with people’s emotions and their willingness to make lifestyle choices that maintain and improve the quality of the environment (Osaki, 1995). The study is envisaged to increase knowledge and awareness among students about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action to a better environmental management and conservation.

1.5 Research Questions

Responses to the following questions aided in adducing data for the research.

1. What are the levels of awareness on Environmental issues among teachers and learners in secondary schools in Dagoretti west district?
2. What are Environmental Education activities existing in secondary schools and factors hindering their delivery?
3. Is there a relationship between teachers’ awareness of Environmental Education and students’ understanding and participation in environmental activities?
4. How can the Environmental Education activities in schools be enhanced?

1.6 Main objective

The main objective of this study was to identify the roles of school administrators, the level of understanding among teachers and students on EE and the influence of socio-economic aspects on the understanding of Environmental Education

1.6.1 Specific Objectives

The specific objectives that guided the study were;

1. To determine the level of awareness on Environmental issues among teachers and learners in secondary schools.
2. To find out what Environmental Education activities exist in secondary schools and factors that hinder their delivery.

3. To identify the relationship between teachers' awareness of Environmental Education and students' understanding and participation in environmental activities.
4. To find out ways in which Environmental Education activities in schools can be enhanced.

1.7 Hypotheses

The hypotheses of this study were that:

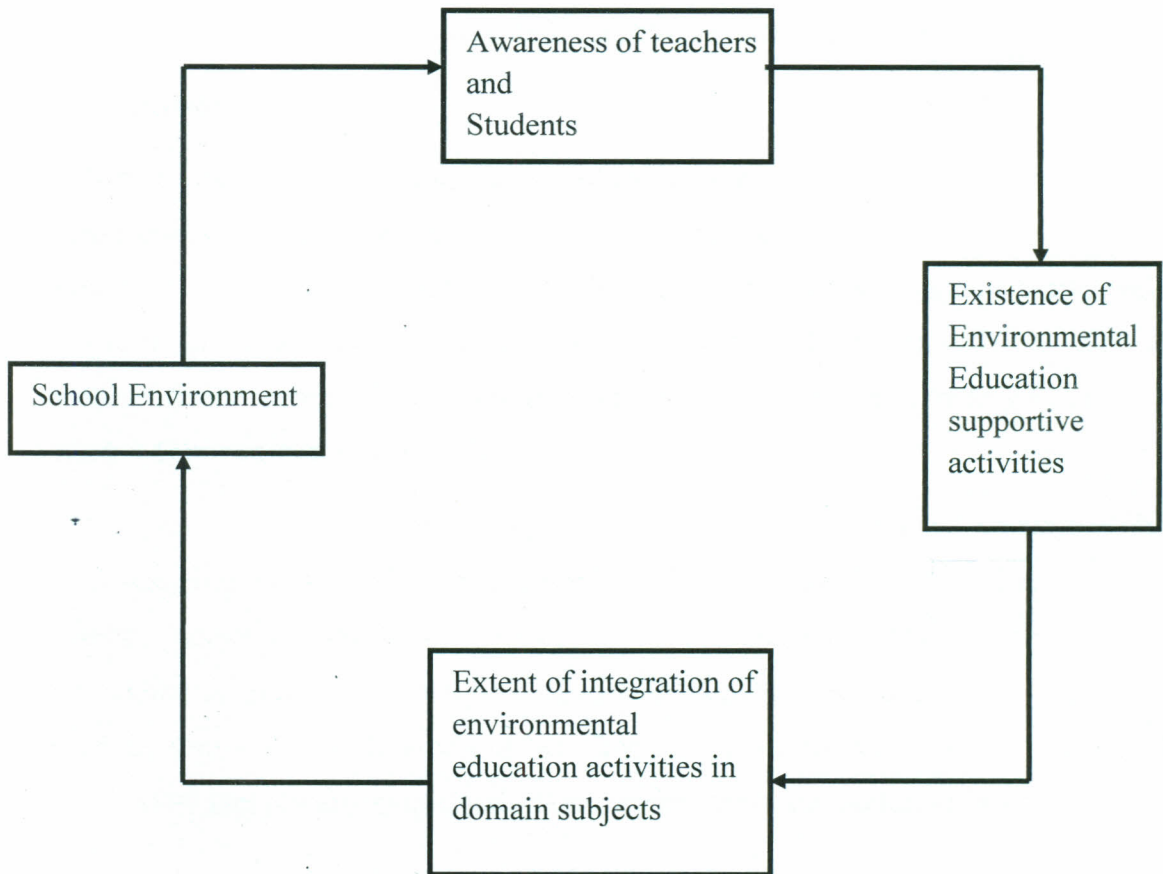
1. Most teachers and students are not aware of the Environmental Education activities in their schools.
2. Multiple factors hinder delivery of environmental activities such as tree planting in secondary schools.
3. There is a strong relationship between teachers' awareness of Environmental Education and students' understanding and participation of environmental activities.
4. Training of both teachers and students enhances their awareness of Environmental issues.

1.8 Conceptual Framework

A conceptual framework is used in research to outline possible causes of action or to present a preferred approach to an idea or thought. They can act like maps that give coherence to empirical inquiry Botha, (1989). The concept informing this study was that Environmental activities such as tree planting, cleaning the school compounds, garbage collection and erosion control mechanisms are carried out in the school environment.

The school environment is composed of social sphere (teachers, students and workers), Bio-physical sphere (buildings, flora and fauna) and economic sphere (economic generating activities) which influences the environmental activities carried in different schools.

The environmental activities influence both the teachers and students not only to generate various solutions to the environmental problems, but to become aware of the conditions which lead to the current state of environmental affairs, and to improve their abilities to make decisions. (Figure 1.1)



Key: The direction of the arrows indicates how factors influence environmental awareness

Figure 1.1: The influence of school environmental influence environmental awareness and participation in environmental activities.

1.9 Limitation

The research may have the following limitation. Only a specified percentage of the students' and teachers' population was used to represent the whole population and therefore most students were locked out and did not participate in the research. Time and finance may be additional constraints.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter gives review of literature related to the study. It puts into perspective factors that influence awareness and participation in environmental education activities in secondary education. It is under this section that the objectives of environmental awareness and participation in environmental activities are reviewed in depth. The chapter also gives a perspective of environmental education in secondary schools which is the target of the study.

2.2 Global Environmental Education

Over the past few decades, the world resources (environment) have undergone dramatic changes resulting from accelerated economic and social transformation. Large increases in population, industrial production, advances in science and technology have transformed the earth's natural resource base, as source of material inputs associated with economic activity. Further, as stated in the Sourcebook in Environmental Education for Secondary School Teachers, 1990 that poverty causes pollution □ at the same time pollution causes poverty.

The landmark report of the World Commission on Environment and Development warned that unless we change many of our lifestyle patterns, the world would face unacceptable levels of environmental damage and human suffering (Conference on Hunger and Poverty, 2007). It further emphasized that poverty is one of the primary source of environmental problem particularly from undeveloped and developing countries. Poverty and population growth are related. As the population increases, poverty line increases to the point that migration to rich and diverse natural resources are what usually happened and practiced by the community in Thailand. In places where people usually flock for living, the environmental quality is quite low due to massive and intensive utilization (Taengthientam, 2000).

However, in most cases, economic production systems tend to ignore the environmental impacts because they considered natural resources as free supplies and don't need the cost to maintain its quality. Exclusion of environmental cost makes the product cheaper, thereby increasing the market demand and therefore, resource depletion is increasing faster without restoration (O'Hearn, 1975).

These situations simply emphasized the urgent need for change in the pattern of global economic growth to planet's carrying capacity. We need to maintain the equilibrium state between the economic growth and environmental preservation to get the environmental quality required to sustain long-term economic development. Thus, the situation of the country brought some public attention for immediate need to promote awareness and social responsibility to improve Thailand's environmental condition.

Since the situation not only happened in Thailand, but all over the world especially in developing countries, on 1992 the United Nations organized a conference in Brazil called Earth Summit with the main themes on environment and development. This meeting called the attention of the participants on how to make change future development of the world that is economically, socially and environmentally sound and sustainable. During this summit, that the Agenda 21 Sustainable Development focused was created (Keating, 1993). In respond to the meeting, Thailand promulgated a law B.E 2535 Enhancement and Conservation of National Environmental Quality Act that promotes transparency and accountability in reversing the surge of environmental destruction of the country (Laird, 2000).

In addition, the 7th National Plan for Socio and Economic Development emphasized the equal importance of environmental conservation and economic growth and it brought a great impact to environmental protection, which answer the 4th National Plan on sustainable economic growth of the country (Tabucanon, 1998) and the 8th National Plan focused on the promotion of effective management to balance the resource utilization and protection programs (Country Paper, MOI). However, due to rapid growth of the population and communities, it was impossible to depend on the government's efforts alone. Government and non-governmental organizations launched projects to enforce and stimulate environmental awareness through education or legislations. Environmental NGOs were becoming more active and some business leaders have taken up the challenge to adopt environmentally friendly techniques in production processes and to promote the adoption of environmental standards in industry and commerce.

Environmental consciousness has rising in the country of Thailand, but not yet to the critical level that community action that could reverse pervasive environmental degradation because majority of the people are not environmentally literate and aware: Only few knew and understand the situation. There was lack of basic knowledge about key environmental issues.

Our citizens rely on outdated, incorrect information and common myths when making environmental decisions (Main Street America's View of the Environment in the 1990's, 1998). Besides, some environmental programs could not work efficiently due to lack of work plan, lack of coordination and many others. Thus, environmental education was developed to strengthen and enhance public awareness and participation.

It is a procedure in education, training and information dissemination about environmental factors and its surrounding problems and possible solutions (B.E 2540-2544). The 1992 Decree on Administration of the Community Development Department (CDD) emphasized the function of the department to educate people to become self-reliant economically and socially without harming the environment. It was further stressed by O'Hearn of 1975 the crucial need for realizing trade-off decisions between environmental and economic consideration will be emphasized in public education to achieve full environmental protection. He stressed that people should know that a better environmental quality is costly to cover the damages from production consumption pattern. That corrective action will cost for every undesirable environmental situations exist.

Non-formal environmental education was extended even to out of school and underprivileged populations, giving equal opportunities to study, improve their living conditions and somewhat change their attitudes toward the environment (Vichitra Samanasena) and the National Science Center for Education, a division under the Non-Formal Department of the Thailand Ministry of Education played a role in non-formal education curriculum to promote environmental awareness through various interactive education activities and programs and provide updated information on scientific matters (Srisuparee Jantrasilpin). However, these are not enough to accommodate the need of all individuals. There is a right agency believes to be effective in implementation of environmental education.

2.2.1 Environmental Education in Norway

Norway is a country that is trying to use a systemic approach to implement a national environmental education system. Even though many elements of the Norwegian experience can be applied elsewhere, it must be understood that these types of initiatives have to be locally adapted to the particular needs and circumstances of each country. In this case four areas of

system change were identified: commitment, curriculum, competence and cooperation (Benedict, 1999)

In "A Systemic Approach to Environmental Education," Benedict (1999) points out; "The goal of the Ministry of Education's strategy was that all pupils should receive environmental education in line with the UNESCO goals, including knowledge, attitudes, capabilities and behaviour. A rather large group of teachers, researchers and organizations was involved in developing the strategy, which went through several stages of revision and is still being periodically revised. Thus, the Ministry of Education itself has taken a leading role in initiating change. Staffing (one full-time position) and a substantial budget was allocated to this work, which was led by the Ministry of Education."

The goals of the Norwegian strategy were oriented toward the system as a whole, not individual schools or programs which included Clarify the goals and contents of environmental education, Contribute to organizational development in schools, Ensure that the strategy is implemented, Clarify and coordinate efforts in environmental education between the school system and its cooperative partners and Evaluation. These goals touch on commitment and responsibility, and on the part of the Ministry of Education, competence and cooperation. *Curriculum* was being dealt with in a general curriculum reform so it did not appear in the strategy goals (Benedict, 1999).

2.2.2 Environmental Education in Malta

Malta has a typically a highly centralized education system where teachers are very rarely, if ever, consulted about curricula. As Pace noted (1997), elementary school curricula are essentially fragmented and mono-disciplinary, making interdisciplinary learning hard to apply. Even though environmental topics have become much more relevant in recent years in secondary schools, it is also fragmentary (Pace *et al.*, 1997). While environmental education is not a national Maltese priority, at least there is a growing awareness phase by government and other organizations where the need to incorporate environmental topics into their educational system is being recognized. Different organizations have included environmental education in their agendas. However, they have been forced to work in an uncoordinated way due mainly to a lack of official support and organization (Pace, 1997).

As Pace (1997) declares, “In an attempt to improve the situation the Education Division, the Environment Secretariat, the faculty of education and some NGOs jointly organized the Second National Training Workshop on Environmental Education in Malta (May 1995). The goal of the event was that of getting all those involved in environmental education together to; become aware of the state of environmental education in the region, identify the problems, needs and support required for the successful implementation of environmental education initiatives and, to discuss the possibility of coordinating these initiatives so as to improve their effectiveness”.

While Malta has a long way to go before a national environmental education strategy can be fully implemented in their educational system, the country has at least recognized the intention of incorporating environmental education into their education system and some efforts in this direction are being produced.

2.2.3. Environmental Education in Children

Childhood is perhaps the age that fathers the most important memories in a person’s life. Most adults retain and unconsciously use information commencing from upbringing experiences. It is during this early stage where personality begins to take form. Almost everything that children learn is provided in different ways by the outside world. The natural environment is a significant component in this learning process (Sobel, 1995).

Children are very emotional and sensitive about everything they learn. They can easily be attracted or repelled by any topic. Environmental education must not be presented to them with a sense of doom or disaster so they don’t avoid or dislike it. If they feel the natural world is a universe of problems they might not want to deal with it at all. Children should be given a chance to bond with the natural world before they are asked to heal it (Sobel, 1995).

Kids learn better when they focus first on local issues and globalize after. As noted in Sobel’s report (1995), local environments should be the basis for curricula with six through nine year olds. Only after they are able to think in an analytical manner can they learn in a global way (Sobel, 1995).

