EVALUATION OF THE EFFECTIVENESS OF PRE-SCHOOL CURRICULUM IN ROMOTING ENVIRONMENTAL CONSERVATION AND SUSTAINABILITY ETHICS IN KIAMBAA DISTRICT, KENYA

By

EUNICE NGENDO MIRINGU

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DECLARATION

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

Eunice Ngendo Miringu

This thesis has been submitted for examination with our approval as University supervisors

Dr. Origa Japheth G.O.

Lecturer

Department of Educational Communication and Technology

University of Nairobi

Dr. Jane C. Gatumu

Lecturer

Department of Educational Communication and Technology

University of Nairobi

DEDICATION

I dedicate this work to my grandson Elvis Ngugi. May the study inspire you to be diligent in everything that you do in your life through God's will.

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ABBREVIATIONS AND ACRONYMS

ARCPS: Action Research and Community Problem-Solving

DICECE: District Centre for Early Childhood Education

ECDC: Early Childhood Development Centre

ECDE: Early Childhood Development and Education

ECEE: Early Childhood Environmental Education

ECE: Early Childhood Education

ECD: Early Childhood Development

E.E: Environmental Education

EMCA: Environmental Management and Coordination Act.

IPCC: Inter-governmental Panel on Climate Change.

KIE: Kenya Institute of Education

MDGs: Millennium Development Goals

MEAs: Multilateral Environmental Agreements

NACECE: National Centre for Early Childhood Education

NEMA: National Environmental Management Authority

NEPAD: New Partnership for Africa's Development

TEEB: The Economics of Ecosystems and Biodiversity.

UNCCD: United Nations Convention to Combat Desertification.

UNESCO: United Nations Education Science and Cultural Organization

UNEP: United Nations Environmental Programme.

UNFCCC: United Nations Framework Convention on Climate Change.

WHO: World Health Organization

WMO: World Meteorological Organization

ABSTRACT

Degradation of the environment caused by unsustainable use of resources is a global concern. Environmental education is a vital tool in the development of enlightened opinion and responsible actions towards the environment. Evaluation of the effectiveness of early childhood education curriculum in promoting environmental conservation and sustainability ethics in pre-school children is therefore very crucial. The concern is whether the curriculum has an impact on the behavior of children regarding concern and respect for the environment since they are the adults of tomorrow. The study is based on the premise that early childhood years are important for grounding important values, attitudes, and beliefs. The research was a case study using *ex post facto* design. It was an in-depth investigation of a group of pre-school children in Kiambaa District in Kenya. The factors that may have led to their environmental conservation and sustainability ethics were determined retrospectively. The population in the study included pre-schools in Kiambaa District, pre-school children, teachers, managers of the pre-schools and parents. ECE curriculum developers were also included. The instruments included interview schedules for teachers and children, questionnaires for parents, teachers and curriculum developers, observation schedule for the children and documentary analysis schedule. Questionnaires were hand delivered and self administered while interviews were on a face to face basis. Observations were done in the pre-schools and in addition documents were examined. Data was analyzed qualitatively and quantitatively then presented in form of tables and charts with percentages of the responses. Some of the data was presented in a narrative manner. The research findings indicated that the content of EE is not explicitly stated in the ECE curriculum guidelines. Methods and activities suggested in the syllabus seem not to cover environmental conservation and sustainability. Moreover, teachers are not innovative enough to incorporate environmental conservation activities in the learning process. Similarly, the examination oriented culture of the current education system is not heuristic. Teachers use lecture method while project work and educational visits are viewed as waste of time. Low level of responsiveness towards environmental conservation was observed in many children. It was evident that many did not have knowledge about conservation and therefore lacked moral sense regarding conservation of environment. Practice at school and home reflected lack of involvement in conservation activities. In addition, parental involvement seemed to contribute to lack of consistency in guiding the children. Similarly, failure to involve children in local environmental conservation activities appears to deny them a chance to understand their responsibility as members of the community. In concluding, the ECE curriculum was found to be ineffective in promoting conservation and sustainability ethics in the children. This was indicated by low level of responsiveness and moral sense regarding conservation as well as lack of positive attitude towards conservation activities. The recommendations made subsequent to the conclusions include the need for curriculum developers to review the current ECE curriculum in order to include concepts of environmental conservation and sustainability. The Ministry of Education should ensure proper training of teachers on matters of environmental conservation. The MOE should also assist pre-schools with an activity schedule for conservation activities or consider having EE as a separate unit in teacher training and ECE. Moreover, children should be included in local environmental conservation activities. Suggestions for other research studies include a large scale study on the ECE curriculum, a study on conservation activities schedule for pre-school and a survey on opinion regarding involvement of children in local environmental issues.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Problem

Environmental sustainability is one of the eight Millennium Development Goals (MDGs) endorsed by world leaders in 2000 (United Nations Environmental Programme (UNEP), 2006). As stated in UNEP (2006), the UN Millennium project views this goal as important in laying the foundation on which all the other (MDGs) can be built. Environmental conservation and sustainability ethics must be inculcated in the young children who are the adults of tomorrow. According to cognitive theorists, children's ability to evaluate moral action is related to the child's relationship to adult authority (Bennaars, 1993). Developmental psychologists Piaget, (1932) and Kohlberg, 1976 cited in Bennaars, (1993) have emphasized cognition or knowing as the determinant of moral judgment and understanding. According to Damon (1988) cited in Santrock (1998), moral education occurs through social interactions at home and school. Social constructivists suggest that learning is a joint venture between the teacher/caregiver and the learner (Vygotsky, 1978). They emphasize that social encounters/interactions are key to creation of meaning and understanding. The early years are the most significant in an individual's life (United Nations Education Science and Cultural Organization (UNESCO), 2008). They are the most favourable for developing the desirable attitudes and values which are the basis for an individual's personality. Parents and other caregivers are the earliest socializing agents and are a determining influence on an individual's development (Baumrind, 1978) cited in Ambron, (1982). The UNESCO report continues to state that the values and attitudes acquired early in life determine the ethnical and moral behaviors throughout life. This in turn influences the decisions and choices a person makes in life (UNESCO, 2008).

In the world today, there is an outcry for people to start making appropriate decisions regarding the utilization of resources in the environment. The concern is that human beings are over-stretching the earth's support system (Stern, 2006). According to Fullan (2003), some of the environmental challenges are brought about by human activities. Examples of such human activities are deforestation, over cultivation, overgrazing and urbanization among others (UNEP, UNICEF & WHO, 2002). It is therefore imperative for the human kind to understand the extent to which the earth can support life (WHO, WMO & UNEP, 2003).

Man is part of a complex interrelated networking structure in which resources are shared (Capra, 1996; Harding, 2006). In the words of Capra and Harding, human activities have altered the stability of the soils, atmosphere, oceans, vegetation, animal life and water supplies. The earth has responded in form of drought, floods, temperature increase and violent weather (UNEP, 2006). Global warming has caused a rise in average sea level (UNEP 2006). According to UNEP, UNICEF and WHO (2002), unsustainable consumption patterns contribute to degradation of the environment. There is a reduction in crop yield as a result of climate change causing malnutrition and famine in some parts of the world (WHO, UNEP & WMO, 2003). Climate variability has also encouraged vectors of some infectious diseases like malaria (UNEP, UNICEF & WHO, 2000). According to the same report, cholera and other water borne diseases have become common as a result of intense flooding. At the same time sporadic rainfall has resulted to drying up of rivers and lakes. It has also been observed that skin cancers and eye cataracts have become common as a result of depletion of the ozone layer. As observed by Orr (1992), loss of some species and exhaustion of fossil fuels is alarming. Hurricanes like the one that swept

through the Gulf coast killing more than 1.000 people in 2005 are also becoming common (UNEP, 2006). At the same time, intensified draught especially in Africa and Asia are common phenomena (WHO, WMO & UNEP 2003). Young children must be given the necessary information about the causes of all these changes through environmental education.

Sub-Saharan Africa has fragile ecosystems of which nearly two thirds are dry land or desert according to World Development Report of 2010 (World Bank, 2009). According to the report, this feature makes Africa vulnerable to droughts and floods. Consequently, these natural deficiencies coupled with low levels of technological competencies have caused political instability over the years. According to this report, Africa's economies are highly dependent on natural resources. The report continues to state that nearly 80% of Africa's energy comes from biomass. A third of its gross domestic product comes from rain fed agriculture. This offers support to 70% of the population. World Development Report 2010: *Development and Climate change,* affirms that Africa's annual per-capita consumption is in danger of reducing by 4-5%. This will be as a consequence of sporadic rainfall and high temperatures. Stress is already being felt in critical areas like water supply as lakes and rivers are drying up. The report affirms that 20 African countries are today experiencing severe shortage of water. For example 80% of Lake Chad shared by Nigeria, Chad, Cameroon and Niger has dried up. Lake Victoria shared by the East African countries is also receding. It is projected that rainfall variability will increase undermining the survival of the existing crop variety.

Climate change is already affecting human health by altering the disease patterns. It has already been noted that there are more Malaria cases in the highland areas of

Rwanda (WHO, WMO & UNEP, 2003). According to UNEP (2006). the poorest countries have the greatest environmental challenges. This is because environmental degradation intensifies poverty and vise versa (UNEP, 2006). The effects of climate change are affecting the livelihoods of people especially in Kenya. There is need to ensure that people understand the need to exploit the natural resources in a sustainable manner. Informing the children about these challenges early enough is important for future generations.

Kenya is among forty-seven countries in sub-Saharan Africa that basically depend on their natural resources for development (Daily Nation Newspaper, 2009). In the views put forward in the Newspaper, the rate at which the natural resource base is deteriorating in the country is increasingly becoming unsustainable. The destruction of the water catchments' area in the Mau forest, Mt Kenya region and the Aberdares, through indiscriminate removal of vegetation cover is a worrying trend. The presence of forest cover decreases temperature fluctuations slows wind, increases humidity and reduces run offs (NEMA, 2009). According to NEMA Report, human encroachment has depleted 93,000 hectares of forest cover between 1932 and 2001. The same report states that this year alone, 76,000 hectares of Forest worth KSH 46 million have been lost. This has the effect of increasing surface flow of water when it rains increasing flooding down stream. It has also resulted to lack of humidity causing draught, and drying up of rivers hence lack of clean water. Kenya is facing a big challenge of hydro-electric power and wood biomass (NEMA, 2009). Crop production especially tea and coffee has decreased for lack of enough rain fall (Gathura, 2009).