EE and community conservation needs should be viewed in a continuous and progressive perspective. A study conducted during a 4-week period in the town of Quebrada Ganado, Costa Rica by Vaughan et al. (2003), revealed that if EE programs for children are guided in a proper way, parents and other adults could also benefit from them. Knowledge gain passed on from children to parents (and other adults) indicates that awareness can be delivered in a consecutive way from the classroom to the community (Vaughan, 2003).

2.2.4 Environmental Awareness and the Public

Environmental awareness relates to the recognition by the public of environmental issues and values, and the implications they have in relation to economic issues and social standards of living (Chaineux, 1999). It is best produced and developed by personal exploration and discovery of people's surroundings (Wood, 1994). Public environmental awareness and participation is vital to the goal of achieving a sustainable future. Social involvement in this course of action can only happen when the communities are aware of the importance of maintaining healthy and productive ecosystems (De Lorme, 2003).

Environmental public awareness is shaped by economic, social, professional, religious, ethnic, cultural and educational factors. Civic context must be well understood before an awareness campaign is planned. The most appropriate way to deliver context-aware information will often depend on the activities and type of social interaction the target groups experience (Madduma, 1989). Public environmental education and applied communications are the key tools for expansion and effective delivery of awareness campaigns to different types of audiences. Campaigns and programs should be designed in a sustainable way to assist target groups with the acquisition of knowledge, skills, and attitudes that are necessary to solve actual and local environmental problems (Allen, 2001). Outside and intersectional cooperation may be necessary to initiate them.

Partnership efforts between different institutions, like government and nongovernmental organizations, private businesses or educational entities, are means that can produce positive results in communicating environmental topics (Smyth, 1995). Effective communication among scientists, academic institutions and different type of organizations is critical to this

process, but the main purpose is that the general public somehow embraces the application of sustainable and ecologically sound policies (Allen, 2001).

2.2.5 Effective Use of Media Outlets

The media's role in environmental education is important because it is through newspapers, magazines, radio, and television that people gain awareness. Awareness is simply a step in EE. Modern communications have provided information for the growing public demand of related information; we now see more environmental magazines, newsletters, and journals, along with TV and radio programs (Filho, 1995). Recently, public radio and television broadcasting considers all of its programming to be educational by including topics like science and nature, drama, music and dance, in addition to varied civic issues. It has a vast delivery span given the fact it can reach audiences in homes, schools and public places (Monk, 1991).

Communicating environmental information is very challenging due to the dynamic and complexity of natural systems. The ways in which science has conventionally related with society must be reassessed and adapted to get in touch with current environmental and social realities. The scientific community must focus on learning to communicate more effectively (Allen, 2001) with policy officials and educators. With proper conduction, media can offer us good communication tools that can be used as educational aids to reduce the gap between scientific knowledge and civic awareness.

Scientific groups, journalists and non-governmental organizations play a major role in environmental public education processes. Scientists are among the first to come across evidence of detrimental environmental impacts resulting from human-related activities. However, due mainly to cultural clashes, these groups frequently experiences difficulties in knowing how to efficiently communicate their discoveries between themselves and the general public. It has been recognized that with the help of well-informed communication professionals, proper information exchange among scientists, communities and non-governmental organizations, significantly increases public awareness of environmental issues. This occurs best when well-designed and cooperative communication strategies are put in place (Allen, 2001).

As Allen (2001) says; “Scientists and journalists have had plenty of positive interactions. Yet despite the idealistic motivations of scientists and professional journalists, chaos and hard feelings sometimes characterize the interactions between them. Such discord is largely the result of a clash of two cultures, science and the newsroom. Framed simply, science is the world of labs, publications, peer review, and acceptance according to the values and norms of science. Journalism's task is to inform the public speedily, to detail history on the run.”

Leal Filho (1995) declares; “to ensure didactic potential of the media for environmental information and for environmental education is fully used, there are a number of items, which need to be considered. Some of these are diversity of information: newspaper articles, as well as television and radio programs may be used as resource materials for classroom-based lessons provided that due guidance are given and that the issues discussed may be closely related to curricular themes. Time relevance: the use of printed or broadcast materials ought to provide a supply of recent information with up-to-date details.

2.3 Environmental Awareness

Environmental Education involves the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his bio physical surrounding (UNEP, 2012). It is in this light that students understanding and level of awareness on various environmental concepts and problems is important. Environmental awareness is defined as the sum total of responses that people make to various thematic aspects of the construct environmental education. In simple terms it means knowledge and understanding of facts and concepts related to environment and consequences of various environmental problems like pollution, population explosion, deforestation, ecological disruption, energy crises etc. Environment has become the concern of all academicians, intellectuals, scientists, policy makers and government across the continents. Widespread and systematic concern for environmental issues has grown world over.

The U.N. World conference on the environment in Stockholm in 1972, the Earth Summit held in Rio de Janeiro in 1992, the Global Forum 1992 and the activities organized by the international NGO forum, show that environment is in the agenda of International Community

(Toili, 2007). Following this detrimental effects resulting from environmental degradation, it has become more important to find a preventive way slow down the effects and eventually sustainably mitigating long-term environmental damage. One of the best ways of preservation is by creating environmental awareness among society especially students as they are future leaders, future custodians, planners, policy makers, and educators of the environment and its issues (Jackson, 2005). Awareness of environmental issues has grown tremendously over the last decade as modern science and a more globally conscious population continues to enlighten to the connection between a healthy planet and livelihoods of people everywhere.

2.3.1 Public Environmental Awareness and Education

Action can be taken in a variety of areas to increase environmental awareness and education. Some of these categories are: environmental legal rights and responsibilities and associated consequences, use of the media, awareness raising campaigns, incorporation of environmental issues in mainstream education, increasing awareness and education in target groups and encouragement of public participation in environmental matters. As the following case studies illustrate, many sectors of society are involved in developing and delivering educational courses and public awareness campaigns. These include Governmental institutions at the national, regional, and local levels; domestic and international NGOs; primary, secondary, and post-secondary schools; journalists and the media; celebrities; and other individuals and institutions (UNEP, 2007).

Moreover, educational and awareness efforts can target practically any sector of society. They can seek to raise public awareness broadly on environmental issues (e.g., through the media) or they may be a targeted campaign or educational effort focused on a specific sector (or target audience) on a specific issue. Funding for awareness and education initiatives may come from a variety of sources. Often, it comes from the budgets of specific agencies or Ministries; it is uncommon for such initiatives to receive funding directly from the central budget. Some States have accessed their national Environment Funds to provide partial funding for environmental awareness and education. Environmental education and awareness raising can include any of the following types of activities: reorienting current education and awareness programs to include environmental dimensions, basic education and awareness programmes

(e.g. in schools), adult and community education and awareness programmes; and education, training, and awareness programmes for professional, technical, and vocational personnel.

Accordingly, in addition to the case studies, explanatory text, and other reference materials following this Guideline, other relevant material may be found following Guidelines 30, 31, 34(a) (especially the case study on “NGOs Providing News Relating to MEA Implementation”), 41(a) (iv), and 41(m). Guideline 43, on training, may also be consulted (UNEP, 2007).

For decades, that connection has arguably been undermined by population growth, urbanization and land area loss, creating a potential divide between people and the natural environment. Through contact with and learning about natural areas we can begin to mend this disconnection and restore our balance with nature. Environmental education (EE) has the potential to facilitate awareness that leads to this connection. Exposure to nature, either through structured EE programs or unstructured play, has many benefits (Woodgate, 2012). Environmental awareness is the ultimate driving force that stimulates knowledge on environmental matters. The acknowledgement that an environmental problem exists entails being more cognizant of the facts about the state of the environment. The power behind the awareness can be categorized into three i.e. basic beliefs of an environmental problem, factual and scientific knowledge, and a commitment to solve environmental problems (Hansmann, 2009).

Shobeiri (2005) states that, solving existing environmental crisis requires environmental awareness and its proper understanding which should be deeply rooted in the education system at all levels of school education. The existing curricula at primary, secondary and college levels provide a lot of opportunities to make the students aware of environment. Awareness will make students more knowledgeable on environmental matters thus a possibility of shaping their attitudes and behaviors. Responsible environmental behavior is the ultimate goal of environmental education which is a key foundation to sustainable development (Yurtt and Sullun, 2010).

2.4 Environmental Education in Kenya

Kenya’s wealth is endowed in its natural resources that are distributed throughout the nation. It is among the 47 countries within sub-Saharan Africa that depend heavily on their natural resources for economic and social needs. Two-thirds of the country’s population live in rural

areas and rely on agriculture and other natural resources. However, the natural resource base is shrinking rapidly, environmental problems are becoming increasingly severe, pushing the country into poverty and associated environmental problems such as deforestation, soil erosion, pollution and health. This indicates that these resources cannot be guaranteed for future generations in the same quantities and quality. It is unsustainable. Despite the various initiative and responses that have been practiced and recommended, there have not been any remarkable results.

As a response to the above challenges, Environmental Education (EE) is one of the efforts the Kenyan government adopted following the 1977 Tbilisi Conference, and the 1987 Moscow Conference. The Kenyan government is committed to Agenda 21, Chapter 36 on Education and Sustainable Development, and demonstrated by this by the adoption of the National Environment Action Plan (NEAP). Poverty is still a major challenge facing the country. It is estimated that 75 per cent of the nation's population is living below the poverty line. The poor socio-economic status of the people has far-reaching consequences for the country's efforts to conserve its natural resource base. Formal and non-formal ESD along with civic education is fundamental in developing respect for nature and an understanding of cultural values. To coordinate this and ensure effective implementation, a national framework (strategy) is important to affirm that Kenya places ESD at the center of the national agenda, prepares action plans and allocates adequate resources for the programmes.

In a further pursuit to attain the goals of SD, the nation identifies *capacity building* as a viable response within the interplay of political, economic, social and technological hurdles. ESD for all levels is a strategic approach to meeting this requirement. This, therefore, has called for a shift from EE to ESD indicating a change of focus from concern primarily for nature and the non-human environment, to an approach emphasizing the interdependence of human welfare and a healthy environment. SD will therefore be the main goal of the whole education system, both formal and non-formal, from preschool to higher education and adult education. Kenya seizes the opportunity to use the UNESCO-UNEP Decade of Education for Sustainable (DESD), 2005-2014 to set the pace towards improved delivery of ESD.

The National Environmental Management Authority (NEMA) has recognised the need to develop a national framework: *ESD: Strategy for Kenya 2005-2010*, to mainstream ESD in Kenya's education system. The strategy focuses on key domains of ESD namely Basic Education, Reorienting Existing Education Programs, developing Public Awareness and understanding of Sustainability and Training in achieving SD. The strategy also focuses on pertinent issues that need to be addressed in order to achieve SD in Kenya. These include overcoming poverty, achieving gender equality, health promotion, environmental conservation and protection, rural transformation, sustainable production and consumption, intercultural understanding, peace and disaster preparedness.

2.5 Environmental Awareness among the Teachers and Students

It has been agreed by many philosophers that education and awareness towards environmental protection and conservation require knowledge, understanding, and the change of attitude by each individual (Hassan et al., 2009). The need for Environmental Education was recognized by the united nations community at the United Nations Conference on the human environment Stockholm, (June, 1972) which recommended that Environmental Education be integrated into the whole system of the formal Education at all levels to provide the necessary knowledge, understanding, values and skills needed by the general public and many occupational groups for their participation in devising solutions to Environmental problems. Kenya has since then made great effort in creating awareness amongst her people about the need for protecting Environment. The role of adolescent and adult in taking care of the environment is different based on their development of age. This philosophy presumes that knowledge can be acquired from the relation between human and nature, as both elements are interconnected (Hassan et al., 2009).

Environmental Education is seen as the way of developing awareness of the environment and a sense of responsibility for its protection. It is hence the most effective vehicle for persuading the human race adopt a national attitude towards the national environment and to avoid the deterioration of the human race as result of unwise exploitation and misuse of nature (Otiende, 1991) Environmental Education is a process of recognizing values and clarifying concepts in order to develop skills and added tools necessary to understand and appreciate the inter-

relationship among men, his culture and his Bio-Physical surrounding. Exposure to nature either through structured Environmental Education programs or unstructured play has many benefits (Woodgate, 2012).

Environmental awareness is the ultimate driving force that stimulates knowledge on environmental matters. The power behind the awareness can be categorized into three that is basic beliefs of an environmental problem, factual and scientific knowledge and a commitment to solve environmental problems (Hasmann, 2009). Awareness will make students more knowledgeable on environmental matters thus a possibility of shaping their attitude and behaviours.

The aspects of experience and students are the social organisms that are constantly interacting with the surrounding, and change based on time and condition and thus, the implementation and appreciation towards moral and value which involve the students within the activity and environment are more significant than the learning activity solely based on theory Hassan et al., (2009). By involving the students with the activities regarding the cleanliness of the school, students are implemented with the attitude to love and concern towards their school and the surrounding. The knowledge that have been gained by these students is very useful within their life, as the function of knowledge towards the students is the beginning of intelligence and becomes the last objective of education The high environmental awareness created among students gives them an opportunity to learn on how to nurture this nature and avoid themselves from over exploiting the resources and thus this prepares the students to become responsible individual that are able to contribute towards the harmonious society and nation Hassan et al., (2009)

As the schools and the teachers are becoming the societal agents towards well being of students, the educators/teachers should present the good attitude in shaping element of environmental awareness among the students since they become the role models to the students Hassan et al., (2009). The appearance and the manifestation of the teachers are very important in realizing the objective of school management to implement the element of environmental awareness Min of Education, (1987).

2.6 Participation in Environmental Activities

One of the aims of EE is to provide learners with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment. EE is

therefore meant to create opportunities and capacity for learners to actively engage in addressing environmental challenges. This will involve taking individual as well as corporate responsibility (Erol and Gezer, 2006). Participation is the point of action towards environmental protection. It is the final stage in EE conceptual framework depicting and informed citizenry with capacity to make informed decisions and take action. Effective participation process should be creative and flexible drawing on the wide array of approaches and methods. It should therefore encourage a creative and original approach in the use of participation techniques (Sarkar, 2011).

Participation is a kind of dynamic activity that enables and encourages people to better play their function in developmental undertakings. In this process, any individual benefits from the right of participating in decision making related to his way of life. The arising question is to find out the factors influencing individuals' participation in environmental activities. Goulding (1990) found that, factors of information, education, organization, as well as mutual understanding between individuals and organizations as effective factors in public participation, particularly in environmental activities. Besides this, research has also shown that individual characteristics, such as: sex, maturity, idea development, one's familiarity with participation, being alert of the prevailing problems, information concerning the precedent pertinent activities are some other important factors of participation (Akabayashi, 2003). The United Nations Conference on Environment and Development held in Rio de Janeiro in 1992 reiterated, in Agenda 21, that through EE school children are obliged to participate actively in guarding the quality of the environment. This is because they comprise half of the world population and are highly vulnerable to the effects of environmental degradation now and in the future (United Nations, 1994).

2.7 Environmental Education Activities/Projects that exist in Secondary Schools and Factors that hinder their Delivery

Environmental Education has gained prominence in school system in co-curricular activities such as wildlife clubs of Kenya, Environmental clubs, K.I.E, (1997). In the International General Certificate of Secondary Education (IGCSE), Environmental Education is taught under the subject Environmental Management. Its syllabus can be seen as positive Education response to the report of the world commission on environment and development.

One of the aims of Environmental Education is to provide learners with the opportunity to acquire the knowledge values, attitude, commitment and skills needed to protect and improve the environment. This will involve taking individual as well as responsibility (Erol and Gezer, 2006). Participation is the point of action towards Environmental protection. It should therefore encourage a creative and original approach in the use of participation techniques (Sarkar, 2011).

Prior studies indicate that projects have a significant role in Environmental Education. Projects help students not only to generate various solutions to the environmental issues, but to become aware of the conditions which lead to the current state of environmental affairs, and to improve their abilities to make decisions Pruneau et al.,(2006); Xue et al., (2006) Banks et al., (2005); Jones and Merrit, (1999); Megalos, (1996). Out of school youth programmes, have been established and are too concerned about the environment. For example, the young farmers club, wildlife club among others. The aim of the clubs is to develop interest and creativity in farming, conserving the natural resources and help them adjust more easily their new environment when they leave school. Lack of adequate instructional materials is an important factor in limiting Environmental Education Pettus and Schwaab, (1979). Environmental Education projects can effectively address the gap between complex environmental problems in the real world and disciplinary curricula education Hungerford et al.,(1980). Teachers often conduct environmental activities in their own fields after being influenced by projects in schools (Graber and Robottom, 1999).

In such situations, schools can become the Centre of their neighborhood, be it at a local, national, and even international level, and their interaction with their environment is enhanced. There are numerous studies regarding environmental education projects. Eames et al., (2008) examined a national project containing environmental education applications. The United Nations General Assembly initiated world environment day in 1972. Each year around the world, activities are organized that spend environmental awareness such as clean-up campaigns, tree planting and recycling education. This allows secondary school students to take part in the Environmental awareness activities and their own schools. At the end of the study, it was found that the participants' environment awareness and respect for nature increased and as they did students' knowledge, value and attitudes towards the environment also developed.

Kaya and Gokce, (2010) notes that some of the co-scholastic activities including organization of plays, cultural programs, debates, mock parliament, discussions and community activities may help further in achieving the objective. Others include field work such as tree planting, cleaning the compound, garbage collection and soil erosion control. Some of the studies have identified the challenges facing effective implementation of the projects. Graber and Robottom, (1999) noted that among the problems arising from students, were not being able to participate in projects due to crowded classes, competing assignments, heavy workload due to exams, and time constraints. Shah and Treby, (2006) emphasized that students' need sufficient time, financial support and appropriate conditions in conducting project work. The committee of students who reside far away from the schools also negatively affects participation Kaya and Gokce, (2010).

Fien, et al, (2001) found out that one of the problems faced in environmental projects is lack of time also pointed out in their study was that some teachers' knowledge and skills are insufficient for the projects whereby they give environmental punishments that de-motivates the students about taking care of the environment. Fien et al. (2001) also found that one of the problems faced in environmental projects was economical deficiency. Battersby, (1999) also pointed out that economical resources are essential for environmental education. Among the problems faced in projects, the main concern related to the parents is the lack of communication between teachers and parents.

There is need for social support for and engaging parents in projects. Practical activities especially laboratory experiment, field work and excursions are of high importance but are often neglected Bojana, (1994). He explains further that, practical experience related to natural phenomena and technological processes is necessary for a competence decision making and problem solving ability especially in use of natural resources and materials and conservation of habitat and wildlife. Because of this weakness many opportunities of strengthening practical science education in a cost effective and highly motivating fashion may be missed. This study therefore endeavors in finding out what environmental education activities/projects exist in secondary schools and factors that hinder their delivery.

2.8 Relationship between Teachers' Awareness of Environmental Education and Students' Understanding of Environmental Aspects

Since the Tbilisi declaration in 1978, education has been accepted as the basic tool to control the environment and sustainable development. Tbilisi declaration has defined Environmental Education as the process of learning that can enhance knowledge and public awareness related to the environment and the associated challenges, developing expertise and skills necessary to tackle challenges, develop attitude, motivation and commitment in making environmentally responsible action (Tunku, 2006). Schools became of the main ways to tackle and environmentally (Morøye, 2005). Environmental Education help future generations to control their lives and have a prosperous future by (Perikleous, 2004). One way to implement Environmental Education is to integrate Environmental Education within other subjects in the process of teaching and learning in the classroom (Perikleous, 2004).

According to (Asikhia, 2010) teachers believe that students' poor academic performance is not influenced by teachers' qualification while students perceived that teacher's qualification do affect their academic performance. The difference in their perceptions could be because students have high expectations for teachers that should teach them and therefore believe that any teacher that does not meet up to such expectations will not aid their academic performance. However, Jones and Merritt, (1999) pointed that students' poor academic performance is influenced by teachers' qualification.

Studies by Aini et al; (2007), found that among the problems identified in the implementation of Environmental Education in schools in Malaysia are that not all teachers use the handbook which was prepared to teach Environmental Education, the handbook provided was not able to help teachers to fully implement the activities in Environmental Education, the time constraints in completing the school syllabus and problems in financial allocations.

In this case, although the environmental issues that need to be taught are listed according to subject and under the guideline of ministry of education, the quality implementation is highly dependent on the awareness, commitment and instructional leadership of principal (Hotinli, 2004).

Also, only teachers perceive that teachers' method of teaching and learning material influence students' academic performance (Asikhia, 2010). This is supported by Ajayi, (1988) who suggested that the fallen level of academic achievement attributes to teachers' non-use of verbal reinforcement strategy. Students' disagreement to this may be because they perceive that students' personal factors affect their academic performance and level of awareness more than teachers' method of teaching and learning environment. The role of secondary education is to lay the foundation for further education and if a good foundation is laid at this level, there are likely to be no problem at subsequent levels. However, different people at different times have passed the blame of poor performance in secondary school to students because of their low retention, parental factors, association with wrong peers, low achievement, low retention, low achievement motivation and the likes Aremu, (2003); Aremu, (2001); Aremu, (2000).

Poor academic performance according to Aremu, (2003) is a performance that is adjudged by the examinee/testee and some other significant as falling below an expected standard. Morakinyo, (2003) believe that the falling level of academic achievement is attributable to teacher's non-use of verbal reinforcement strategy. Others found out that the attitude of some teachers to their job is reflected in their poor attendance to lessons, lateness to school, unsavory comments about student's performance that could damage their ego, poor method of teaching and the likes affect pupils' academic performance.

2.9 Enhancing Environmental Education Activities in Secondary Schools

Kaya and Gokce, (2010) in their study recommends that project activities should be carefully and strategically planned where all stakeholders of the project (students, teachers, school administration, parents, sponsors among others.) are well trained and given an opportunity to work collaboratively. They noted that stakeholders have different needs and motivational approaches should be developed to address each group. According to Engleson and Yorkers, (1994) educational methods and techniques, equipment and communication technologies should be used. The inclusion of some activities like competition, reward that will make projects more attractive to the students is needed. Support should be given to projects (financial support, scientific counseling, permission etc.) Participation in projects should be on voluntary basis. There should be cooperation with various institutions (municipality, civil society organizations etc.). There should be coordinator teachers whose focus is on project work at

schools; project experiences should be shared among schools and sustainability issues should be discussed.

Promoting the green school partnership network assist school with the developing campus environmental policy, managing campus, building and environment and promoting school Environmental Education and environmental lifestyles UNESCO (1972). It also recommend that promotion Environmental Education activities that include coordinating with academic group, civil groups, museum and education institutions to hold Environmental Education forums, seminars and various Environmental Education activities. It also encourages schools to establish professional advancement groups for Environmental Education teachers and enhance the Environmental knowledge of teachers. Thus the study aims at identifying ways of enhancing environmental education in secondary schools in Dagoretti-west district.

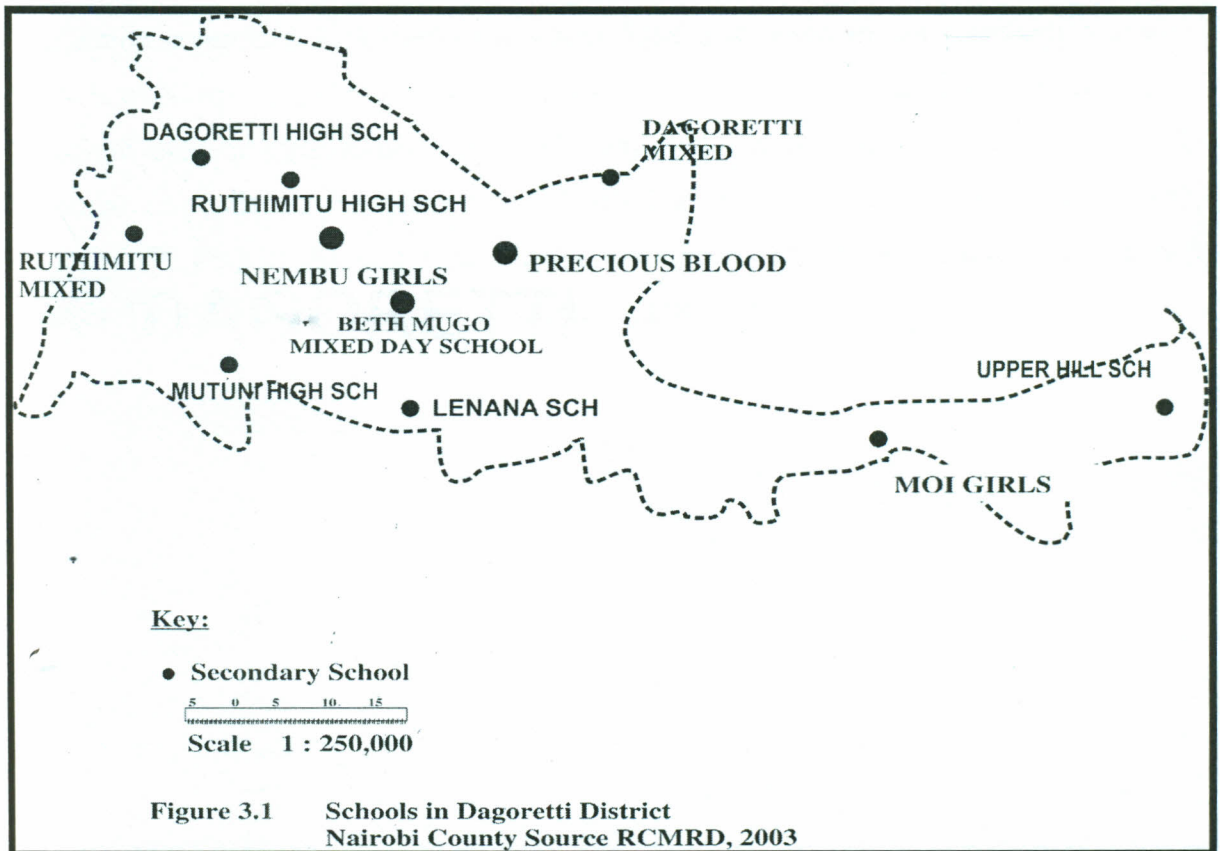
CHAPTER THREE: RESEARCH METHODOLOGY

3.1: Introduction

This chapter discusses the study area, research design, and population under study, sampling procedure and sample size of the study according to Orodho, (2005). It also describes the data collection instruments and procedures as well as modes for data analysis. The study is directed to Secondary schools because this is where we have youth population who are a majority and most active group of the Kenyan population according to Ominde, (1988).

3.2 Study Area

The study was conducted in Dagoretti-west sub-county, Nairobi County. The study was done in eleven public secondary schools as shown in Figure 3.1.



Source: Regional Centre for Mapping of Resources for Development (2003)

Figure 3.1: Secondary schools in Dagoretti-west sub-county, Nairobi County, Kenya.

3.3 Research Design

A survey method was adopted, that enabled an in-depth investigation into environmental awareness levels of teachers and students in secondary schools in Dagoretti west sub-county. The study aimed at collecting information from the teachers and students in public secondary schools in Dagoretti-west sub-county on the role of school administrators including student leaders in environmental education. Both primary and secondary sources of data were used. Primary sources of data include questionnaires while secondary sources include journal articles, Government reports, theses and dissertation, and books.

3.3.1 Target Population

The study targeted eleven categories of respondents selected in eleven secondary schools target population comprised 8,299 potential respondents distributed in ten secondary schools. The schools with target populations exceeding 1000 potential respondents were Lenana, Upper Hill, Dagoretti and Moi girls. Except for Mutuini and Beth Mugo mixed secondary school with 402 potential respondents, the other five schools had 500 – 1000 potential respondents. The majority (93.8%) of the target population were secondary schools students including their leaders. Table 3.1 shows the target population frame.

Table 3.1: Total population size frame of every school in Dagoretti west sub-county.