According to NEMA (2009), the number of poor people in Kenya has been on the increase from 3.7 million in 1993 to 11.5 in 1994, 12.5 in 1997 and 17 million to date.

This is because they have been made vulnerable by climate change. NEMA reports that East and North Eastern provinces are hardest hit by draught as they rely on rain-fed agriculture. The report indicates that famine and malnutrition has affected children and elderly people. In the words of Rugene (2009), sections of central province have lost 80% of their water while western region has lost 30% resulting to poverty in the area.

According to Orr (1992), the effects of over-stretching the earth's support system have resulted to planetary emergency. Orr argues that this demands an educational urgent endeavor to create a new way of thinking. In the views of Orr (1992), it is important to ensure that people have the necessary knowledge and skills needed to safeguard the environment. Meadows (1974), suggests that environmental education within the formal curriculum is a practical response to the environmental problems the world is facing. The effectiveness of Environmental Education (EE) in promoting a new way of thinking must be ensured.

The role of EE in solving environmental crisis has been embraced by the international community (UNESCO, 1977). The UN Conference of 1972 in Stockholm declared Environmental Education as a vital tool in promoting a new standpoint. This new perspective is to guide patterns of behaviour and the choices that people make. This would guard the relationship between man and the environment (Cutter, 2001). The Tbilisi Intergovernmental Conference of 1977 on Environmental Education formulated specific objectives and principles on which Environmental Education curriculum is based (UNESCO, 1977). Agenda 21 of the UN Conference on Environment and Development (UNCED) 1992, the Earth's Summit held in Rio de Janeiro recognized the central role of Environmental Education. It emphasized the

need for social transformation, shaping of values and development of respect for all forms of life through Environmental Education. It also highlighted the strong connection between poverty and environmental degradation and the important role of Environmental Education in altering the state of affairs (Otieno, 2002).

Kenya has had Environmental Education infused into the formal education curriculum from 1985 (Otieno, 2002). Sessional paper number 6 of 1988 on Education and Manpower Training for the Next Decade and Beyond stated that "environmental studies be part and parcel of the education and training curriculum at all levels of education" (Republic of Kenya, 1988). Environmental issues have been defined and integrated in the curriculum in science activities, mathematics, and social studies (Republic of Kenya, 2008). Environmental education has also included training of primary school teachers since 1986. For the teacher trainers it has been an in-service course from 1985 (Otieno, 2002). Following the recommendations of Presidential Commission appointed in 1998, Environmental Education themes and messages were introduced in the curriculum at pre-primary and primary levels (Otieno, 2002). The goals of Environmental Education in Kenya are derived from the recommendations and guiding principles for environmental education at the Tbilisi Conference of 1977 (UNESCO, 1977). The following are the National goals for Environmental Education at the pre-primary and primary level as per the Kenya Institute of Education (Republic of Kenya, 2008)

i. To develop the children's appreciation and value for the environment in its totality.

ii. To enrich the children's experience by developing their imagination, creativity and thinking power, self-reliance, sensitivity to and therefore inquisitiveness or investigation into varied and diverse real world in which we live.

iii. To develop a children's consciousness for safety within the environment and thus acquire positive healthy attitudes and lifestyles.

iv. To promote understanding of the material environment and appreciation for its protection and utilization using scientific and technological knowledge and approaches such as problem solving.

v. To develop within the individual as a member of society good social habits, a sense of respect, co-operation and collective responsibility which are useful for harmonious co-existence.

vi. To strengthen the practical approach to Environmental Education in schools and establish networks for environmental conservation action between schools and the community.

The overall goal is to introduce comprehensive Environmental Education curriculum in all educational levels to enable all the users to assume responsibility and action towards sustainable use of the environment (UNESCO, 1977). The concern of the present study was to evaluate the effectiveness of the Early Childhood Education curriculum in promoting environmental conservation and sustainability ethics. The question was whether the curriculum objectives are being achieved or not.

1.2 Statement of the Problem

The role of Environmental Education is to ensure the development of respect and care for the natural environment in all human beings (Wilson, 1984). According to Fien (1993), the critical phase of early childhood years can determine the kind of values and attitudes children acquire towards the environment. Considering that environmental education has been integrated in the Early Childhood Education curriculum, environmental conservation activities should be evident in the pre-schools. The pre-school environment set-up should depict an awareness of

environmental conservation and sustainability. It has been noted that in many Early Childhood Development Centers (ECDCs). the environmental conditions are appalling despite the fact that Early Childhood education curriculum has integrated environmental education for many years. One would expect to see signs of tree planting, flower gardens, proper garbage disposal and water conservation among many other conservation activities. On the contrary, many pre-schools have classrooms that are littered with pieces of paper and polythene bags. The children do not seem to be adequately trained to respect their surrounding environment. Destruction of flowers and young trees is also evident in some ECDCs. Garbage collection and disposal, water conservation and environmental aesthetics are deficient in the ECDCs.

Many Early Childhood Education Centers have similar characteristics to the rest of the community. Environmental problems have been made worse by the fact that rainfall has been sporadic. Many rivers and natural springs have dried up so that people rely on dug up wells. Young children no longer enjoy nature in terms of flowing water and aquatic animals and plants. This situation in Kiambaa District of Kenya is not exceptional when compared to other Districts in the country. However, the district has undergone tremendous transformation due to mushrooming residential high-rise buildings. This has contributed to clearing of vegetation cover to provide space for the buildings. Exposure of top soil to the agents of erosion is very evident in many areas (NEMA, 2009). Further more, over-cultivation in the small patches of land remaining has also made the soils sterile. There seems to be some positive change especially regarding tree planting as observed by the District Forester. However, engagement of young children in environmental conservation activities is limited.

According to Reggio Emilio approach, the environment is "the third teacher" which means it should provide possibilities of exploration and discovery (Reggio Alliance, 2009). It emphasizes the need to encourage children to make their own observations, draw conclusions and take appropriate self directed actions. The concern of the researcher was to establish whether pre-school children in Kiambaa District Kenya are being offered the opportunity to explore, discover and take appropriate actions. The issue is whether the Thematic Integrated ECE curriculum is making an impact in the development of environmental conservation and sustainability ethics.

1.3 Purpose of the study

The purpose of this study was to evaluate the effectiveness of Early Childhood Education curriculum in the development of environmental conservation and sustainability ethics in pre-school children Kiambaa District Kenya.

1.4 Objectives of the study

The following are the specific objectives of the study;

i. To examine the impact of pedagogical practices employed by the teachers on children's responsiveness to environmental conservation issues.

ii. To establish the impact of the environmental conservation activities the school community is involved in on the actual conservation practices the children engage in outside the school time.

iii. To determine how the knowledge gained by the children concerning environmental conservation has affected their moral sense regarding the environment.

iv. To establish the influence of local environmental issues on the attitude of children towards conservation of environment.

1.5 Research questions

The following are the research questions that guided the study;

i. What is the impact of the methods employed by the teachers on the responsiveness of children towards environmental conservation issues?

ii. How does the choice of teaching/learning materials by the teachers influence the responsiveness of the children towards environmental issues?

iii. What is the impact of the environmental conservation activities that the school community is involved in on the actual conservation practices the children engage in outside the school time?

iv. How has the knowledge acquired by the children affected their moral sense regarding environmental conservation?

v. How does involvement in local environmental issues influence the attitudes of children towards conservation of the environment?

1.6 Significance of the study

Our society urgently needs a paradigm shift in matters concerning the environment. Environmental education is a major approach of changing the way people interact with the environment. Findings from this study may be useful in the following ways;

The Ministry of education would find the information useful for decision making and policy formulation regarding environmental education especially at pre-school level. The curriculum developers may find the information very useful as it highlights the strengths and weak points of the ECE curriculum regarding conservation and

sustainability of the environment. This may help in deciding on the concepts and messages to be emphasized regarding environmental conservation. In addition, guidelines to teachers may be made more explicit.

The teachers may also benefit a lot in terms of being sensitized to be more committed in teaching environmental education using proper methods. Consequently, they may develop positive attitudes and acquire values and beliefs that would make them better models to the children. In addition, they may be in a position to emphasize important concepts regarding conservation of the environment.

The children may benefit in that their teachers are likely to use better methods and provide better learning environments in terms of strategies, activities and materials. This may sensitize and help them acquire a different way of relating with the environment. Consequently, they may adapt lifestyles that would include guarding against environmental degradation in future.

1.7 Limitations of the Study

This research study used case-study research design. This means that generalization may be limited to pre-schools with similar characteristics as those in Kiambaa District Kenya.

There may be confounding variables such as influence of parents, peers and media on environmental conservation and sustainability ethics. The children may have acquired attitudes and values outside formal school curriculum. As a result, they may portray behaviour related to environmental conservation and sustainability ethics that the researcher may not be in a position to account for or control.

1.8 Delimitations of the study

The researcher limited this study to the pre-schools in Kiambaa District in Central Province, Kenya. The study focused on the pre-school children in the District. It also covered the parents of the pre-school children, their teachers and the managers of the pre-schools. It did not cover young children in classes one, two and three in cases where the ECDC was within a primary school. The research did not focus on the primary school teachers also.

1.9 Basic Assumptions of the Study

The study assumed that through formal environmental education, the child should acquire knowledge concerning conservation and sustainable use of the environment. It was assumed that the child develops respect, care and concern for the environment through participation in various conservation activities. This would mean that the child's way of thinking as well as values and attitudes towards the environment changes. The kind of choices the child would make around environmental issues is also changed.

1.10 Definition of key terms

Actual practices: Activities like proper usage of water, re-cycling of plastics, caring for small animals or watering of flowers and many others.

Attitudes: Feelings and related actions towards conservation of the environment.

Conservation: Maintaining the health of the natural world by preserving expected characteristics of the environment for future.

Conservation Activities: Things that people do to maintain a healthy environment like garbage collection, planting of trees or flowers and many others.