Administrator	Lenana	Upper Hill	Dagoretti	Precious Blood Riruta	Moi Girls	Nembu	Ruthimitu Mixed	Ruthimitu Girls	Dagoretti Mixed	Mutuini	Beth Mugo mixed	Total
Headteacher	1	1	1	1	1	1	1	1	1	1	1	11
Deputy Headteacher	1	1	1	1	1	1	1	1	1	1	1	11
Heads of Departments												
Class teacher	20	20	20	16	20	12	16	12	12	8	8	164
Head student	1	1	1	1	1	1	1	1	1	1	1	11
Duty prefect per week	8	7	7	15	6	3	4	2	3	3	3	61
Monitor	20	20	20	16	20	12	16	4	4	8	8	164
Club patron	6	5	6	4	6	4	3	3	3	3	3	46
Club chair	6	5	6	4	6	4	3	3	3	3	3	46
Ordinary students	1200	1112	1000	600	1080	540	720	560	600	371	371	8154
Total	1266	1175	1065	661	1144	581	768	598	639	402	402	8701

3.2.2 Sample size estimate

Two heads of departments of science and humanities in every school were also used as subject of investigation since their departments emphasize Environmental Education. Out of the total number of classes in every school, 4 class teachers and 4 monitors were randomly selected while out of the total number of duty prefects in every school in a week, 2 duty prefects were randomly selected. Clubs that emphasize Environmental Education, 1 patron and 2 chairs of the club was also randomly selected from the total number of clubs in a school. Ordinary students representing forms one to form four classes were randomly selected from the total number of students in every school and were 6 in number.

In order to ensure that the subjects had equal chance of inclusion in the sample, simple random sampling was conducted. Titles of subjects taught were written on pieces of papers which were folded and put in opaque boxes respectively, mixed thoroughly and finally picked to draw without looking until the required sample was realized for every subject to be investigated.

The following factors influenced how the sample size was determined for this study: Cost considerations (e.g., maximum budget, desire to minimize cost), administrative concerns (e.g., complexity of the design, research deadlines), minimum acceptable level of precision (50%), Confidence level ($\alpha = 0.05$) and variability within the population or subpopulation ($\alpha^2 = 1$).

Table 3.2 below shows the sampling frame used to pick a sample of 264 respondents from the ten schools studied and from the ten categories of respondents selected in each secondary school in the study area.

The standard sample size (n) would be:

$$n = \frac{z^2 p \cdot q}{e^2} = \frac{1.96 \times 0.5 \times 0.5}{(0.05)^2} = 384 \text{ (or 4.63\% to 3.18\% or 264 respondents.)}$$

This sample size was adjusted because within sub-population variability was low and because of cost considerations. Mugenda and Mugenda, (2003) suggests this approach is satisfactory.

Table 3.2: Sampling frame used to obtain cost effective sample size required for this study.

Administrator	Rationale per school	Lenana	Upper Hill	Dagoretti	P.B Riruta	Moi Girls	Nembu	Ruthimitu Mixed	Ruthimitu Girls	Dagoretti Mixed	Mutuini	Beth Mugo mixed	Total
Head teacher	1	1	1	1	1	1	1	1	1	1	1	1	1
Deputy Head teacher	1	1	1	1	1	1	1	1	1	1	1	1	1
Heads of Departments	2	2	2	2	2	2	2	2	2	2	2	2	2
Class teacher	4	4	4	4	4	4	4	4	4	4	4	4	4
Head student	1	1	1	1	1	1	1	1	1	1	1	1	1
Duty prefect per week	2	2	2	2	2	2	2	2	2	2	2	2	2
Monitor	4	4	4	4	4	4	4	4	4	4	4	4	4
Club patron	1	1	1	1	1	1	1	1	1	1	1	1	1
Club chair	2	2	2	2	2	2	2	2	2	2	2	2	2
Ordinary students	6	6	6	6	6	6	6	6	6	6	6	6	6
Total	24	24	24	24	24	24	24	24	24	24	24	24	24

3.4 Research Instruments

A tentative questionnaire was developed based on the issues targeted for investigation. The investigator defined precisely the information desired and wrote as few questions as possible to obtain it. The aim was to obtain feedback from a representative sample of potential respondents. In designing the questionnaire form the following conditions were put into account: that it be easy to read and understand, that it be concise and easy to complete and that it measures specific variables of Environmental Education. Structured questionnaires were used to collect data from the teachers and students in the study area. In this both qualitative and quantitative data were collected, Mugenda and Mugenda (2003).

3.5 Piloting of research instruments

A pilot survey was carried out in two schools outside Dagoretti sub-county. This enabled the researcher to gauge: the applicability of the survey tool or the questionnaire, the average time required to take a survey from one respondent and to determine the approximate budget required for the survey. After the piloting, necessary correction were made on the questionnaire to ensure that only relevant data was collected during the actual survey.

3.6 Data Analysis

All data collected were analyzed using Statistical Package for Social Scientists (SPSS). For easy management and longevity of the data, they were captured in Ms-Excel. All data were entered and verified after effective coding. Data were then scrutinized in relation to the objective of the survey, otherwise with a potential abundance data; vast numbers of irrelevance summaries would be produced. Checking for Inconsistencies, anomalies, missing values, outliers (say data cleaning) was done using SPSS syntax. Analysis was descriptive in nature. In the data presented in this report, results for each item are based upon the number of cases which had valid data for that item.

Descriptive statistics were aimed in identifying the pattern of the data and consistency of the responses in each of the identified factors influencing Environmental Education of the schools. Results were then presented in tables and graphs with emphasis on graphical displaced.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.1: Introduction

This chapter gives details of key research findings and their discussions. Discussions and presentations were captured according to the objectives which included: to establish the level of awareness on Environmental Education activities among teachers and learners in secondary school, to find out what Environmental Education activities existed in secondary schools and factors that hindered their delivery, to identify the relationship between teachers' awareness of Environmental Education and students' understanding and participation in environmental activities and to find out ways in which Environmental Education activities in schools can be enhanced. Discussions were made based on the information contained on the implication of the finding cited linking it to all sections of the study from the background, objectives and literature reviewed. The researcher interviewed respondents in eleven (11) schools in Dagoretti area in Nairobi County. Every school interviewed had one representative respondent as a head student, two duty prefects, four class monitors in every stream, two club chairs in two environmental clubs and ordinary students were six in every school.

4.2 Socio Demographic Characteristics of student respondents

4.2.1 Gender of Students

According to table 4.1, 63%, (n=104) of the respondents were males with the rest 37% (n=61) being females. This could be attributed to the mixed schools having more boys than girls leading to a higher number of male students than the female students.

Table 4.1: Gender of the student Respondent

Gender	Frequency	Percent
Male	104	63
Female	61	37
Total	165	100

4.2.2 Classes Sampled

Majority 43% (n=71) of the respondents were in form three, while 21% (n=35) were in form two, 30% (n=50) were in form four and 6% (n=9) were in form one.

Table 4.2: Distribution of student respondents according to level of study in selected schools.

Classes	Frequency	Percent
Form 1	9	6
Form 2	35	21
Form 3	71	43
Form 4	50	30
Total	165	100

From table 4.2, form three students had the highest number of respondents interviewed. This was because they are normally more than students in other levels. Furthermore, during data collection, form fours were preparing for their final exams and hence were not allowed to participate in the survey

Table 4.3 shows the number of student respondents holding positions of responsibilities in the targeted schools.

Table 4.3: Students Position

Student position	Frequency	Percentage
Head student	11	7
Duty prefect	22	13
Monitor	44	27
Club chair	22	13
Other students	66	40
Total	165	100

Most of the students 40% (n=66) were not holding positions of responsibility. The samples taken were in proportion with the number of students in each category of students holding some responsibility in the school. Other respondents holding positions of responsibility were class monitors 27% (n=44), club chair persons and duty prefects 13% (n=22) and head students 7% (n=11).

4.1.3 Student respondents belonging to Environmental Clubs in schools interviewed

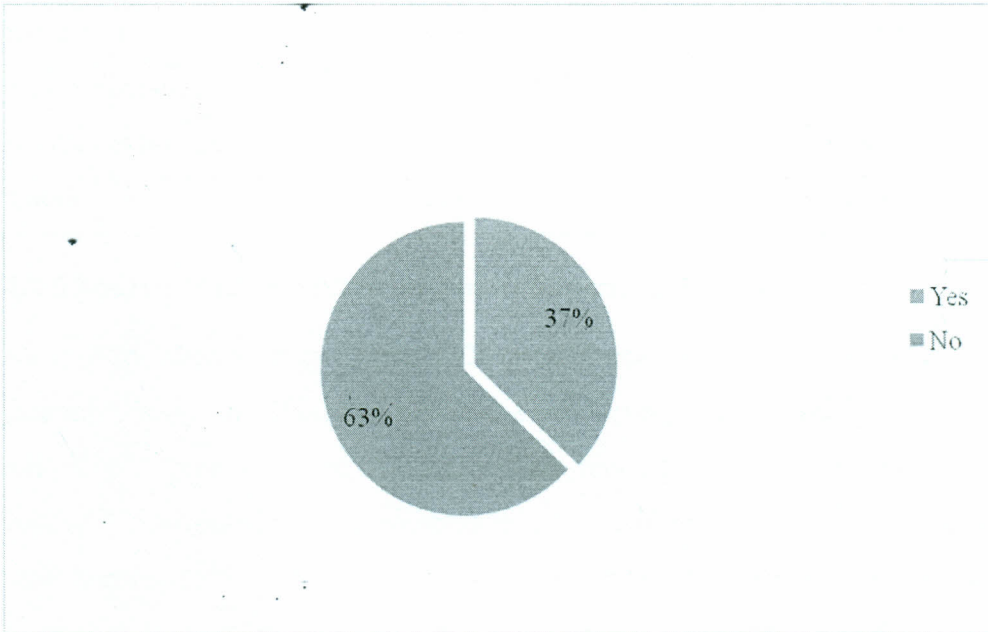


Figure 4.1: Student respondents belonging to Environmental Clubs in school interviewed.

Most of the student respondents 63% did not belong to environmental clubs in school in Dagoretti sub-county while 37% belonged to environmental clubs according to Figure 4.1. This is evident in that majority of the students involve themselves in other clubs and activities such as the music and drama club, the wildlife club, the scouts club, and the young farmers club among others. All these clubs and other school activities are allocated at the same time after lessons in the evening and students divide themselves in various activities leaving environmental clubs with fewer students.

4.2.4 Exposure to Environmental Education in any Subject

Most of the respondents 82% (n=136) had exposure to Environmental Education while 18% (n=29) did not have the exposure in any subject (Table 4.4). The subjects that students had exposure to environmental education were geography, agriculture and social studies and have few topics covering environmental issues. The rest of the students in form three and four did not cover these subjects in their in secondary education.

Table 4.4: Exposure to Environmental Education in any Subject

Response	Frequency	Percent
Yes (Exposure)	136	82
No (No exposure)	29	18
Total	165	100

4.2.5 Source of Information on Environmental Education

Most of the student respondents 49% (n=80) received information on environmental education through television. This was because almost every homestead had a television set and those who don't have could access television services from social places. About 33% (n=55) accessed environmental information through reading newspapers in the school library and at their homes, 15% (n=26) accessed environmental information through the internet, 2% (n=3) through radio and only 1% (n=1) through municipal library (Table 4.5).

Table 4.5: Students Source of Information on Environmental Education

Source of Information	Frequency	Percent
Internet	26	15
Television	80	49
Newspaper	55	33
Radio	3	2
Municipal library	1	1
Total	165	100

Results indicated that environmental education delivered by television or print media is the highest since information sources are mostly owned by corporation that are simultaneously trying to reach to the public. However, this cannot be an assured method of acquiring

Environmental Education, though most of the news media report environmental problems or cover them in highly dramatized ways (Carly, 2007)

4.2.6 Education Levels of Parents

The education level for majority 61% (n=101) of the respondents' parents had attained tertiary education, 30% (n=50) had attained secondary education, 6% (n=10) had attained primary education, while 2% (n=4) had no formal education (Table 4.6). The level of education of parents is an important aspect in educating students on matters of environmental education in the society. Most of parents had attained college and university education that covered most of environmental issues and this helped their children now the students to gain practical knowledge on environmental issues at home to reinforce what they are taught in schools.

Table 4.6: Education Levels of Parents

Education level	Frequency	Percent
No education	5	3
Primary education	10	6
Secondary education	49	30
Tertiary education	101	61
Total	165	100

4.2.7 Occupation of Parents

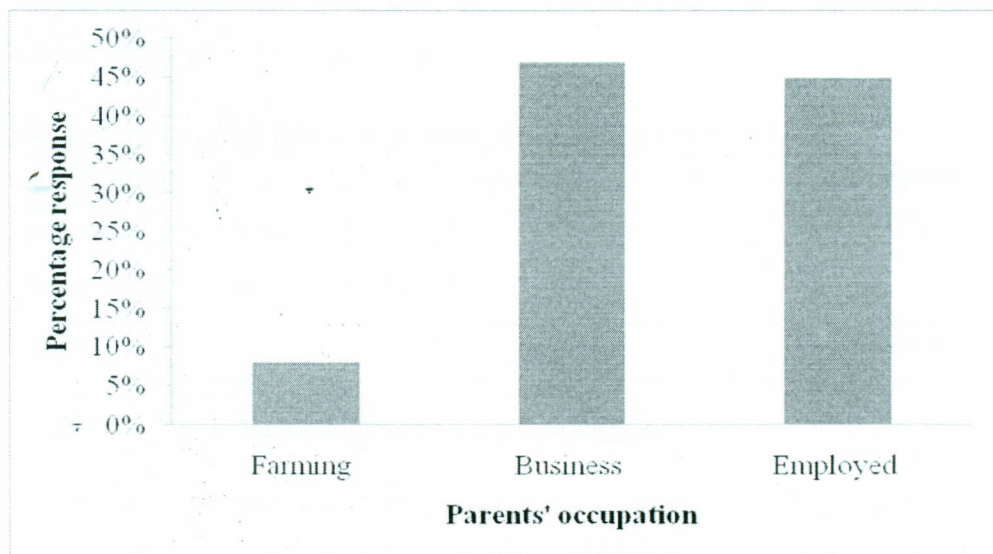


Figure 4.2: Parents' Occupation

Most of the respondents' parents 47% were business people, 45% of the parents were formally employed while only 8% of the parents were farmers as shown in Figure 4.2. Parents who are business people involve themselves in activities ranging from small micro enterprises to big businesses that help them get finances to pay school fees. Those involved in employment might be either in government offices or in private sector but in different professions. They also use their income to cater for fees, expenses for their kids and other household expenses. Very few numbers involve themselves in urban farming and environmental conservation activities. Most of respondents interviewed had parents that lived in urban areas where farming activities were very minimal. Rural parents practiced subsistence farming and sold farm produce to cater for school fees expenses. Farmers were more conversant with environmental issues than business people or employed parents. However, they had lower education but were more practical in showing environmental problems.