Effectiveness: The level of achievement of the intended purpose of environmental education in ECE in terms of responsiveness, moral sense, routine practice and the attitude towards conservation and sustainable use of the environment by the chidren.

Environment: Physical factors of the surroundings of human beings. This includes water, atmosphere, climate, sound, odour, taste, the biological factors of animals and plants, and the social factors of aesthetics, including the natural and the man made environment.

Environmental conservation: Actions/activities that ensure maintenance of the environment in good condition.

Environmental education: The process of acquiring values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings.

Environmental knowledge: The facts, skills and understanding that children gain by studying environmental issues like why littering, destruction of flowers or wastage of water is wrong.

Environmental sustainability ethics: Moral rules or principles of behavior for deciding what is right or wrong to do in order to maintain a healthy environment

Environmental sustainability: Present use of the environment or natural resource which does not compromise the ability to use the same by future generations or degrade the carrying capacity of the supporting ecosystem.

Ethics: Moral capacity to decide what is right or wrong to do for and in the environment

Evaluation: Systematic determination of the worth or significance of ECE curriculum in promoting environmental conservation and sustainability ethics.

Local environmental issues: Problems of garbage collection, conservation of water and soil as well as environmental aesthetics.

Moral Sense: Ability to understand right or wrong regarding the environment which may be reflected by concern, respect and sensibility to the environment.

Pedagogical practices: The instructional methods employed by the teachers in teaching about the environmental issues. This may include nature walk, project, exploration, discussions and many others.

Responsiveness: Readiness to react in a useful and helpful manner where environmental issues are concerned which may be reflected in terms of interest and involvement of children in conservation activities.

Sustainability: A pattern of using resources to meet the needs of human beings while preserving the environment for the future.

Sustainability ethics: A pattern of using resources in harmonious relationship between the human society and biospheric life support system which is enduring.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives a summary of the topics covered in the review of literature. The themes included in the reviewed literature are environmental degradation and its effects on human kind, environmental conservation ethics, the role of environmental education in Early Childhood Education, approaches of teaching environmental education, Environmental Education curriculum, and theoretical models for curriculum evaluation. Theoretical framework and conceptual framework are also included.

2.2 Environmental Degradation and its Effects on Human kind

The planet we are living in has limited and disproportionately distributed resources (Capra, 1996; Harding, 2006). Capra and Harding view the sharing of resources as an intricate interrelated web system in which man is included. A report by UNEP, UNICEF and WHO (2002), suggests that human activities have altered the balance of the soils, atmosphere, oceans, vegetation, animal life and water supplies. Climate change as a result of global warming is caused by human activities that introduce green house gases especially carbon dioxide into the atmosphere (UNEP, UNICEF & WHO 2002). Consequently, global surface temperature is expected to increase by 1.4 to 5.8 degrees from 1990 -2100. The consequence of this increase has been a rise in the global average sea level (UNEP, 2006). Scientists predict that continued global warming will cause sea levels to rise by between nine and 80 centimeters by 2100 (UNEP, UNICEF & WHO 2002).

At the same time, frequent and intensified draughts especially in Africa and Asia have become common phenomena (WHO, WMO & UNEP, 2003). On the other hand, some parts of Northern Hemisphere, precipitation has increased from 0.5 to 1.0 % per decade. Natural disasters, from flooding, to draughts, torrential rains, ice storms, tornadoes and hurricanes are common. For example in 2005, hurricanes swept through the Gulf coast killing more than 1,000 people (UNEP, 2006). This is a clear indication that repercussions of global warming are with us today (UNEP, 2006). Global warming grew to a high enough level by 1980s for the World's governments to become concerned (Drake, 2000). This led to the formation of Intergovernmental Panel on Climate Change (IPCC) in 1988. The Panel was set to assess scientific information and to come up with strategies to combat the problem. Carbon dioxide was found to be the most important contributor of global warming as compared to the other gases (Drake, 2000). It is also clear that combustion of carbon fuels is the most important source of carbon dioxide.

An IPCC report confirms that capturing and storing carbon dioxide from power plants and factories instead of releasing it to the atmosphere could play a major role in minimizing climate change (UNEP, 2006). According to IUCN (2009), the economics of Ecosystems and Biodiversity (TEEB) has researched on the "use of ecosystems to fight climate change". The study report affirms that 15% of the world's carbon dioxide emissions are absorbed by forests every year. TEEB suggests that investing in ecosystem–based measures like reforestation could assist in combating climate change. A forest-carbon finance package has been suggested by TEEB to pave the way to Green Economy in the 21st century. As a result, UNEP and World Bank started the Carbon finance for Sustainable Energy in Africa initiative (UNEP, 2006).

Other effects of higher temperatures, heavier rainfall and changes in climate variability are multiplication and expansion of vectors of some infectious diseases to new geographical regions (UNEP, UNICEF & WHO, 2000). Some of these diseases include Malaria, Schistosomiasis, Dengue fever, Yellow fever and encephalitis. It is estimated that the risk of diarrhea in 2030 will be higher by 10% if no improvement in climate will occur (WHO, WMO & UNEP, 2003). El Nino, which is a natural climatic phenomenon that causes intense flooding and draughts may happen more often. Excessive flooding is the prime cause of cholera and other water borne infections (UNEP, UNICEF & WHO, 2000). In Kenya, climate variability and extreme weather has caused increase in malaria epidemics especially in the highlands of western Kenya (NEMA, 2009).

The removal of trees decreases the ability of the soils to absorb and retain water. This results to depletion of ground water aquifers which are the sole source of water for many communities in the world. Millennium Ecosystem Assessment toolkit (2007) reports that water withdrawals have doubled over the last 40 years (IUCN, 2009). Many rivers are drying up as a result of destruction of water catchments' areas which offer climatic and water conservation benefits. According to UNEP, UNICEF & WHO (2002), deforestation is caused by the need to create agricultural land and to harvest fuel wood. Forests are also cleared in order to create room for development of new buildings in urban areas. Based on the report, more than 110 million hectares of forest disappeared in 1990s. About 45 percent of the word's original forests are gone (UNEP, UNICEF & WHO 2002). Removal of plant cover has increased soil erosion which leads to silting of lakes downstream. This causes degradation of water quality and disrupts the ecosystem (UNEP, 2006). Loss of biodiversity such as numerous species of fauna and flora occurs. This disrupts the purification of air and water. Both

plants and animal species have been disappearing 50-100 times the natural rate (UNEP, UNICEF & WHO, 2002). Forests are also a rich and important source of medicinal plants which should be preserved (UNEP, UNICEF & WHO, 2002). It is a matter of urgency that we humans realize the need to conserve the environment for our own good. It seems like there is lack of knowledge on how to engage in proper use of available land to exploit the natural resources in a sustainable manner. The present study was concerned about the contribution of the environmental education curriculum in helping the pre-school children to acquire the necessary knowledge and skills to exploit available resources in a sustainable way in future.

In Kenya, 90% of the population is engaged in agricultural activities in the rural areas (NEMA, 2009). However based on the report, 85% of the land is classified as marginal lands which are vulnerable to climatic variability. The original medium to high potential land is increasingly converting into arid and semi-arid lands (ASALS). In the view of UNEP, UNICEF and WHO (2002), desertification is partly caused by deforestation. Other human activities that cause desertification are unsuitable land use like over-cultivation, over-grazing, and poor irrigation practices. Apart from reduced food insecurity, other consequences of desertification include increased drought, increased flooding and aggravated health issues from air borne infections in wind-blown dust. More than 250 million people are directly affected by desertification (UNEP, UNICEF & WHO, 2002). Most of the affected are the world's poorest and marginalized citizens. In Kenya today, the pastoralist communities are in conflict with wildlife (NEMA, 2009). Based on the report by NEMA, there is competition for water and forage between domestic animals and wildlife. The decline in forage has brought about decrease in some animal species. Environmental education being a vital tool in shaping of behaviour towards the environment must be properly utilized.

Climate change has caused global concern leading to many international agreements supported by science (WHO, WMO & UNEP, 2003). The international body that provides coordination and leadership is the United Nations Environmental Programme (UNEP). The Mission of the United Nations Environmental Programme (UNEP) is to provide leadership and encourage partnership in caring for the environment. The role of environmental education in solving environmental crisis has been embraced by the international community (UNESCO, 1977). According to Kabeberi (1991), environmental education must be offered at all levels of education in the Kenyan society. An ethic of resource use which attempts to understand whether man has done what he ought to have done must be instilled in the people (Ogola *et al.*, 1997). The present study aimed at evaluating the effectiveness of early childhood education curriculum in instilling ethics of resource use in the young children in order to conserve the environment in future.

2.3 Environmental Conservation Ethics

Conservation ethics focuses on maintaining the health of the natural world. In the views of Ogutu (1996), human beings must live in harmony with nature. According to different religious traditions, man is just a steward of the earth (Katz, 1994) cited in Ogola *et al* (1997). Juddaism for example believes that nature is one of the realms in which humans interact with God. The Qur'an views degradation of the earth as a violation of the will of Allah as postulated by Timm (1994), cited in Ogola *et al* (1997). Hindu religious traditions, rituals and ceremonies depict a celebration of innumerable manifestations of nature. This has contributed to the conservation of trees, rivers, mountains and other natural features (Ogutu, 1996). Hinduism has a very useful conceptual resource that can be used to develop environmental ethics (Ogutu, 1996). In the view of Buddhists, nothing exists in isolation. Environmental

ethic must therefore be founded on the fact that the universe is a coherent whole (Brown, 1994 cited in Ogutu, 1996). In the words of Ogutu (1996), indigenous religious traditions have an elaborate ethical system for managing and protecting nature and culture. The ethical norms and values are entrenched in taboos and prohibitions that prevent extensive hunting and agricultural practices. This combination of culture and nature continued to work over many millennia but not any more (Rolston, 1994 cited in Ogutu, 1996).

A study on Deforestation and Decimation of Biota in Kericho District of Kenya by Kerich in 1990, affirms that people were attached to some animals and plants. Such animals and plants had traditional value. Major uses were mainly ceremonial and medicinal. According to Kerich (1990), some animals were considered family members and therefore all members of the family were prohibited from killing them hence conservation. Kerich (1990) suggests that conservation plans should be designed in harmony with people's perception. He recommends that indigenous trees and those that are of cultural value to people be planted. Based on Kerich's views, environmental education should be introduced at all levels of education as a multidisciplinary course.