4.2.8 Type of family

Family is a very important aspect to consider when creating awareness and participation in environmental education activities to our siblings and students. According to table 4.7, 72% (n=119) of the respondents were from nuclear families. Nuclear families were the majority in this case because they taught and created awareness to their siblings who are students to become better environmental managers in the future. Those student respondents from single parent families had 28% (n=46) and they still give services of awareness but not as much as the nuclear or bi-parental families did.

Table 4.7: Type of families of student respondents

Family type	Frequency	Percent
Nuclear (bi-parental)	119	72
Single family (unparental)	46	28
Total	165	100

4.2.9 Size of the families of student respondents

The mean size of the family in the study area was 5 and with a standard deviation of 1.95. The bigger the size of the family, the more difficulty it had in paying school fees and hence monitoring the student in school. This was evident in that most of the families that had many

members did not have jobs earning high salaries to maintain the family. Those who involved themselves in farming activities were not doing good and farming business could not maintain the family had difficulties in paying school fees.

4.3: Students Level of Awareness on Environmental Aspects

According to Hassan et al., (2009), high environmental awareness prepares students to become responsible individuals who contribute to harmonious society and nation. Table 4.8 shows average level of awareness on environmental aspects. Waste management and disposal had a mean of 3.75 with standard deviation of 1.36 meaning that students are not much aware of environmental aspects stated in the table. What they do most is to collect litter around the school and dispose it in pit. There are other aspects of sorting from the source and disposing according to the type of waste which they were not conversant with. The other aspect is impact in deforestation which had a mean score of 3.74 with standard deviation of 1.44. Most of students had moderate knowledge of impacts of deforestation which include just mentioning a few climate change, desertification, land degradation, increase in carbon dioxide in the atmosphere and global warming among others. This makes them unable to comprehend impacts of deforestation despite many activities of planting trees around school compound.

Table 4.8: Students Level of Awareness on Environmental Aspects

Students' awareness	Mean	Standard Deviation
Waste management and disposal	3.75	1.36
Impacts of deforestation	3.74	1.44
Water pollution	3.65	1.41
Air pollution	3.62	1.45
Land pollution	3.51	1.46
Climate change	3.16	1.44
Effects of global warming	3.13	1.40
Effects of ozone layer depletion	3.11	1.49

NB: Maximum score of 5 was high awareness or very aware

Water pollution is another aspect students are not much aware of which has a mean of 3.65 and Std. 1.41. Runoffs from school compound to other places causes soil erosion which affect environment negatively. We recommended them to harvest water that can be used in various

activities in school such as watering flower beds, washing class rooms, watering tree seedlings just to mention a few. Land and air pollution are not common in the study area schools but it is important to create awareness to students of their impact on the environment. Climate change and global warming are new aspects that students have to learn. They have a mean of 3.16 and SD 1.44 and mean 3.13 and SD 1.40 respectively. Most of the students in schools interviewed were not aware of the two terms but few knew the terms existed despite environmental education being taught in school subjects. Ozone layer depletion was another new term students heard about but did not know how it occurred and its impacts on earth and human health. All these aspects will be taught in school curriculum to create awareness to students.

4.4 Students' Perception on Various Environmental Aspects

4.4.1 In Favour of Clean School Compound

According to Table 4.9, the majority 85% (n=140) of the students agreed or strongly agreed with the statement that they were in favour of clean school compound. This is because they have a mandate to clean the compound and ensuring that dirt or litter did not mostly occur. Trenches have to be cleaned, cutting long grass, weeding flower beds and agricultural terraces, cleaning grasses and also pruning trees. 11% (n=18) neither agreed nor disagreed because they did not see the reason to maintain or take care of small seedlings in school, cleaning trenches and also classrooms while only 4% (n=7) disagreed or strongly disagreed that they were in favour of clean school compound because they did not want to participate in school cleaning. This will help in developing a character of getting committed in issues of community good and responsibilities of citizenship and the mission of education.

Table 4.9: Students in Favour of Clean School Compound

Responses	Frequency	Percent
Strongly disagree	4	2
Disagree	3	2
Neutral	18	11
Agree	63	38
Strongly agree	77	47
Total	165	100

4.4.2 Law to have EE taught in Schools

From the results obtained from figure 4.3, it is noted that the reception of EE and how seriously it is taken by students is a matter of concern. The results imply that though the majority of the students 81% agree and strongly agreed that EE is important and the government should pass the law to have environmental education be taught in school curriculum, it is still evident that some students do not treat it seriously indicated by 10%. This study reveals that students in urban secondary school strongly agree that EE is as important as any other subject in secondary schools. It is also observed that, the study is consistent with the findings made by Shiyakumar on Environmental Attitude among the Secondary School Students. He found out that students in urban areas have better environmental attitudes (Shiyakumar, 2011).

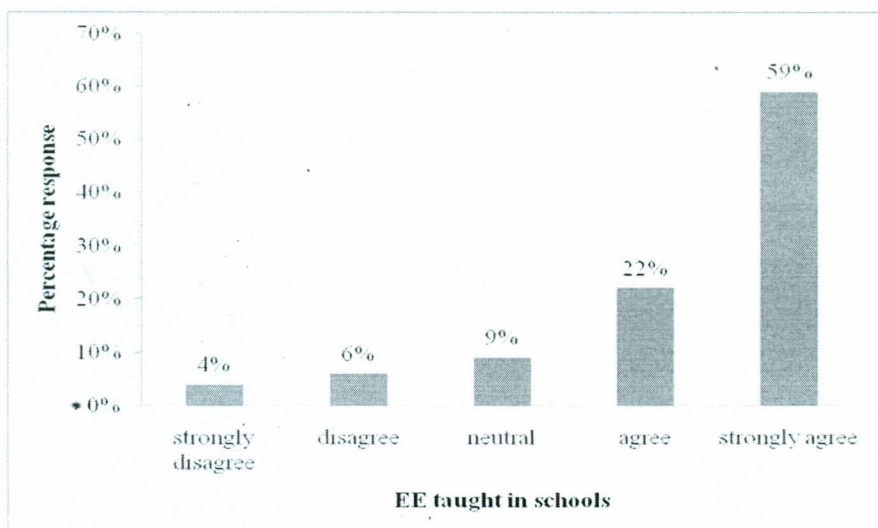


Figure 4.3: Government should pass law to have EE taught as a subject

4.4.3 Interest in Conserving the Environment

Table 4.10: Student spending time working on environmental activities

Responses	Frequency	Percent
Strongly disagree	6	4
Disagree	7	4
Neutral	29	18
Agree	74	45
Strongly agree	49	29
Total	165	100

Students' attitude towards environmental conservation in the school, outside school and economic development shows students mental position towards management of the environment. It also highlights attitudes towards competing priorities of sustainable development. Respondents were asked if they were working to help in environmental conservation and the results were as shown in Table 4.10. Most of the students 74% (n=123) agreed and strongly agreed that they were interested in spending time working to help environment conservation. They said that they will be helping in keeping school compound clean by cutting long grasses, clearing bushes as well as planting more trees around school compound, thus, 18% (n=29) of the students never agreed nor disagreed. They were not sure whether to conserve environment or not while 8% (n=13) disagreed with the request of spending time working to help in environmental conservation reason being that they didn't want to involve themselves in environmental conservation. This is a clear indication that majority of Secondary School students are aware of the role of natural resources and need to protect and conserve the environment.

4.3.4 Environmental Clubs for all

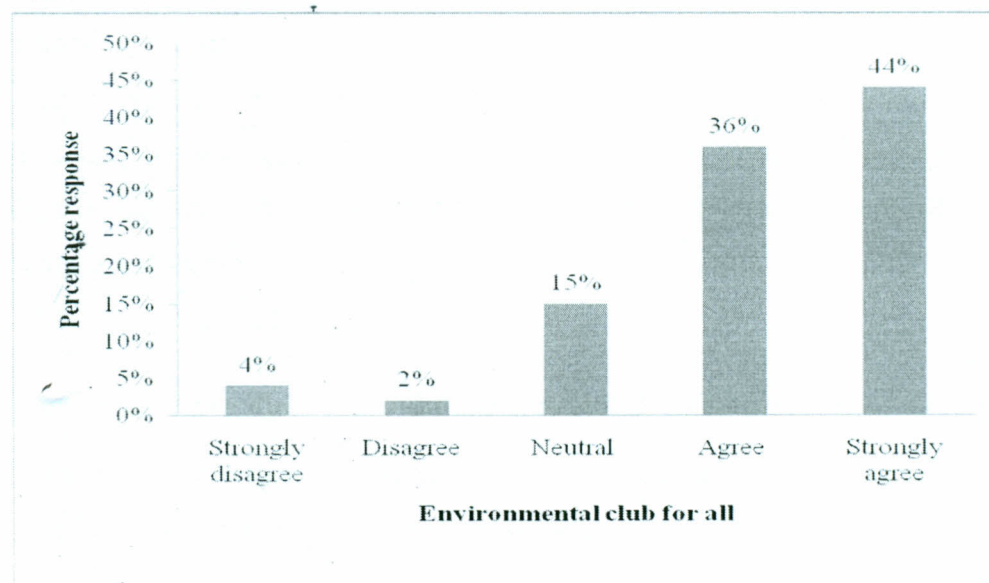


Figure 4.4: Being in Environmental Clubs

Figure 4.4 shows that 80% of the students agreed that if everybody were a member of environmental related clubs, our school compound would look more clean and beautiful. They agreed to join environmental clubs because they could familiarize themselves with various aspects of environmental protection and conservation matters such as planting of trees around

school, cutting of long grasses and bush clearing, draining drainage collection of garbage among others as mandated by their teachers. 15% of the students neither agreed nor disagreed because they did not know importance of being in environmental club in school and how it could help then to conserve environment not only in school but also in the society at large. 6% disagreed with the statement that if everybody were a member of environmental related clubs, our school compound would look more clean and beautiful. This is because they are unaware of environmental conservation information and activities and do not belong to any environmental club.

Regarding the of identity, it was found that members not only relate to the club, they are member of; they identify with the clubs' values and feel a strong sense of belonging to the club and its other members. Some of the clubs in the secondary schools and their popularity amongst students include but are not limited to Agriculture, business club, wildlife club, environmental club, debating, Christian union, drama club, Health and Technology clubs. Club membership is not enough, it is important to find out the level of students participation in club activities.

Mgimwa and Marie (2011) in his study on Club Environment and School Governance in Secondary Schools Field Work Study in Morogoro and Pwani, Tanzania, realized that Fema Clubs were among the most popular clubs. It was also noted that the club environment in secondary schools varies from school to school. The studies also showed that clubs' specific themes and structure enabled the youth to become good citizens in all aspects by stimulating voluntary community engagement.

4.3.5 Trust Environmental Education to Resolve Environmental Problems

Table 4.11 shows that 39% (n=65) and 35% (n=57) of student respondents somewhat trust and completely trust respectively that environmental education can resolve a lot of environmental problems. These problems could include land degradation through soil erosion, water runoff, problem of bare land because of unavailability of cover crops or grass, unclean air due to lack of tree cover around school, planting trees for live fences along foot paths to protect soil erosion. 13% (n=21) neither trusted nor distrust while 6% (n=10) trusts that environmental education cannot resolve environmental problems due to the fact that they do not embrace it.

Table 4.11: Trust on Environmental Education to resolve Environmental Problems

Responses	Frequency	Percent
Completely trust	2	1
Somewhat distrust	8	5
Neither trust nor distrust	21	13
Somewhat trust	65	39
Completely trust	69	42
Total	165	100

This study reviews that majority of students in Secondary schools completely trust that Environmental Education is important, meaning they the subjects they learn in class about environment education will help in resolving small problems they experience in school regarding conservation and protection. It is still evident that some students completely distrust it. This meant that they have not embraced environmental education in their day today activities in school despite the subject being taught in their schools.

4.3.6 Trust Environmental Education to Resolve Problem in Dagoretti west sub-county.

Table 4.12: Trust on Environmental Education to Resolve Problem in Dagoretti west sub-county.

Response	Frequency	Percent
Completely distrust	5	3
Somewhat distrust	12	7
Neither trust nor distrust	31	19
Somewhat trust	60	36
Completely trust	57	35
Total	165	100

From the results obtained in table 4.12, majority of the students 36% (n=60) somewhat trust and 35% (n=57) completely trust that environmental education could resolve environmental problems in Dagoretti, 19% (n=31) neither trusted nor distrusted while 7% (n=12) somewhat distrust and 3% (n=5) completely distrust that Environmental Education would resolve

environmental problems in Dagoretti. This study reviews that majority of students in Secondary schools completely trust that Environmental Education is important. This was realized through tree planting and cleanup initiatives. The results obtained imply that students in secondary schools are responsive to the cleanup and tree planting initiatives.

More so, this implies that students' participation in community service and community affairs is supported in Dagoretti. This indicates that secondary school students get sufficient community exposure to help them play a meaningful role in addressing community service in the area. They also develop a character of getting committed in issues of Dagoretti wellbeing. This is evident as the study shows that young people rarely participate in volunteering activities. It is still evident that some students completely distrust it because they are not conversant with conservation of environment issues.

4.3.7 With Dustbin in the School Compound, the Environment looks tidier

According to Table 4.13 below, most of the respondents 79% (n=130) agree that with dustbin in the school compounds, the environment would look tidier, 15% (n=24) neither agreed nor disagreed while 6% (n=11) disagreed that with dustbin in the school compounds, the environment would look much tidier. This shows that students in Secondary schools have taken the responsibility of ensuring cleanliness of the school compound by having dustbins and placing dirt in those dustbins. This ensures that litter is not all over the school compound but placed in the dustbin.

Table 4.13: Dustbins makes the Environment Tidier

Response	Frequency	Percent
Strongly disagree	4	2
Disagree	7	4
Neutral	24	15
Agree	57	35
Strongly agree	73	44
Total	165	100

4.3.8 Plastic waste is a Major Problem

From the results obtained from table 4.14, it was realized that majority of the respondents 37% (n=61) strongly agreed and 23% (n=38) agreed that plastic waste is a major problem, 19% (n=31) neither agreed nor disagreed while 22% (n=35) disagreed that plastic is a major problem. Plastics are non biodegradable and cause pollution to our environment and a menace not only in schools but also to the community at large. There are proposed regulations in schools that they should be burned in pits rather than being buried.