Children today are the adults of the next generation (UNICEF, 2003). They should be helped to practice sustainable behavior from when they are very young. According to Mwikaba (1992) cited in Ogola (1997), human morals have been put to test by climate change. He suggests that a change has to start from the human soul. As suggested by Ogutu (1996), a new kind of responsibility for the earth can however be cultivated through the perspective of environmental ethics. The environmental ethics must be inculcated in the young children. They should be made aware of the

importance of preserving the elements of nature (UNICEF. 2003). Children need to be seen and heard in their communities because responsible citizenship does not just appear at 19 years (UNICEF, 2003). According to Hopkins (2007). to introduce new ways of thinking and a new lifestyle, we must begin with the young children's education. They must be helped to embrace the much needed world views of "Earth Stewardship" and the needs of present and future generations (Fien, 1993). The present study intended to evaluate the ECE curriculum to establish whether children are being helped to develop care, respect and concern towards the environment.

2.4 The Role of Early Childhood Environmental Education

Early childhood environmental education is important for the development of respect and care for the natural environment (Wilson, 1984). According to Fien (1993), the critical phase of early childhood years can determine the kind of values and attitudes formed towards the environment. A positive interaction with natural environment is an important part of healthy development. In the views of Wilson (1984), children who are close to nature tend to relate to it as a source of wonder, joy and awe. Nature has the capacity to nurture children's spirits and help them to discover sources of human sensibility (Wilson, 1984). Environmental education starts within the concrete environment of the child (Elstgeest& Harlen, 1990). There is a continuous interaction between the child and the environment. A child experiences the stinging nettle, the smell of hay, the shade under a tree, fallen leaves and many others (Elstgeest & Harlen 1990). Based on Elstgeest and Harlen views, this natural process of coming to terms with the world is the basis of environmental education. Children should be allowed to learn through discovery and self initiated activities. Teachers are only required to encourage and enrich the experiences by providing opportunities for investigation. They should also study aspects of their local environment which has

been affected by human activity (Knamiller *et al.*.1987). Environmental education should develop critical thinking, reflection and action skills (Fien, 1993). This will help in development of problem solving and decision making skills regarding the relationship between oneself, biosphere and other people (Fien, 1993).

According to research findings by Kanini (1996), involving integration of environmental education in secondary schools in Kenya, development of positive attitude towards conservation was correlated to involvement in conservation projects. Based on the views of Kanini (1996), such projects make the learners more enthusiastic about participating in conservation activities. Another related study on attitudes of primary school pupils towards environmental conservation activities was done by Mutinda (1991). Children in the slum were found to be ready and willing to participate in activities that would solve environmental problems within their community. Based on Mutinda's views, the children exhibited a lot of enthusiasm about participating in the activities. They showed a lot of appreciation of a clean environment (Mutinda, 1991). The present research intended to evaluate the involvement of children in projects within their community. The question was whether ECE curriculum is offering opportunities for children to get involved in conservation of the environment.

2.5 Approaches of Teaching Environmental Education

Action Research and Community Problem –Solving (ARCPS) model is the best approach to environmental education (Knamiller, 1987 in Baez *et al.*, 1987). The process should start with the teacher and the learners identifying a problem that may be affecting them. They should then discuss and explore ways and means of solving the problem. Knamiller continues to state that this is issue–based learning where the

content and skills are learned in light of real local environmental concerns. Such an approach motivates the children as they feel they are learning something that is useful (Wals & Stapp, 1989). The goals of ARCPS are to involve the learners in planning their own education. It also gives them the opportunity to apply acquired knowledge in improving the immediate environment that they themselves have identified. The approach also helps in developing skills needed in solving environmental issues (Wals & Stapp, 1989). Such skills include gathering, analyzing, synthesizing and interpreting information as well as working in groups. It allows the children to clarify norms and values as they evaluate a plan of action and make joint critical decisions (Wals & Stapp, 1989).

According to Reggio Emilia approach to Early Childhood Education, children are seen as being competent, resourceful, curious, imaginative, and possessing a desire to interact with and communicate with others (Reggio Alliance, 2009). According to the report, children participate in long term projects in which exploration and discovery are facilitated by the environment. The environment is viewed as the "third teacher". This means that teachers have to be very attentive to what the environment teaches the children. In Reggio Emilio approach, children get to participate in issues that require them to use critical thinking skills. Parents and teachers also collaborate with the children. This kind of collaboration forms a community of inquiry between the adults and the children. This is a fascinating way of handling environmental education with pre-school children.

A case study research was conducted at an early learning center at Brisbane (Australia) in 2004 (UNESCO 2008). Children of between $2^1/_2$ -5 years were involved. The children were involved in mini-projects which later became entrenched

in the every day practices of the center. After some time. the children were able to initiate their own projects on conservation. For example, a project centered on water conservation emerged from an observation that water was being wasted in the center. Through collaboration of children, parents and teachers, the children were able to organize the project. The children's knowledge of water issues developed from their discussions with their teachers. Their knowledge and interest turned into actions. They were able to monitor and minimize the usage of water in the center through warning signs mounted at different places. The report affirms that water consumption in the center significantly reduced. The children acquired water conservation routine which was transferred to their homes as reported by the parents. The center had several other projects for example one involving waste management. The children have been encouraged to carry litter-less lunches from home. This minimizes on the garbage to be collected from the center (UNESCO, 2008). The report affirms that the center has developed sustainability ethic entrenched in its culture. This is because projects are embedded into every day activities of the ECD centre (Campus Kindergarten, 2002). The researcher intended to find out whether the children in Kiambaa District are being involved in projects that would help them acquire environmental sustainability ethics. The concern was whether children are being involved in projects initiated by them or by the teachers in collaboration with the parents to help them develop concern and respect for the environment.

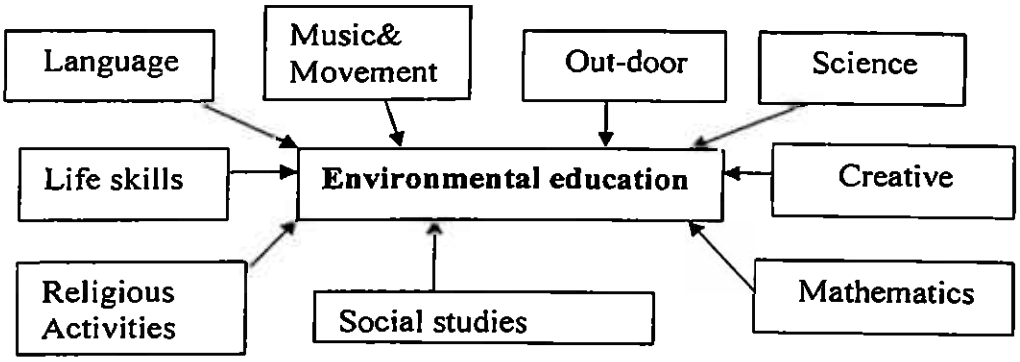
2.6 Environmental Education Curriculum

There are two common models in curriculum development for Environmental Education which are interdisciplinary and multidisciplinary (Muthoka, 1998). Interdisciplinary approach is created by drawing relevant components of many disciplines to create a course unit. Multidisciplinary approach on the other hand

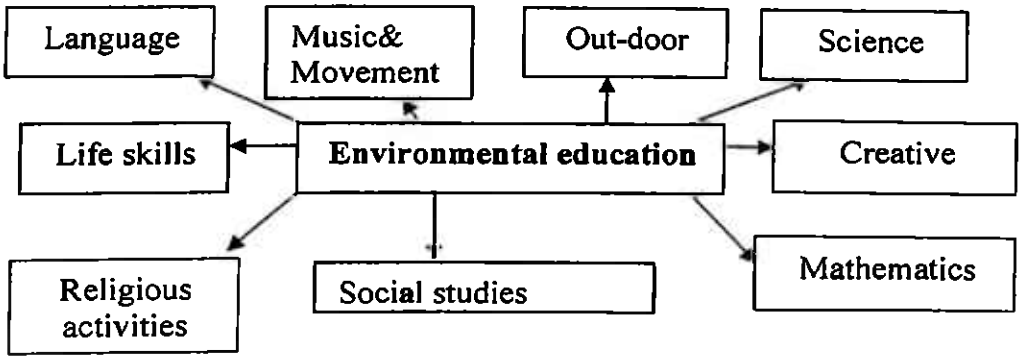
involves integration of concepts. skills and values of Environmental Education into relevant disciplines (UNESCO, 1986). The two approaches can be represented in the following ways;

Figure: 1 Approaches used in Environmental Education

a) Interdisciplinary Model



(b) Multidisciplinary Model



Source: UNESCO-UNEP 1986, EE series

Environmental problems arise from multifaceted activities of man on nature. This emphasizes the need to base Environmental Education on an interdisciplinary approach. In this approach, EE is linked with the existing school activity areas. Each activity area contributes to the realization of the objectives of EE (Korir, 1987).

Tbilisi conference of 1977 recommended this approach (UNESCO, 1978). However multidisciplinary approach which is a fused curriculum for EE is also applicable. This approach enables different subjects to use the environment as a resource. The environment is viewed as the "third teacher" according to Reggio Emilio (Reggio Alliance, 2009). This means that teachers have to be very attentive to what the environment teaches the children. In multidisciplinary approach, all the activity areas are linked through environmental education.

The ECE curriculum in Kenya has in fused environmental education in science and social activities, but a multidisciplinary approach is also in place. Nevertheless the environmental component is not clearly stated. On the other hand, a thematic integrated learning approach has been adopted. Themes are derived from things and situations that learners are likely to interact with every day. Each theme cuts across all the activity areas (Republic of Kenya, 2008). Teachers are encouraged to develop localized learning units to draw the attention of children to their own local environment (Knamiller *et al.*, 1987). They are also expected to be creative and incorporate environmental education concepts and messages in the activities (Ngumy, 2001). The present study intended to evaluate the approaches provided for by the curriculum and the manner in which teachers interpret them.