Table 4.14: Plastic as a Major Problem

Responses	Frequency	Percent
Strongly disagree	14	9
Disagree	21	13
Neutral	31	19
Agree	38	23
Strongly agree	61	37
Total	165	100

4.4 Socio-Demographic Characteristics of Teachers

4.4.1 Position in the School

According to results from table 4.15, majority of the teaching staff respondents 54% (n=54) were class teachers, 28% (n=28) were heads of departments, 7% (n=7) were club patrons, 6% (n=6) were deputy principals while 5% (n=5) were principals

Table 4.15: Position of Teachers in Schools

Positions	Frequency	Percent
Principal	5	5
Deputy principal	6	6
Head of department	28	28
Class teacher	54	54
Club patron	7	7
Total	100	100

4.4.2 Age of the Teachers

Table 4.16 indicates that majority of the respondents 40% (n=40) were aged between 38 and 47 years, 29% (n=29) were aged between 28 and 37 years, 22% (n=22) were aged between 48 and 57 years while only 9% (n=9) were aged between 18 and 27 years. This indicates that the highest number of the teachers fell in the category of 38 and 47 years. These teachers have a lot of experience in teaching profession more so in environmental education issues than any other age category. Younger teachers and older teachers had less experience in environmental education.

Table 4.16: Age of the Teachers

Age	Frequency	Percent
18-27 years	9	9
28-37 years	29	29
38-47 years	40	40
48-57 years	22	22
58 and above	-	-
Total	100	100

4.4.3: Teachers' Teaching Experience

The teaching experience of most teachers was 40 years which concur with table 4.16 where majority were 38-47years. This shows that majority of teachers have been in school for long and the more the teachers are experienced, the more they create awareness to students since the content knowledge for teaching was also more.

4.4.4: Education Level of the Teachers

Table 4.17 indicate that of the respondents 77% (n=77) were degree holders, 11% (n=11) were diploma holders, 8% (n=8) were postgraduate (Master) holder while 4% (n=4) were post graduate diploma holders. Most of these universities and colleges offer environmental education units in their education systems showing that most teachers are highly qualified and capable of creating awareness in environmental education activities and more so it shows that the teachers have a strong academic background.

Table 4.17: Education Levels of the Teachers

Level of education	Frequency	Percent
Post graduate (Masters)	8	8
Degree	77	77
Post graduate diploma	4	4
Diploma	11	11
Total	100	100

4.4.5 Type of School

According to figure 4.5, the results indicate that 40% of the schools sampled were boys' schools, 40% were girls' school while 20% were mixed schools. From the results it was found that boys and girls schools only had the same number of students. This determines the availability of human resources in terms of physical in a school and has been the norm that most single sex boarding schools have more resources and active when it comes to Environmental Education activities than other type of schools. These boys and girls collectively involve themselves in environmental education activities, such as garbage collection, tree planting, watering tree nursery beds, water harvesting among others than students in mixed schools. Those in mixed schools were mostly day scholars who went home in the evening after evening preps. This was the time when students from boarding schools involve themselves in environmental education activities

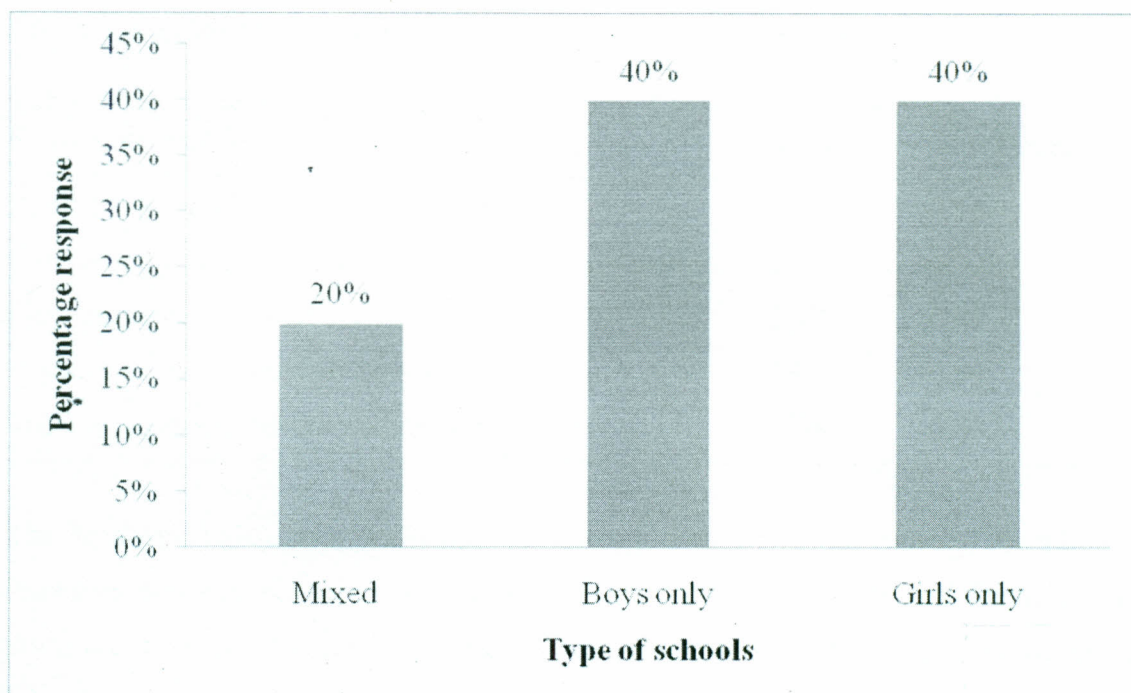


Figure 4.5: Type of Schools in Dagoretti-west sub-county

4.4.6 Involved in Environmental Club

From the results obtained in the table 4.18 below, majority 57% (n=57) of the teachers were involved in environmental clubs while 43% (n=43) were not involved in environmental clubs. Furthermore, results from the schools interviewed show that majority of these teachers came from boarding schools for both boys and girls.

Table 4.18: Teachers Involvement in Environmental Clubs

Response	Frequency	Percent
Yes	57	57
No	43	43
Total	100	100

They were either heading an environmental club or had the authority to give directions on what should be done in terms of enhancing environment around the schools.

4.5 Teachers Involvement in Various Environmental Aspects

Table 4.19: Teachers Involvement in Various Environmental Aspects

Environmental aspects	Mean	Std. Deviation
Directed resources towards conservation	2.36	0.66
Controlling resources used in environmental awareness	2.31	0.72
Planning environmental activities	2.17	0.80
Organizing environmental activities	2.04	0.59
Staffing regarding environmental awareness	2.64	0.65

The teachers have been involved in various environmental aspects including directing resources towards conservation (mean of 2.36). These resources are financial and human resources used to enhance environment around the schools and the communities around these schools and are directed by the principal. Controlling resources towards environmental awareness (mean of 2.31) are less often, and directed by the principal, planning environmental activities (name few activities) (mean of 2.17) which are done by environmental club, organizing environmental activities (mean of 2.04) it's often and by teachers, and staffing regarding environmental awareness (mean of 2.64) it's often done by teachers (Table 4.19).

4.6 Teachers Awareness Levels on Environmental Aspects

According to Table 4.20 below, the teachers were fairly aware of most aspects of the environment including water pollution (mean of 4.07), air pollution (mean of 3.99), waste management and disposal (mean of 3.97). This influences the level of student's awareness on environmental aspects positively. On a general note however, there is a positive relationship in the knowledge of management of natural resource and environment in the study area. It can be argued that EE takes place even outside classroom. Secondary school students are equally exposed to EE content while outside the classroom. This might be the reason as to why some institutions are well known than others. This is a call to diversify EE approaches both within and without secondary school set up to give learners much needed exposure that is key to participation in environmental activities.

Table 4.20: Teachers Awareness Levels on various Environmental Aspects

Environmental aspects	Mean	Std. Deviation
Water pollution	4.07	0.95
Air pollution	3.99	0.88
Waste management and disposal	3.97	0.97
Impacts of deforestation	3.90	0.96
Land pollution	3.78	1.12
Climate change	3.57	1.21
Effects of global warming	3.52	1.21
Effects of ozone layer depletion	3.51	1.22

4.7 Environmental Activities carried out in Schools as a Result of Awareness

According to table 4.21, most of the activities carried out in schools as a result of awareness includes tree planting with a mean of 4.08. Most of the schools interviewed practice tree planting which helps to make schools look green and beautiful, creating micro climate as well as providing shade when students and teachers relax during their free time.

Table 4.21: Environmental activities carried out in schools as a result of awareness

Projects undertaken	Mean	Std. Deviation
Tree planting	4.08	0.89
Water resource management	3.85	0.82
Waste management	3.77	1.14
Forest cover education	3.61	1.09
Use of environmentally friendly resources	3.47	1.07
Environmental public awareness creation	3.45	1.08
Environmental communication	3.38	1.01
Establishment of environmental awareness campaigns	3.38	1.14
Plastic waste management education	3.12	1.16

Water resource management had a mean of 3.85 whereby water harvested is used to water tree seedlings around school during dry seasons and other activities such as cleaning classes and

verandas, cooking, drinking among others. One of the primary goals of Environmental Education is to empower the world population to maintain and enhance environmental quality. One of the key specific objectives is that environmental education should provide individuals and social groups with an opportunity and capacity to be actively involved at all levels working towards the resolution of environmental problems (UNESCO, 1999).

Waste management had a mean of 3.77, which indicate that most of these schools interviewed do manage their waste well but collecting all kinds of wastes and throwing in compost pit, left over foods are given to animals and others disposed wisely. Forest cover education had a mean of 3.61 indicated that most of the schools under the study plant trees in deforested areas to promote tree cover and creating a forest cover. Other activities were use of environmentally friendly resources, environmental public awareness creation, environmental communication, establishment of environmental awareness campaigns, plastic waste management education are fairly utilized and more of these activities should be emphasized in schools to increase the level of awareness by both students and teachers.

From the study, it was also found out that students in both informal and formal set ups of urban areas are less aware of emergent environmental issues. Considering environmental issues such as the ones raised above, it was noted that students are less aware of this and other emergent environmental terms and problems. This is a key indicator that learners are not being exposed to current and emergent environmental issues. This is a reflection of the contents of the curricular being used to train Environmental Education in secondary schools. The findings of this study are consistent with conclusion made by Harun et al, (2011).

Besides the findings in this study, there are other studies done that have found out that indeed the level of environmental awareness changes depending on other factors. Research done by Kulasekara, (2012) postulated important finding involving environmental awareness. They included significant difference between male and female in respect of their Environmental Awareness, significant difference between rural and urban area students in respect of their Environmental Awareness and significant difference between arts and science group students in respect of their Environmental Awareness.

4.8 Relationship between Teachers' Awareness and Students Understanding of Environmental Education Activities

There was a positive and significant correlation ($r=0.202$, $p=0.044$) between students understanding and teachers' awareness. This implies that the students' understanding increases with an increase in the teachers' awareness as shown by Table 4.22. Majority of the teachers offering environmental education in schools were very much aware of and understood environmental education. They transferred that knowledge to students through class lessons and practical work when doing environmental education activities on the ground. According to Asikhia (2010), students believe that teachers' qualifications do affect their academic performance hence there is need for teachers attend refresher training workshops.

Table 4.22: Relationship between teachers' awareness and students understanding of environmental education activities

		Students'	Teachers'
		understanding	awareness
Students' understanding	Correlation Coefficient	1.000	0.202(*)
	Sig. (2-tailed)	.	0.044
Teachers' awareness	Correlation Coefficient	0.202(*)	1.000
	Sig. (2-tailed)	0.044	.

* Correlation is significant at the 0.05 level (2-tailed).

4.9 Enhancing Environmental Education in Schools

The results shown in Figure 4.6 indicate that majority of the respondents 31% of all teachers and students need for identified awareness creation as the best way of enhancing environmental education. This is because of changes in environmental challenges, such as climate change, desertification, ozone layer depletion, deforestation, water catchment destruction, water air and soil pollution, soil erosion and green energy demands. This was followed by budgetary allocation for Environmental Education activities (27%) and training on Environmental Education (23%). School authorities should ensure that when budgeting for other expenditures in school curriculum should allocate substantial amount of money towards supporting environmental education activities and training students and teachers on how to conserve environment through initiatives such as tree planting and awareness creation in the neighbouring communities. Initiation of action plans and giving incentives are yet to be used to

enhance Environmental Education in schools. This shows that there is great need for Environmental Education being made compulsory subject in schools.

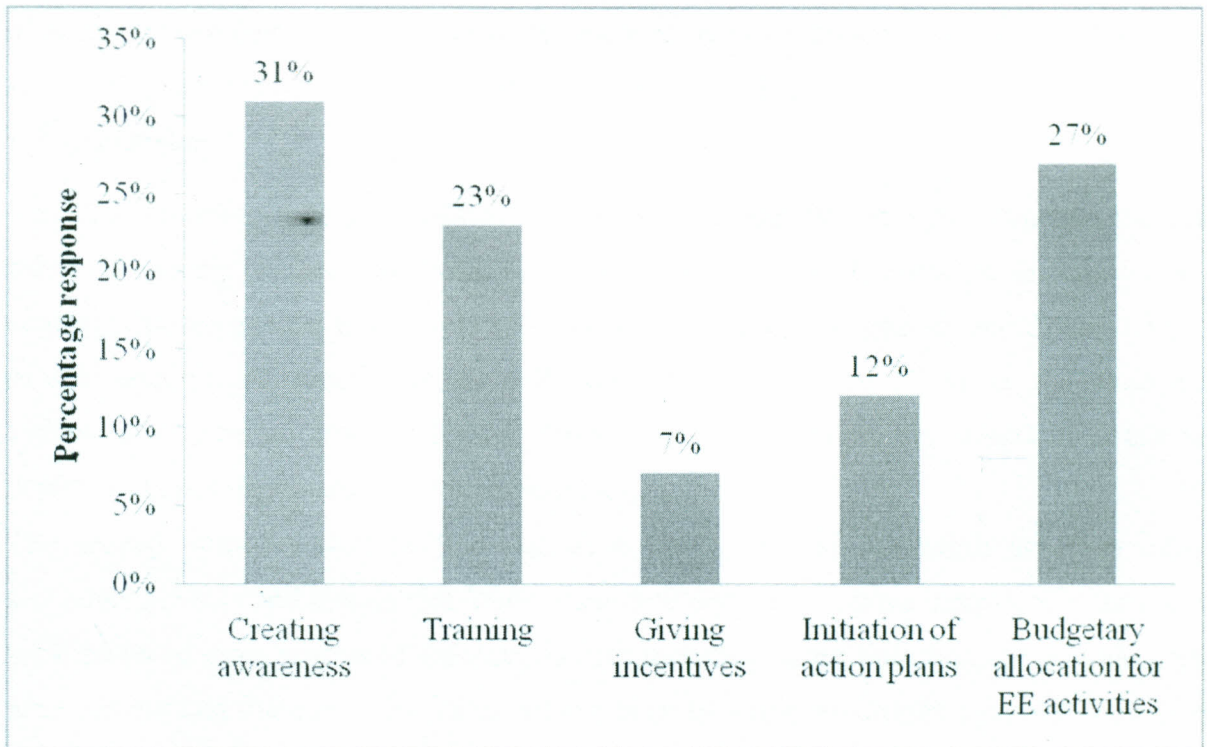


Figure 4.6: Enhancing Environmental Education in Schools

The findings of this study are consistent with the conclusions made by (Saiduddin, 2003). He noted that it is a convenient scapegoat to pass the blame and responsibility for the low academic performance to factors such as socio-economic status, family, culture and the learner apathy. Research conducted at Dagoretti west high schools showed that all learners are educatable, and that the way in which the schools are managed is the most critical factor determining the quality of environmental education for its learners.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1: Introduction

This chapter presents conclusion drawn from the study and recommendation that the researcher found necessary in addressing the shortcomings in the topic covered.