The ECE teacher education curriculum has not explicitly stated the content on environmental conservation. In science and social studies activities, interaction with the immediate environment is emphasized. Interrelationships within the environment as well as care for plants and animals have also been suggested. It seems like the teacher trainers have to be creative and innovative enough to bring on board issues of environmental degradation. A related study on implementation of Environmental

Education curriculum in primary teacher colleges indicates that techniques used for teaching are not effective (Kinyua, 2001). Based on the views of Kinyua, the tutors lacked innovative actions. The teacher trainers also had difficulties accessing teaching materials. This means that they could not prepare the teachers adequately. In the views of Kinyua, multidisciplinary approach is not effective in teaching environmental education. Duplication and fragmentation of content is seen as the major problem. Moreover, the objectives of environmental education are overshadowed by those of the core disciplines. The present study was concerned with early childhood education curriculum. The concern was whether the objectives of EE are being achieved through multidisciplinary as well as interdisciplinary approaches.

2.7 Theoretical Models on Curriculum Evaluation

The purpose of an evaluation is to find out if a given program is effective (Best & Kahn 1993). It is aimed at finding out what has happened during a given activity or in an institution. Evaluation adds the ingredient of value judgment to assessment according to desirability and effectiveness of a program. There are many models of evaluation which include context, input, process and product (CIPP) evaluation model, Tyler's goal oriented model, Goals-free model by Scriven, Provus model and many others.

CIPP model was developed by Stufflebeam as a means of linking evaluation with decision making (Stufflebeam, Madaus & Kellagan, 2009). CIPP model provides a systematic and holistic approach to evaluation. Based on Stufflebeam's views, CIPP model can be used in formative and summative way and therefore help to outline improvements as the programme progresses. This model is based on a cycle of planning, structuring, implementing, reviewing and revising decisions. Based on

Stufflebeam's theory, there are four aspects of CIPP model which help in decision making. Context evaluation determines what needs are addressed by a programme and defines objectives of a course. It also looks into the relevance and its relation to other courses. Input evaluation determines the available resources and alternative strategies to be considered. It considers content, resources, skills and knowledge of teachers as well as entering ability of learners among many others. Process evaluation assesses implementation of plans to help the teachers carry out activities as well as helping the users to judge programme performance. It deals with participation of learners, application of knowledge, institutional problems, and cooperation among stakeholders. Product evaluation identify and asses outcomes (intended and unintended). It is aimed at helping the staff in gauging the success of the programme in meeting the targeted needs.

Other models include Tyler's objectives model which establishes whether or not learners have achieved their goals (Tyler, 1950). It has had major influence upon evaluation theory and emphasizes the need to combine a variety of evaluation data. Such data can then be used as indicators to examine the extent to which educational objectives are being achieved (Finn, 1972). The nature of evaluation depends on the objectives being pursued and how each objective is defined (Taba, 1962). It also depends on the purpose for which the result of evaluation is used. Goals-free evaluation model by Scriven supplements in-built weaknesses in a goal-oriented approach (Scriven, 1993). Scriven suggests that the model provides unbiased perspective of the ongoing programme. Provus model of evaluation views evaluation as a continuous information management process (Provus 1971). It is designed to serve as a watch dog of programme management. Provus viewed evaluation as a process of agreeing upon standards, determining whether discrepancy exists between

the performance of the programme and the expected standards. Provus suggests that discrepancies should be used to decide on the best way forward.

In a related study by Kinyua (2001) on implementation of environmental education curriculum in primary school teacher's colleges, a combination of models was used. However, the present study will use CIPP model as it is holistic and it gives a clear picture providing better understanding of the context and processes at work.

2.8 Theoretical Framework

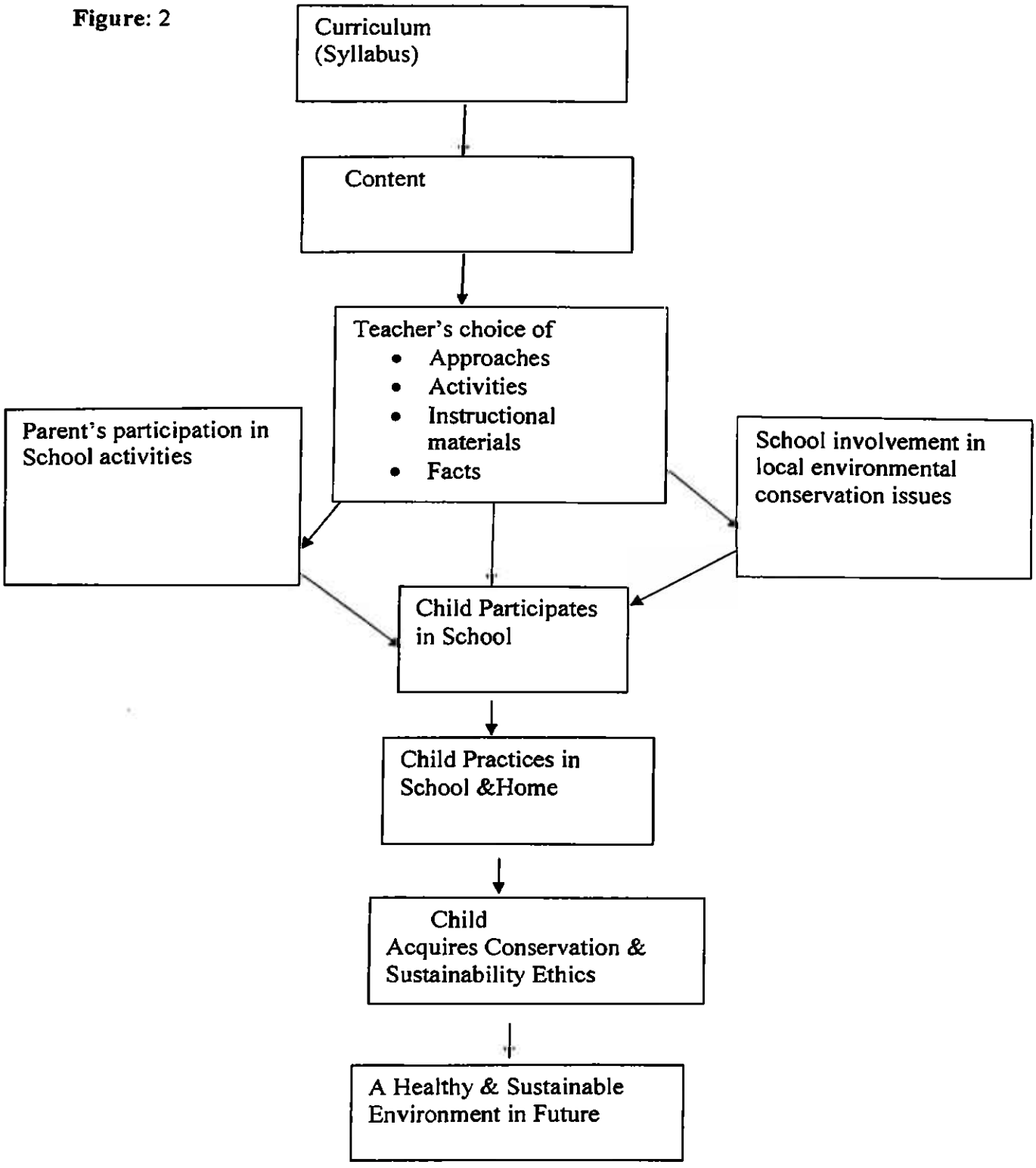
This study was informed by the theory of social constructivism. This theory emphasizes on the development of understanding through social encounters. The most significant bases of social constructivism were laid by Vygotsky in his theory of "Zone of Proximal Development" (ZPD) (Vygotsky, 1962 cited in Santrock, 1998). He suggested that when children engage with adults or older peers, they are able to refine their thinking or performance to make it more effective. Social constructivists suggest that learning is a joint venture between the teacher/caregiver and the learner (Vygotsky, 1978). They believe that knowledge is a social phenomenon which is actively constructed by the learner (Vygotsky, 1962 cited in Santrock, 1998). Social encounters/interactions are key to creation of meaning and understanding. Through dialogue, the teacher should help the learner to refine his/her understanding. Vygotsky argues that children are able to perform a skill or task after adequate observation, instruction and practice. The level at which learning occurs under the guidance of teachers and other experienced adults as well as peers is what is referred to as "Zone of proximal development" (Vygotsky, 1978). Children's observations and enquiry may be superficial and unsystematic without the guidance and examples of the teacher/caregiver (Elstgeest, 1990). It is through social interactions that children get

to learn behavioral and societal norms that guide their lives (Santrock, 1998). Parents and other caregivers are the earliest socializing agents and are a determining influence on an individual's development (Baumrind, 1978 cited in Ambron, 1982). This theory emphasizes the fact that children should be given an opportunity to participate actively in their learning. Teachers/caregivers must instruct and demonstrate to the children how to conserve and protect the elements of nature (Elstgeest, 1990). The expectations are that interaction between learners, teachers and parents/caregivers would help in the construction of environmental conservation and sustainability ethics in the young children.

2. 9 Conceptual Framework

The conceptual framework below graphically represents the concepts under study and their relationships.

Figure: 2



The conceptual framework assumed that environmental education can impart the necessary values, attitudes, knowledge and skills to make children better conservationists in future. The frame work assumed that the curriculum guide (syllabus) should help the teacher to make the right selection of content, approaches, activities and the instructional materials. The ability of the teacher to plan properly should in turn facilitate children's participation in conservation activities. Through their participation, the children would acquire knowledge, skills and moral sense regarding environmental conservation. It is expected that children would develop ethical standards regarding conservation which would be reflected in their practices at school as well as home. If the teachers are not able to plan and organize activities for the children they have no opportunity to participate in conservation activities. It is expected that they would demonstrate low knowledge and moral sense regarding environmental conservation. The framework also brought on board the question of parental participation in school activities. Lack of parental involvement in school environmental conservation activities would translate to lack of collaboration between children, teachers and parents in identifying environmental problems. This would lead to low knowledge and moral sense regarding environmental conservation due to lack of consistency in guiding the children. This conceptual framework also considers school involvement in local community environmental issues as an important aspect in developing a positive attitude towards conservation in the children. The framework assumed that participation in affairs of the community albeit in their own small way would enhance their understanding. This framework associated lack of knowledge, skills and moral sense to unhealthy and unsustainable environment. On the other hand, acquisition of knowledge, skills and moral sense is expected to translate to a healthy and sustainable environment in future.

2.10 Summary of Reviewed Literature

Degradation of the environment has had adverse effects on the human kind. Many devastating consequences of global warming have been experienced. Famine, diseases and poverty are some of the effects of climate change brought about by floods and drought. Conservation and sustainability ethics are important for maintaining a healthy natural world. Traditionally, people used to have an attachment to animals and plants which they protected for different traditional values. This contributed to conservation of the environment. Children as the adults of the future should be helped to practice conservation and sustainable use of the environmental resources. Environmental education is a vital tool for inculcating the necessary values, attitudes, knowledge and skills in the young children. It is important for people to understand that early childhood phase is important for grounding enduring beliefs and societal norms in the children. Action Research and Community Problem-Solving model is the best for teaching environmental education. This is because children appreciate doing or learning something that is useful. Interdisciplinary and Multidisciplinary models of teaching environmental education can be used. However, these methods have been found to be inadequate as the objectives of environmental education are overshadowed by those of other activity areas. In Kenya, ECE curriculum adopts thematic integrated approach. Environmental education is therefore integrated into the existing activity areas. Evaluation model used in the study was the CIPP model because it is holistic and thus provides better understanding of the context and process of environmental education. Social constructivism theory has been employed to inform the study. It emphasizes on observation, instruction and practice as children engage with adults. The conceptual framework used in the study explains the relationships existing between the adults and the children .It emphasizes on the importance of social interactions in learning.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter describes the research design, location of the study and target population, sample and sampling procedures, research instruments, validity and reliability, data collection methods as well as data analysis.

3.2 Research design

This research was an evaluative case study using *ex post facto* design. According to Mugenda and Mugenda (1999), a case study is an in-depth investigation of an individual, group, institution or phenomena. The case under study was one of a group of pre-school children and their environmental awareness. The study was an in-depth investigation on the effectiveness of ECEE curriculum in promoting environmental conservation and sustainability ethics in Kiambaa. According to Yin (1994), case-study research design is used to investigate contemporary phenomenon within its real life context. The researcher had no control over the variables since the study was on phenomena that had already happened (Mugenda & Mugenda 1999). According to Best and Kahn (1993), *ex post facto* design allows the researcher to establish the factors related to the existing conditions retrospectively. The status of environmental conservation and sustainability ethics in pre-children in Kiambaa was investigated.

3.3 Target Population

Pre-schools in Kiambaa district formed part of the target population. Statistics provided by the district centre for early childhood education put the number of pre-schools in the district at 108. The 108 pre-schools are distributed in three administrative zones namely Kihara with 34 schools, Ndumberi 39, and Karuri 35.

The three zones presented a variety of private pre-schools which were 66 in number and public 42. Enrolment data as at the time of the study set the number of children in the pre-schools at 2,660. Out of the 108 pre-schools, 40 had three (3) ECD teachers each making a total of 120. The remaining 68 pre-schools had two ECD teachers each making a total of 136. Altogether the teachers were 256. The head of the pre-school was considered to be the manager. This means that the study targeted 108 managers. The parents in the population were 2,150. This number was less than the number of children because some parents had more than one child in the pre-school. At the same time, only one parent participated in the study as the researcher made use of the morning hours when children were being brought to school. The research also targeted curriculum developers based at Kenya institute of education.

3.4 Sampling and Sample Size

The sample size was based on the time and funds available as proposed by Ogula, (1995). The study used 36 pre-schools which was one third (1/3) of the 108 pre-schools in the population of the study. It was large enough to help in minimizing sampling error (Mugenda & Mugenda, 1999). Stratified random sampling was used to ensure representation. Stratification was done using the criteria of sponsorship and zone of the pre-school. It was assumed that the public pre-schools had similar characteristics which may be different from those of the private pre-schools. There was also need to ensure that pre-schools in the different zones were equally represented. A list of the 108 pre-schools in the district was used as the sampling frame. The names of the ECD centers were listed down according to their zones, namely Kihara, Ndumberi and Karuri. They were also listed down as private or public pre-schools. Six (6) pre-schools were selected from each stratum using simple random

sampling. From each zone six private pre-schools and six public pre-schools were selected. This made a total of 36 pre-schools.

Purposive sampling was then used to select children who have been in pre-school for at least one year. It was assumed that these are children of 5-6years of age. In the views of the researcher, they have acquired knowledge about environmental conservation from school. It was expected that at this age, children have more refined language and can construct longer sentences and use correct grammar (Newcombe, 1996). This made communication easier and the information collected more accurate. The researcher also considered the fact that the ability to use abstract thought increases with age (Green, Flaveell & Flavell, 1998 cited in Cobb, 2001). Children of above five years are also in a better position to participate in various environmental conservation activities. As suggested by Allen and Marotz (1989) cited in Cobb (2001), gross and fine motor skills for such children are well developed. Five (5) children were randomly picked from the 5-6 year old class in each pre-school making a total of 180 children. The teachers of the 5-6 year old children and their parents were purposefully picked. This was because they are the adults who are the immediate models of the children. This meant that from each pre-school, one teacher in the class of the five selected children was purposefully picked. This made the total number of the teachers in the sample to be 36. The 36 managers of the preschools were also purposively picked. Similarly, five parents of the five selected children in each pre-school were purposefully picked making a total of 180. On the other hand fourteen (14) ECE curriculum developers were conveniently picked as they were found to be the only ones available and willing to participate in the study.

3.5 Instruments

A multiple source of data using different instruments was used to allow triangulation hence reliability and objectivity of the information (Clough & Nutbrown 2002). Interview schedules for the pre-school children (Appendix I) and teachers (Appendix V) consisted of unstructured and semi-structured questions respectively to guide the researcher. The children's schedule had 11 items which were meant to highlight the nature of information pre-school children have on issues concerning the environment. It also sought to find out whether they have acquired any skills in carrying out environmental conservation activities. The teachers schedule had 12 questions that informed the researcher about their knowledge on conservation, the methodology and activities they consider to be suitable for the pre-school children.

Observation schedule for the pre-school children (Appendix II) was structured in five rows and three columns. The rows contained general environmental conservation activities. These were activities concerned with aesthetics, cleaning, littering and garbage management, as well as conservation of water, soil and electricity. The aim was to find out whether children were willing to participate in the various activities concerning conservation of the environment. At the same time, the instrument sought to find out whether children have acquired moral sense regarding environmental conservation. The columns were structured to include evidence for reflected behaviour related to responsiveness and moral sense regarding environmental conservation activities. Behaviours which reflect moral sense including respect, care, and concern about conservation issues were to be identified. These were behaviours where children were careful about destroying flowers or young trees. It was also reflected in the way children show concern when others destroy flowers or litter the compound. Behaviours such as collecting litter, sweeping, and wiping tables willingly

without being forced were used to reflect responsiveness. An ordinal scale of measurement was used.

Questionnaire for the teachers (Appendix III) contained 15 semi-structured questions. An ordinal scale of measurement was used. The questions were on their knowledge about environmental conservation activities and what they think about the content in the curriculum. The questions also sought to find out the kind of support the teachers got from the administration. The questions were also structured so as to find out if the community members were involved in school environmental activities. The parent's questionnaire (Appendix IV) was structured with 15 items. An ordinal scale of measurement was used. The aim was to find out what the children were practicing at home. The questions were also meant to find out the opinion of the parents regarding acquisition of knowledge and moral sense by the children.

Questionnaire for the administrators (Appendix VI) contained seven semi-structured questions. It was designed to find out the knowledge that the managers have on environmental conservation, their opinion about ECEE content and the methods used by the teachers. It was also ordered in such a way as to find out what they think about the immediate environment and if the community members were keen on conservation issues. The instrument used a nominal scale of measurement as well as open-ended questions.

(Appendix VIII) was a questionnaire for curriculum developers containing seven semi-structured items. The researcher sought to find out what the developers think about the effectiveness of the ECEE curriculum. The items were related to the

content, methods. activities and teaching/learning materials for ECEE. The instrument used nominal scale of measurement as well as open-ended questions.

Documentary analysis form (Appendix VII) was used as a guide to collect data from documents in the pre-schools. This instrument was structured in four rows and six columns. The columns consisted of the names of the documents to be analyzed. On the other hand, the rows consisted of description, purpose and significance of the documents. Different documents namely scheme of work, lesson plan, record of work and children's work books were used. The scheme of work was to be analyzed to find out the methodology and activities the teachers had chosen. The lesson plan was expected to indicate the actual activities and their specific objectives. The record of work was to be examined to find out the actual work covered within a certain time. From the children's work, the researcher wanted to find out the knowledge and skills acquired by the children

3.6 Validity

Validity was ensured by having the instruments examined by experts to authenticate the content (Best & Khan 1993). The areas that needed adjustment were indicated and necessary changes made to ensure representativeness of the content. Validity was also ensured by training the research assistants on how to get relevant information from the participants. This was done to ensure consistency in observation and assessment of the characteristics under study (Mugenda & Mugenda 1999). The observation schedule was discussed in terms of the behaviours that would reflect responsiveness and moral sense in the pre-school children. Similarly, the interview schedule for the children was discussed in details so as to agree on how to deduce children's speech. A thorough discussion was also held on how to probe for information from the teachers.

The idea was to ensure that they give an in-depth description of the ECEE curriculum. The documentary analysis form was also discussed to ensure that the assistants understood what details to look for in the documents. Piloting was also done to remove any ambiguities in the questions. Validity was also ensured by the use of triangulation from the different instruments. Information provided in the different instruments was collated and scrutinized to see if it corresponded.