5.2 Conclusion

The first objective was to establish the level of awareness on Environmental Education activities among teachers and learners in secondary school. The results indicated that the students showed general high levels of awareness on waste management and disposal, impacts of deforestation, water pollution, air pollution and land pollution. However, the students had average awareness on climate change, effects of global warming and effects of Ozone layer depletion; hence there was need for sensitization.

The second objective was to find out what Environmental Education activities exist in secondary schools and factors that hinder their delivery. The findings indicate that the teachers were aware of most aspects of the environment including water pollution, air pollution, waste management and disposal. The teachers have been involved in various environmental aspects including teaching experience, directing resources towards conservation, controlling resources towards environmental awareness, planning environmental activities, organizing environmental activities and staffing regarding environmental awareness. The study found that, there were hindrances in the delivery of Environment Education which included, most subjects cover a few topics about Environment hence need for specialization, source of Environmental Education Information mostly was the Television hence need for textbooks, teachers were less involved in staffing, organizing, directing, planning and controlling hence need for them to be involved, need for increasing awareness of teachers by having more workshop, training among others.

The third objective was to identify the relationship between teachers' awareness of Environmental Education and students' understanding and participation in environmental activities. The results indicate that there is a positive significant relationship between students understanding and teachers' awareness. This implies that the students' understanding increases with an increase in the teachers' awareness.

The fourth objective was to find out ways in which Environmental Education activities in schools can be enhanced. The results indicate that majority of the respondents identified awareness creation as the best way of enhancing Environmental Education followed by budgetary allocation for Environmental Education activities and training on Environmental Education.

5.3 Recommendations

Based on the respondents' experience, the following recommendations were suggested in order to create awareness and enhance participation of secondary school students in environmental education in Dagoretti West District

1. The study recommends that there is need for improving teachers' levels of awareness in environmental aspects since this is likely to influence the levels of understanding of students which is envisaged to a change of attitude and skills in managing and taking care of the environment.
2. There is need to emphasize on improving Environmental Education activities carried in schools so that students can be molded holistically.
3. The study recommends that Environmental Educational material such as books and magazines be provided to schools since this will provide students and teachers with the information, they need to understand fundamental environmental issues and to take actions that will help protect our planet.
4. There is also a need for the government to come up with a ways of disposing plastics in an environmental friendly way such as recycling and reuse.
5. In fact, the process of providing more educational materials will increase students' and teachers' knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action.

5.3.1 Suggestions for Further Research

Future research that could add value to creation of awareness and enhancement of participation of secondary school students in environmental education in Dagoretti west sub county and globally could focus on, among others, the following themes:

1. More institutions of learning to acquire syllabus that entails environmental education to help more students to acquire skills in environmental education and help then enhance their participation and creation of awareness even in the society
2. Similar studies should be carried out to link secondary school students to be under one umbrella and have the same policies governing the use of environmental education to avoid conflicts between themselves and community at large.
3. Further research should be done on introduction of new technologies to help secondary school students and community members on how well they can benefit from environmental education to help conserve the environment.

REFERENCES

- Aini M. S. Nurizan, Yahaya and Fakhru'l-Rasi, A. (2007) Environmental comprehension and participation of Malaysia Secondary School students. *Environmental Education Research*, Vol 13, No. 1, February 2007, PP.17-31.
- Ajayi, T. (1988) A system approach towards remediation of academic failure in Nigerian schools. *Nigeria Journal of Educational Psychology*, 3, 1, 28-35.
- Allen, W. (2001) A news media perspective on environmental communication. *Bioscience*, Vol. 51, Issue 4, p289, 3p.
- Aremu, A.O. (2000) Academic performance 5 factor inventory. *Ibadan: Stirling-Horden Publishers*.
- Arenū, A.O. and Oluwole, D.A. (2001) Gender and birth order as predictors of normal pupil's anxiety pattern in examination. *Ibadan Journal of Educational Studies*, 1, (1), 1-7.
- Aremu, O.A and Sokan, B.O. (2003) A multi-causal evaluation of academic performance of nigerian learners: issues and implications for national development. Department of Guidance and Counselling, University of Ibadan, Ibadan.
- Asikhia, O.A. (2010) Students and Teachers' Perception of the Causes of Poor Academic Performance in Ogun State Secondary Schools [Nigeria]: Implications for Couselling for National Development. *European Journal of Social Sciences – Volume 13, Number 2*.
- Ballantyne, R, Connell, S., and Fien, J. (2004) Students as a catalyts of Environmental change: a framework of researching intergenerational influence through Environmental Education. *Environmental Education Research 2004*; 10(4); 523-543.
- Banks, L.D; Esler M. And Saltz, C. (2005) "Analysis of the K-12 component of the central Arizona-phoenix long-term ecological research (CAPLTER). Project 1998 to 2002". *Environmental Education Research*, 11/5, 2005: 649-663.
- Barker, M. and Rogers, L. (2004) In, about and For: Exploring the foundation of environmental education, set 2, 15-18

- Barrett, (2005) Understanding the Importance of Environmental Education: An Examination of I Love A Clean San Diego, a Local Environmental Nonprofit
- Battersby, J. (1999) "Does environmental education have street credibility and the potential to reduce pupil disaffection within and beyond their school curriculum?" *Cambridge Journal of Education*, 29/3, 1999: 447-457.
- Beach, D.M. and Reinhertz, J.N. (2000) Supervisory leadership: focus on instruction, London. Allyn and Balon printers.
- Benedict, F. (1999) A Systemic approach to sustainable environmental education.
- Bojana B. (1994) Education and Social Policy Department the World Bank. Environmental issues in Secondary School Education. Discussion paper series No. 21.
- Bolstad, R., Eames, C., Cowie, B., Edwards, R. and Rogers, N. (2004) Environmental education in New Zealand schools: Research into current practice and future possibilities. Volume 4. Case studies of environmental education practice in eight schools and Kurakaupapa Maori. Wellington: New Zealand Council for Educational Research and University of Waikato.
- Borg, R.W. and Gall, P.G. (1996) Educational Research. An introduction. New York: Longman Publishers Ltd.
- Brown, L. (2003) Priorities for environmental education: What supports do secondary school teachers need to implement education for the environment?. Unpublished Master's thesis: Griffith University. *Cambridge Journal of Education*, Vol. 29, Issue 3.
- Carly, A. (2007) How we learn about climate change; Environmental Education. Chapel Hill, North Carolina.
- Chaineux, Marie-Claire P.S.G., Charlier, Roger H (1999) Strategies in environmental education. *International Journal of Environmental Studies: Sections A & B*, Vol. 56, Issue 6.
- Cheal, J.C., (1962) Educational Administration: The Role of the teacher. Toronto: Commissioned by the Environment Directorate-General of the European Commission Conference on Hunger and Poverty-Vision Statement (2007) *International Fund for Agricultural Development*. Retrieved from the web October 12, 2009. <http://www.ifad.org/events/past/hunger/vision.html>.

- De Lorme, Denise E., Hagen Scott C. and Stout I. J. (2003) Consumer's perspectives on water issues: Directions for educational campaigns. *The Journal of Environmental Education*, Vol. 34, N° 2, 28-35.
- Eames, C. and Cowie, B. (2004) Environmental education in New Zealand schools: Characteristics and achievements set, 2, 19-24.
- Engleson, D.C. and Yorkers, D.H. (1994) A Guide to Curriculum Planning in Environmental - E. practice in New Zealand schools". *Environmental Education Research*, 14/1: 35-51. Environmental Education. Madison. WI. Wisconsin Department of Public Instruction.
- Fien, J. (2002) Advancing Sustainability in Higher Education. *International Journal of Sustainability in Higher Education*, 3(3), 243-253.
- Fien, J. P. Kumar and Ravindranath M. J. (2001) "An action research network as a strategy for educational change: the 'learning for a sustainable environment' Project". *Journal of educational change*, 2, 2001: 207-221.
- Filho, et. al., Walter Leal, Bandeira, Monica Villa (1995) Media and environmental education. *Convergence*, Vol.28, Issue 4.
- Graber, R.K.; Robottom I. (1999) "The OECD-ENSI project and its relevance for teacher training concepts in environmental education". *Environmental Education Research*, 5/3, 1999: 273-291.
- Green Cross International website, 2004 www.greencrossinternational.net/
- Hansmann, R. (2009) Linking the Components of a University Program to the Qualification Profile of Graduates: The Case of a Sustainability-Oriented Environmental Science Curriculum. *Journal of Research in Science Teaching*, 46(5), 537-569.
- Hassan. A. Juahir, H, Jamaludin, N.S, (2009) The Level of Environmental Awareness among Students to Fulfill the Aspiration of National Philosophy of Education.
- Hotinli, G. (2004) Environmental Education in Turkey. DLM.MIO-ECSDE. The status of Environmental Education in the Mediterranean countries within the formal and non formal Education systems. Dec., Issues: 34.
- Hungerford, H, Peyton, R.B. and Wilke, R. (1980) Goals for Curriculum Development in Environmental Education. *Journal of Environmental Education*. Volume 11 Number 3. Sum Publishing.

- Jackson T. (2005) Motivating Sustainable Consumption: A Review of Evidence on Consumer Behavior and Behavior Change. *Guidford, sustainable development research network 291-08 (14)*.
- Jones, P.C.Q. Merritt (1999) "The TALESSI Project: Promoting active learning for interdisciplinary, values awareness and critical thinking in environmental higher education". *Journal of Geography in Higher Education*, 23/3, 1999: 335-348.
- Kaya, E and Gökçe N. (2010) Cultural International Journal of Philosophy of Culture and Axiology, vol. VII, no. 2.
- Keating, M. (1993) The Earth Summit Agenda for Change. Retrieved from the web January 21, 2010. <http://www.iisd.org/rio+5/agenda/default.html>.
- KICD, (1992) Secondary Education Syllabus. Volume 2 Nairobi.
- KICD, (1997) Environmental Education source book for Primary Teacher Education in Kenya. Nairobi.
- KICD, (2002) Secondary Education Syllabus. Volume 1. Nairobi.
- KICD. (2002) Secondary Education Syllabus Volume 6. Nairobi.
- Kochhap, S.K. (1988) Secondary School Administration. New Delhi:
- Kralj, D. (2010) Education for Sustainable Management. *International Journal of Education and Information Technologies* Issue 3, Volume 4.
- Laird, J. (2000) Money Politics, Globalization and Crisis: The Case of Thailand. Graham Brash Pte Ltd. 144 Upper Bukit Timah, Singapore. Macmillan.
- Madduma B. C. M. (1989) Environmental awareness among the most vulnerable communities in developing countries. *International Social Science Journal*, Vol. 41 Issue 3, p441.
- McLean, T. (2003) Environmental education in Otago primary schools. Education for the environment. Set: Research information for teachers, 1, 4-9.
- Megalos, M. A. (1996) School yard environmental projects: a planning primer, 19 Retrieved from <http://www.ebscohost.com/login.aspx> .
- Mgimwa, C. and Marie. (2011) Club Environment and School Governance in Secondary Schools field work study from Morogoro and Pwani, Tanzania. *The journal of experiential Education*, 2011(8), 13-17.

- Ministry of Education. (1987) A manual for Heads of Secondary Schools in Kenya, Nairobi: Government Press.
- Monk, Lee H. (1991) The resource of public broadcasting. *EPA Journal*, Vol.17, Issue 4.
- Morakinyo, A. (2003) Relative efficacy of systematic desensitization, self statement monitoring and flooding on students test anxiety. Unpublished PhD. Thesis. University of Ibadan.
- Moroye, C.M. (2005) Common ground: an ecological perspective on teaching and learning, *curriculum and teaching dialogue* 7(1/2): 123-129.
- Mugenda, O.M. and Mugenda, G.A. (2003) Research methods: Quantitative and Qualitative Approaches. Nairobi; Action press.
- Murford, B. (2003) School Leaders: Changing Roles and Impact on Teacher and School Effectiveness. A paper commissioned by the Education and Training Policy Division, OECD, for the Activity Attracting, Developing and Retaining Effective Teachers
- O'zden, M. (2008) "Environmental Awareness and Attitudes of Student Teachers: An Empirical Research", *International Research in Geographical and Environmental Education*, 17:1.
- O'Hearn, G.T. O. (1975) The Environment and Education. *Fastback*, 52.
- OECD. (2001) Report on Hungary/OECD seminar on Managing Education for Lifelong Learning, 6-7 December 2001, Budapest.
- Ojo, L.B and Olaniyan, D.A. (2008) Leadership Roles of School Administrators and Challenges Ahead in Post-Primary Institutions in Nigeria, *European Journal of Scientific Research* Vol.24 No.2, pp.172-178.
- Ombech, A.N, (1991) Teaching Enviromental Education. in Otiende, J.E., Ezaza, W.P and Boisverts, R. (Eds) An introduction to Environmental Education, Nairobi, Nairobi University Press.
- Ominde, S.H., (1988) Kenya's Population growth and development to the year 2000. Nairobi; Heinemann Kenya.
- Orodho, J.A (1996). Factors Determining Achievements in science subject at secondary level in Kenya. Doctorial thesis Kenyatta University.