3.7 Reliability

Reliability was ensured initially by discussing the instruments with experts who suggested on how to improve on the wording of items. However, before actual data collection for the study, the instruments were tried out on participants in two pre-schools which were not in the research sample. Piloting was done to ensure compilation of anticipated data as suggested by Mugenda and Mugenda (1999). Two teachers, two managers and 10 parents were required to complete the questionnaires and say whether the instructions were clear. They were also expected to single out questions that may have been confusing. Interviews were also carried out with the two teachers and 10 children in the two pre-schools. The researcher also tried out the observation schedule and the documentary analysis form in the two pre-schools. The curriculum developer's questionnaire was tried out on four DICECE trainers. No participant rejected to answering any question. However, the try out revealed faults in some items which required change. The alterations were as follows:

- Teacher's questionnaire items one and nine were restated in order to meet the objectives of the study.
- Teacher's interview schedule items four, five and eight were readjusted to ensure clarity and to make certain that they elicit anticipated data.

- Teacher's interview schedule items six and nine were found to be similar. Item nine was therefore removed and replaced with item 10 so as to avoid duplicated information. Item 12 was restated to ensure relevance to the research questions.

All the other instruments did not require adjustment as they were clear and relevant in terms of the research objectives.

3.8 Procedure for Data Collection

A research permit was obtained from the National Council for Science and Technology for a period starting 14th May 2010 and ending 30th September 2010. During delivery of the questionnaires, the researcher explained the nature of the research as well as its importance. Each questionnaire was also accompanied by a transmittal letter describing the nature of the research. The participants were instructed on how to self administer the questionnaire by the research assistants. At the pre-schools, teachers were requested to help in the random selection of five children in the 5-6 year old (pre-unit) class by providing a list with the names of the children. This facilitated the purposive selection of their parents. The teachers were then asked to distribute the questionnaire for the parents. This was done in the morning as parents brought their children to school. The teachers also received instructions on how to help the parents respond to the questions incase of any difficulty. The parents were required to fill the questionnaire at the pre-school grounds to avoid delay and loss. A follow up was done to clarify issues that were not clear. Questionnaires in the pre-schools were collected as soon as they were finished. On the other hand those for the curriculum developers were collected the last week of May.

Interviews were carried out in the same month of May. The researcher held a training session for one day with the research assistants to ensure that a standard procedure was used during the interviews. All the interviews were done in the school compound on a face to face basis. The teachers' interviews took about 15 minutes with each participant. Note taking took place as the interviews were going on. The pre-school children were interviewed in a group of the five children selected in the class of 5-6year olds. The group interviews were carried out for about 20 minutes in each pre-school. The interviewer made comments/notes when interviewing the children but tape-recording was also carried out. This was done to minimize the time taken for the interviews. The researcher had to make sure that the information recorded was interpreted immediately. It was then collated with data collected through note taking.

Observation schedules were discussed thoroughly with the research assistants. The training was necessary to ensure that they were aware of the behaviours they needed to observe. The observer was instructed to concentrate on the behaviours that reflected responsiveness and moral sense. An ordinal measurement scale was completed as the observation continued. The observation was carried out for one week in each pre-school. Observation was carried out on the five children during snack break and lunchtime. This time was preferred because the children are free to engage in their own activities without the teacher's intervention. At the same time they may get involved in activities like collecting litter and cleaning their tables after meals. It is during the same time that they use water for washing as well as drinking. The observer was interested in keeping count of the incidences of willingness and readiness with which the children did the tasks. As the children engaged in play along the flower beds and elsewhere in the compound, their respect and care for the resources in the environment was to be noted. Concern about destruction of the

available resources was also expected to be evident. Some children were found to be very careful not to destroy flowers or waste water while others did not seem to be bothered. The observer recorded the frequency of reports made by children who were concerned that others were destroying flowers or wasting water. Incidences of care and respect of resources in the environment were also recorded. Similarly, occurrences of destruction and lack of care were recorded.

Documentary analysis form was used to extract details about the content and methodology of ECEE being used in the pre-schools. The researcher used personal copies of the syllabus and handbook for the analysis. The schemes of work and record of work covered were availed by the pre-school administrator on request by the researcher. Similarly, lesson plans and the children's work were availed by the teachers. On the documentary form, significance of the document was noted in terms of what it contains relating to ECEE. The schemes of work were analyzed to find out what content, activities and materials the teachers had prepared. The lesson plan and record of work were expected to show evidence of work to be taught and work already taught respectively. The knowledge and skills gained by the children was checked from their books. The documents were analyzed alongside the teacher's interviews.

3.9 Data analysis

After collection of massive qualitative data, organization had to be done. Organization was done in form of significant patterns and categories to facilitate analyses (Patton, 1990). The information from each instrument was analyzed separately.

The completed questionnaires from the teachers, administrators and curriculum developers were collected and read through to check for completeness. This helped in establishing the accuracy and uniformity in the way the questions were answered. The researcher was able to return to the pre-schools for clarification on any omission in the questionnaires. Responses to open-ended questions in the questionnaires were categorized after all the questionnaires were collected. A coding scheme was used in which responses were grouped into themes and categories based on research questions. A summary sheet was prepared and the responses were transferred to it using tallying method. Information from different questionnaires was recorded on the summary sheet systematically. Nominal data was summed up and the frequencies of the "yes" and "no" responses converted to percentages of the total number. Data measured on ordinal scale was analyzed in terms of determining the frequencies of each rank. The sum of the respondents on the different ranks put on the summary sheet. The frequencies were then converted to percentages to illustrate the relative ranks.

Information collected through documentary analysis was organized around evidence of ECEE content and methodology. A coding structure was used in order to identify significant data. A summary sheet was used and all data transferred to it.

Similarly, data collected through observation was measured at ordinal scale. It was therefore analyzed by determining the frequencies of each rank. It was then transferred to a summary sheet using tallying method. Responses on different ranks were totaled to get the frequencies. The frequencies were then converted into percentages.

Responses from the interviews were recorded in a summary sheet as collection procedure continued. A coding frame was used in which all responses were grouped as per the research questions. A summary of the collated data was put in frequency tables and percentages were computed for easier interpretation. Findings were presented in frequency tables, bar graphs and a pie chart. A comprehensive report on the findings has been written. This report is expected to facilitate precise use of the information by stakeholders in decision making and policy formulation regarding ECEE curriculum.

3.9 Concluding Remarks

The research was a case study using *ex post facto* design. Target population included pre-schools in Kiambaa District Kenya. Pre-school children, their teachers and parents were also included. The sample consisted of 36 pre-schools from which 180 children, 180 parents, 36 pre-school teachers and 36 managers of the schools participated. 14 curriculum development personnel also participated. A multiple source of data was used to ensure validity. Piloting was also done in order to ensure reliability. Questionnaires were distributed through hand delivery. Interviews were done on face to face basis and observations carried out during snack break and lunch break. Relevant documents were analyzed to establish whether they contained environmental conservation content. The parents were asked to fill the questionnaires when they brought their children to school in the morning which they did with minimal assistance. Data collection was completed without any major problem. Data was analyzed using qualitative and quantitative methods. Bar charts and tables were used to present the findings.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.0 Introduction

This chapter presents the findings and discussion organized around the five research questions.

4.1 Instruments return rate

Questionnaire given to the parents were 180 and all were returned. This was 100% return rate. The high return rate was facilitated by the fact that parents filled their questionnaires in the school compound. Those who insisted on doing it at their convenient time and place were followed up closely by the teachers. The pre-school teachers', managers' and curriculum developers' questionnaires equally had 100% return rate.

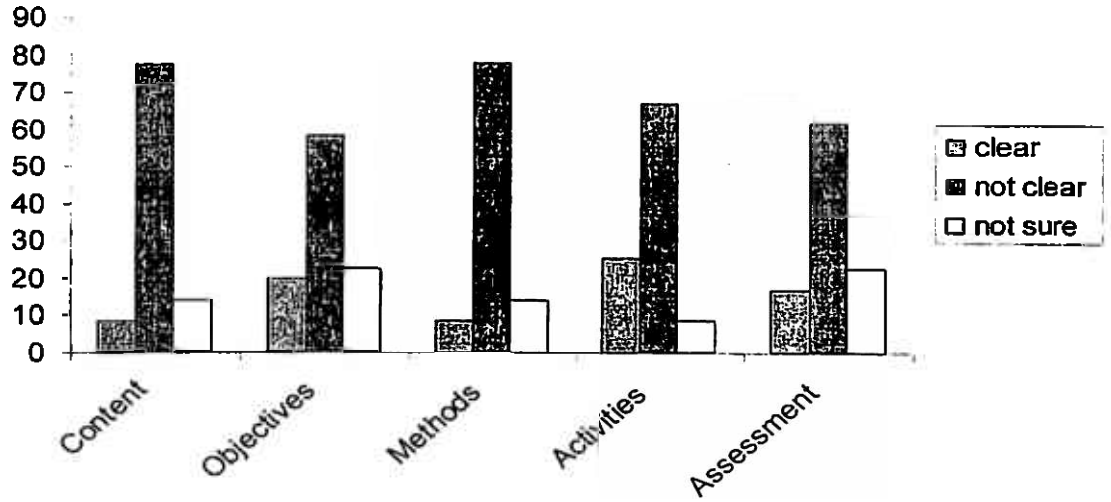
4.2 Impact of Teaching Methods on Responsiveness to Environmental Conservation.

The question on methods was about teachers' knowledge and clarity on how to select the best methods for teaching early childhood environmental education. This comprises the interpretation of objectives in the syllabus, choice of content, activities, materials and assessment techniques.

Figure 3 shows the teachers' opinion on clarity regarding methodology in environmental education.

Figure 3: Teacher's Clarity on Methodology

(N=36)



From Figure 3, 77.7 % of the teachers interviewed were of the opinion that the content of environmental education was not explicitly stated in the syllabus. They argued that it does not clearly state the facts and skills that children are expected acquire. Findings from analysis of the syllabus corresponded with this response. For example in science, the content on animals, plants, soil, water, air, sound and weather have not brought out the concept of conservation. The only content related to environmental conservation involving weather and sources of water was covered through lecturing. Nevertheless, only the description of types of weather and a mention of the sources of water was covered. There was no emphasis on protection of catchments areas or harvesting of rain water and many other conservation activities. In social studies, content on immediate neighbourhood, wild animals and our country has left out any mention of conservation of the environment. Sadly, the content on our

country only dwells on who is our president, our flag and the national anthem. There is no mention about our rivers. forests, lakes, roads. Mountains and many other important resources that needs to be protected. In life skills and religious education, the content on clean environment does not emphasize on activities that are related to environmental conservation. It was also clear that in the schemes of work in all the ECD centres that participated in the study, environmental conservation content was missing. The lessons planned during and before the study did not indicate any environmental conservation content. The record of work document did not indicate any environmental conservation content and neither did the children's books or any other written material.