- Orodho, J.A., (2005) *Techniques of Writing Research Proposal and Reports*, Nairobi: Kanezja, HP Enterprises.
- Osaki, K.M. (1995, December). Environmental Education as an Interdisciplinary subject Paper presented at the EE workshop at Morogoro. Tanzania.
- Otiende, J.E, (1991) *An Introduction to Environmental Education* Nairobi; Nairobi University.
- Pace, P. (1997) Environmental education in Malta: Trends and Challenges. *Environmental Education Research*, Vol. 3, Issue 1.
- Pandey, V.C. (2006) *Environmental Education*: Mehra offset press, Delhi.
- Perikleous, (2004) The status of Environmental Education in Cyprus today. DLM. MIO-ECSDE.
- Pettus, A. and Schwab; (1979) A survey of Virginia Public School Principals on the state of Environmental Education. *Education journal on Environmental Education*.
- Pruneau, D.A. Doyon, J. Langis, L. Vasseur, G. Martin, E. Ouellet and G. Boudreau. (2006) "The process of change experimented by teachers and students when voluntarily trying environmental behaviours". *Applied Environmental Education and Communication*, 5, 2006: 33-40.
- Saiduddin, J. (2003) *Factors Affecting Achievement at Junior High School on the Pine Ridge Reservation*. Spain: Ohio State University.
- Sarkar, M. (2011) Secondary Students Environmental Attitude: The case of Environmental Education in Bangladesh. *International journal of Academic Research in Business and social Sciences August (2011)*, Vol. 1, 2222-6990.
- Schultz, P.W., Oskamp.S., and Mainieri, T. (2005) Values and their relationship to Environmental concern and conservation behaviour. *J. Cross cultural psycho*. 36: 457-475.
- Shah, A. E. Treby. (2006) "Using a community based project to link teaching and research: the bourne stream partnership". *Journal of Geography in Education*, 30/1, 2006: 33-48.
- Shiyakumar, G. (2011) Environmental Attitude among the Secondary School Students. *Indian Streams Research Journal Vol.1, 11pp.1-4*.

- Shobeiri, S., (2005) A Comparative Study of Environmental Awareness and Attitude of Teachers and Students of Secondary Schools in India and Iran, PhD Thesis, department of education, University of Mysore, India.
- Smyth, J. C. (1995) Environment and education: a view of changing scene. *Environmental Education Research*, 13504622, Vol. 1, Issue 1
- Sobel, D. (1995) Beyond ecophobia; reclaiming the heart in nature education. *Orion*, Vol.14, No 4.
- Stapp, B.W. (1969) The Concept of Environmental Education. *Journal of Environmental Education*. Volume 1 Number 1. Sum Publishing. Sterling Publishers.
- Stokes E. Edge (2001) A and Anne West Centre for Educational Research, Environmental education in the educational systems of the European Union, Synthesis report,
- Tabucanon, M. (1998) *Environment: Thailand's Experience* (Paper presented at the International Workshop on —Environmental Awareness□ by Department of Environmental Quality Promotion, Ministry of Science, Technology and Environment, Thailand).
- Taethiengtam, A. (2000) Impact of Population on Environmental Change in Thailand (Doctoral Dissertation, The National Institute of Development Administration, NIDA, 2000).
- Toili, W.W. (2007) Secondary School Students' Participation in Environmental Action: Coercion or Dynamism? *Eurasia Journal of Mathematics, Science & Technology Education*, 2007, 3(1), 51-69
- Tuckman, B.W. (1972) *Conducting Educational Research*. Second Edition, USA, Harcourt Brace Juronivich Inc.
- Tunku, K. T. F. (2006) Environmental Education awareness. IMPAK. Issue: 4, DOE Malaysia.
- UNEP, (2007) *Public Environmental Awareness and Education*. <http://www.unep.org/dec/onlinemanual/Enforcement/InstitutionalFrameworks/PublicAwarenessEducation/tabid/99/Default.aspx?page=1> [Accessed 26 August 2007]
- UNEP, (2012) 21 Issues for the 21st Century: Result of the UNEP Foresight Process on Emerging Environmental Issues. United Nations Environment Programme (UNEP), Nairobi, Kenya.
- UNESCO, (1999) Environmental Education and Training in Egypt, *UNESCO*, Paris.

- UNESCO, (1997) Final Report. Tbilisi-Paper Presented at the Intergovernmental. Conference on Environmental Education. Tbilisi, Republic of Georgia.
- UNESCO, (2012) 21 Issues for the 21st century: Result of the UNEP Foresight process on emerging Environmental Issues. United Nations Environment Programme, (UNEP), Nairobi, Kenya.
- UNESCO, (2012) Education policy matters. UNESCO, Bangkok.
- UNESCO-UNEP, (1978) The Tbilisi Declaration; final report. Intergovernmental conference on Environmental conference on Environmental Education organized by UNESCO in cooperation with UNEP. Paris
- UNESCO-UNEP, (1985) IEEP series 9 UNEP, Nairobi.
- UNESCO-UNEP. (1986) Guidelines for the development of non-formal Environmental Education. Environmental Education series 23, Gwent College of higher education by A.J. Young M.J. McElhone.
- United Nations Decade of Education for Sustainable Development (2005-2014) Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability, Education for Sustainable Development in Action, Technical Paper N° 2 - 2005 UNESCO Education Sector.
- United Nations, (1994) United Nations Conference on Environment and Development Rio de Janeiro: Agenda 21, Rio Declaration, Forest Principles (Drafts), UN: Brazil.
- United Nations. (1987) Report of the World Commission on Environment and Development, General Assembly Resolution 42/187, 11 December 1987. Retrieved: 2012-11-14
- Vaughan, C; Gack, Julie; Solorazano, Humberto; Ray, Robert (2003) The Effect of Environmental Education on Schoolchildren, Their Parents, and Community Members: A Study of Intergenerational and Intercommunity Learning. *Journal of Environmental Education*, Vol. 34, Issue 3, p12.
- Wood, D.J. (1991). Co-operate social performance. London. University of Pittsburgh.
- Wood, Denis (1994) Memory, love, distortion, and power: what is a map? *Orion*, Vol. 3, No 2.
- Woodgate G. (2010) Introduction. In *The International Handbook of Environmental Sociology*, 2nd edn, Redclift MR, Woodgate GR (eds). Elgar: Cheltenham; 1–8.
- Woodgate, G. (2012) What are the most important Environmental problems according to the second grade primary students? *Procedia soc. Behav. Sci*, 2: 1605-1609.

www.gci.ch/GreenCrossPrograms/environmentaledu/eeconcept.html.

Xue, X.; H. Hong, L. Zhang, X. Xu and S. S. Shen (2006) "Developing public environmental education: improving community-based environmental management". *Aquatic Ecosystem Health and Management*, 9, 2006: 105–110

Yurttta, F. Sülün, Y. (2010). What are the Most Important Environmental Problems According to the Second Grade Primary School Students? *Procedia Soc. Behav. Sci., Vol 2: 1605-1609*

APPENDICES

Appendix 1: Questionnaire for Teaching Staff

Dear respondent,

The researcher is a postgraduate student (MSC) at Kenyatta University Kinyi Emily Irene Njeri (N50/CE/14490/2009) in the Department of Environmental Education undertaking a study on the FACTORS INFLUENCING AWARENESS AND PARTICIPATION IN ENVIRONMENTAL EDUCATION ACTIVITIES IN SECONDARY SCHOOLS: A CASE OF DAGORETTI WEST SUB-COUNTY, KENYA.

The questions in this questionnaire are for research purpose only and the finding of this study was treated with utmost confidentiality.

Your assistance in answering the questions truthfully and accurately was highly appreciated.

GENERAL INFORMATION

A. Name.....

B. Schools' name.....

C. Position in the school

1=Principal

2=Deputy Principal

3=Head of department

4=Class teacher

5=Club patron

D Gender

1=Male

2=Female

E. Age

18-27

28-37

38-47

48-57

58 and above

F. Number of teaching years

G. The highest level of Education Achieved (tick the correct one)

- 1. Post graduate (Masters and PhD)
- 2. Degree
- 3. Post graduate diploma
- 4. Diploma
- 5. Certificate

H. Type of school

- 1=Mixed school
- 2= Boys only
- 3= Girls only

I. Are you involved in Environmental Club?

- 1=Yes
- 2=No

J. Have you in the last five years participated in any environmental activity?

- 1=Yes
- 2=No

SECTION B

2. Which among the following administrative roles have you been involved in? Answer the questions where (1=Too often, 2=Often and 3=Less often)

	Roles of administrators in environmental education	1	2	3
A	How often have you been involved in Planning for environmental activities in your school?			
B	How often have you actively participated in organizing environmental activities in your school?			
C	How often have you been involved in directing resources toward environmental conservation?			
D	How often have you been involved in staffing regarding the environmental awareness?			
E	How often have you been involved in controlling the resources toward			

environmental awareness in your school?			
-----------------------------------------	--	--	--

SECTION C

3. (a) Does your school have enough resources to teach environmental education?

1=Yes

2=No

3 (b) What is the level of understanding on below listed environmental aspects? (Tick (✓) the appropriate competence)

Environmental aspects	Low← Awareness →High				
	1	2	3	4	5
Air pollution					
Water pollution					
Waste management and disposal					
Land pollution					
Climate change					
Effects of global warming					
Effects of Ozone layer depletion					
Impacts of deforestation					

Codes for awareness

1=Not aware

2=A little aware

3=moderately aware

4=fairly aware

5=Very aware

4) Which is the most appropriate means of enhancing environmental education in public secondary schools? Tick (✓) where appropriate

Ways of enhancing environmental education	
Creating awareness	
Training	
Giving incentives	
Initiation of action plans	
Budgetary allocation for EE activities	

5) Environmental activities carried out in schools (projects undertaken) as a result of awareness

Environmental activities	Low← →High Importance				
	1	2	3	4	5
Water resource management					
Forest cover education					
Tree planting					
Environmental public awareness creation					
Plastic waste management					
Establishment of environmental awareness campaign					
Use of environmental friendly resources					
Environmental communication					

6) How do you enhance environmental education in schools?

- a) Training
- b) Awareness creation
- c) Giving incentives
- d) Initiation of action plans
- e) Budgetary allocation for environmental education

Appendix 2: Questionnaires for Secondary School Students

Dear respondent,

The researcher is a postgraduate student (MSC) at Kenyatta University Kinyi Emily Irene Njeri (N50/CE/14490/2009) in the Department of Environmental Education undertaking a study on the FACTORS INFLUENCING AWARENESS AND PARTICIPATION IN ENVIRONMENTAL EDUCATION ACTIVITIES IN SECONDARY SCHOOLS: A CASE OF DAGORETTI WEST SUB-COUNTY, KENYA

The questions in this questionnaire are for research purpose only and the findings of this study was treated with utmost confidentiality.

Your assistance in answering the questions truthfully and accurately was highly appreciated.

SECTION A

1. BACKGROUND INFORMATION

A. Gender of the respondents

1=Male

2= Female

B. Position of the students

Head student

Duty prefect

Monitor

Club chair

Ordinary student

C. Class (form)

D. Do you belong to Environmental club in your school?

1=Yes

2=No

E. Have you ever been exposed to environmental education in any subject in school?

1=Yes

2=No

F. Other than school, what other sources do you get information on environmental education?

1. Internet

2. Television

3. Newspapers

4. Radio

5. Municipal library

G. Education level of parents/guardians

(Tick where applicable)

1=no education

2=primary education

3=secondary education

4=tertiary education

H. Occupation of the parents/guardian

(Tick where applicable)

1=Farming

2=Business

3=Employed

I. Type of the family (Tick where applicable)

1=Nuclear (both parents/guardian)

2=single family (one of the parents/guardian)

J. Family size 1, 2, 3, 4, 5, 6, 7, more than 7.

SECTION B

2. What is the level of understanding on below listed environmental aspects? (Tick✓ the appropriate competence)

Environmental aspects	Low←→High				
	Awareness				
Air pollution	1	2	3	4	5
Water pollution					
Waste management and disposal					
Land pollution					
Climate change					
Effects of global warming					

Effects of Ozone layer depletion					
Impacts of deforestation					

Codes for awareness

1=Not aware

2=A little aware

3=Moderately aware

4=Fairly aware

5=Very aware

SECTION C

3. Students Perception towards the Environment

i. I am in favour of having a clean school compound, even if few students ever get a chance to clean the compound

1. Strongly disagree

2. Disagree

3. Neutral

4. Agree

5. Strongly agree

ii. Government should pass a Law to have environmental education taught as a subject in the school curriculum.

1. Strongly disagree

2. Disagree

3. Neutral

4. Agree

5. Strongly agree

iii. I am interested in spending time working to help the environment in and out of the school even though I realize this will cut into my free time.

1. Strongly disagree

2. Disagree

3. Neutral

4. Agree

5. Strongly agree

iv. If everybody were a member of environmental related clubs, our school compound would look more clean and beautiful.

1. Strongly disagree

2. Disagree

3. Neutral

4. Agree

5. Strongly agree

v. How far do you trust environmental education to resolve environmental problems in your school compound?

1. Completely distrust

2. Somewhat distrust

3. Neither trust nor distrust

4. Somewhat trust

5. Completely trust

vi. How far do you trust environmental education to resolve environmental problems in Dagoretti district?

1. Completely distrust

2. Somewhat distrust

3. Neither trust nor distrust

4. Somewhat trust

5. Completely trust

vii. If every classroom has a dustbin, our school would look much tidier.

1. Strongly disagree

2. Disagree

3. Neutral

4. Agree

5. Strongly agree

viii. Plastics is the major problem in our school and the government should do something about it probably ban its use. .

- 1. Strongly disagree
- 2. Disagree
- 3. Neutral
- 4. Agree
- 5. Strongly agree

ix. Do you think environmental education is relevant to students?

1=Yes

2=No