Information regarding academic and professional qualifications of the teachers who participated in the study indicated that all the 36 teachers were holders of Kenya Certificate of secondary Education (KCSE) certificate. Regarding professional qualifications, 25 out of 36 were trained and holders of certificate in ECE. The remaining 6 teachers had diploma certificate in ECE while 5 were in training. However, the concept of environmental conservation did not seem to be clear to them. There was no evidence of innovativeness concerning environmental conservation activities. "Am not allowed to teach content that is not in the syllabus as it is waste of time" one teacher remarked. She felt that planning for conservation activities would be a departure from the syllabus. It was noted that teachers seemed to concentrate more on academic work related to writing, reading and arithmetic. They appeared to be under pressure to prepare the children so as to achieve a certain standard of performance. The explanation given was that the school management and the parents expect the children to pass the exam for entry to standard one. "If the children fail to pass examination for entry to standard one, the parents will withdraw them from our

school". This was the concern of more than ten (10) teachers. It seems like very little time is spared to involve children in other activities. There was no interaction with the concrete environment as everything was done inside the classroom. Based on Elstgeest and Harlen (1990) views, children should be allowed to go through a natural process of coming to terms with the world through discovery and self initiated activities.

Children should interact with the concrete environment as they participate in various activities. From figure 3, 66.6% of the teachers were of the opinion that they were not clear on the activities children should be involved in. Although they mentioned activities like collection of litter and cleaning of the compound, very few cited watering of flowers. Activities like planting of trees and flowers as well as conservation of water, electricity and soil were rarely cited. These activities were not evident in the pre-schools that participated in the study. Those schools that had tree planting projects only involved the primary school children generally from the upper classes. The pre-school children were not seriously involved even in cleaning of the school compound as most schools have employed people to do the job. In other schools, the primary level children in the upper classes do the cleaning. Evidently, the syllabus has not provided clear-cut guidelines on the kind of activities required. The objective of ECEE is to expose the children to the local natural environment so as to be aware of the problems that are there. This would make them think critically as they look for solutions to the problems.

However, it was established from Figure 3 that 58.3% of the teachers were not clear on the objectives of early childhood environmental education. They argued that they did not understand what the children are expected to achieve. "Most of these children are too young to perform tasks related to conservation of the environment" one

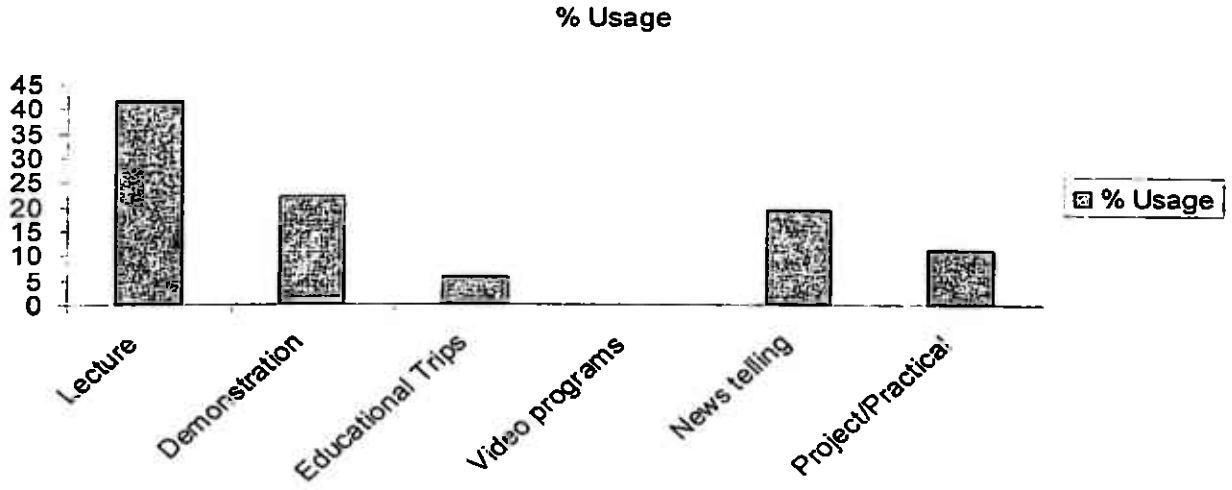
teacher commented. She argued that cleaning the compound or watering flowers and other activities would be too difficult for the young children. It was noted that teachers were not made aware of ECEE objectives during their training. Only 19.4% of the teachers appeared to be aware of the objectives of ECEE as indicated in Figure 3. Such teachers may have the knowledge from their own research and incidental experiences as proposed by Ghafoor (1990). As stated by UNESCO (1977), environmental education in all levels of education should enable the users to assume responsibility and action towards sustainable use of the environment. It appears like this overall goal has not been stated clearly in the syllabus but is left for the teachers to deduce. The guidelines on the choice of activities that are appropriate in training children on becoming environmental activists seemed to be unclear.

The teachers also found it difficult to understand the proper assessment methods. From Figure 3, 61.1% of the teachers were not clear on the methods of assessment to be used regarding knowledge and skills on conservation of the environment. They were also not sure how to measure development of environmental sustainability ethics in children. In the same way, 22.2% seemed to be undecided while only 16.6% suggested observation and questioning as suitable methods of assessment.

From figure 3, 77.7% of the teachers were of the opinion that the methods of teaching EE in pre-school were not clear. It was noted that many teachers used lecture method while discovery and experiment were not suggested. It was obvious that they did not use educational trips or visits to the sites in their local environment. Findings from documentary analysis indicate that the syllabus does not highlight the practical methods required for environmental education. Responses from the curriculum developers did not elaborate the methods in a satisfactory manner.

Figure 4 shows the usage of methods by pre-school teachers in teaching environmental education

Figure 4: Usage of Teaching Methods by the Pre-school Teachers (N=36)



From Figure 4, 41.6 % of the teachers cited (telling) lecture method. Project or practical work was cited by 11.1 % of the teachers which is a very small number. Demonstration and news telling were at 22.2% and 19.4% respectively. Educational trips were at 5.6% while no mention of video programs was noted. It appears that children are not being given a chance to interact with the concrete environment. This means that they are unfamiliar with the issues that are affecting their immediate environment. Action Research and Community Problem-Solving (ARCPS) model has been recommended for teaching environmental education (Knamiller, 1987 cited in Baez *et al.*, 1987). This is issue-based learning approach where the content and skills are learned in light of real local environmental concerns. For example, the water problem in pre-schools may become a project for the school community. Children in collaboration with their teachers could then come up with a plan on how to conserve

the little water available. However, teachers did not seem to understand that project work could provide possibilities of critical thinking and problem solving. Similarly, they did not plan for educational trips which may provide possibilities of exploration and discovery. They also appeared to be unaware of the need to use video programs to make children aware of what is happening in other places. Moreover, in many ECD centers, there is no electricity which makes it impossible to use video programmes. Use of the appropriate methods was a concern of all stakeholders. The teachers, managers and curriculum developers were asked to give their opinion on the adequacy of methods used.

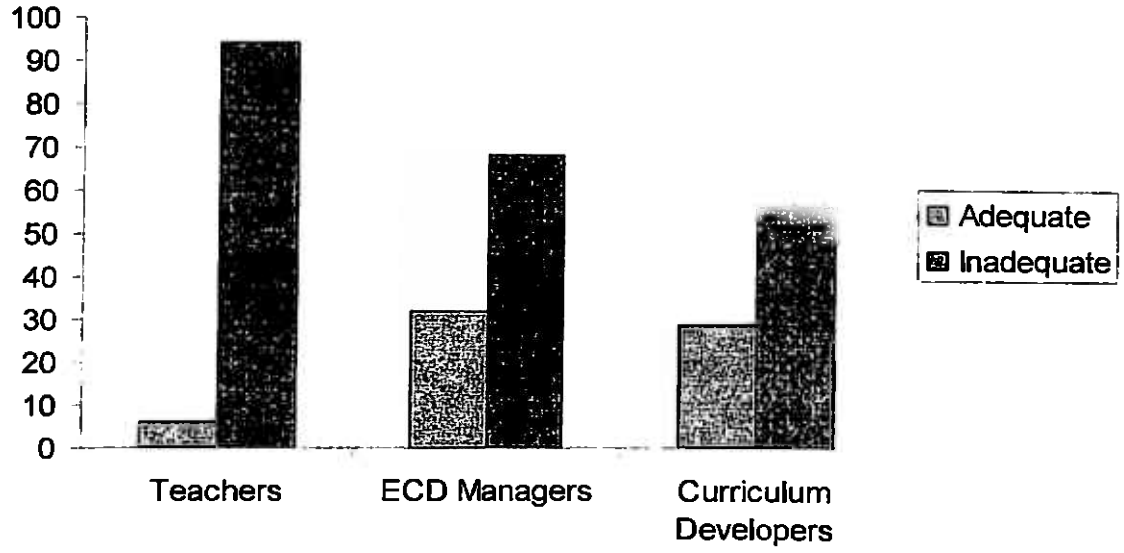
Figure 5 shows opinion on adequacy the methods used by the teachers in environmental education

Figure 5: Opinion on Adequacy of Teaching Methods by Stakeholders.

(N=36)- Teachers

(N=36)-Managers

(N=14)- Curriculum developers



From Figure 5, 94% of the teachers argued that the methods they used were not adequate. From the same Figure, 68% of the managers and 57% of curriculum developers argued that the methods used did not adequately cater for environmental conservation content. Although the teachers complained that the syllabus was not elaborate, they also complained of lack of time to engage in practically oriented methods. As a result of employing methods that are not suitable for environmental education, children's responsiveness to environmental conservation activities appear to be low.

Figure 6 shows the responsiveness of the children to environmental conservation activities

Figure 6: Responsiveness towards Environmental Activities in Pre-school Children

(N=180)

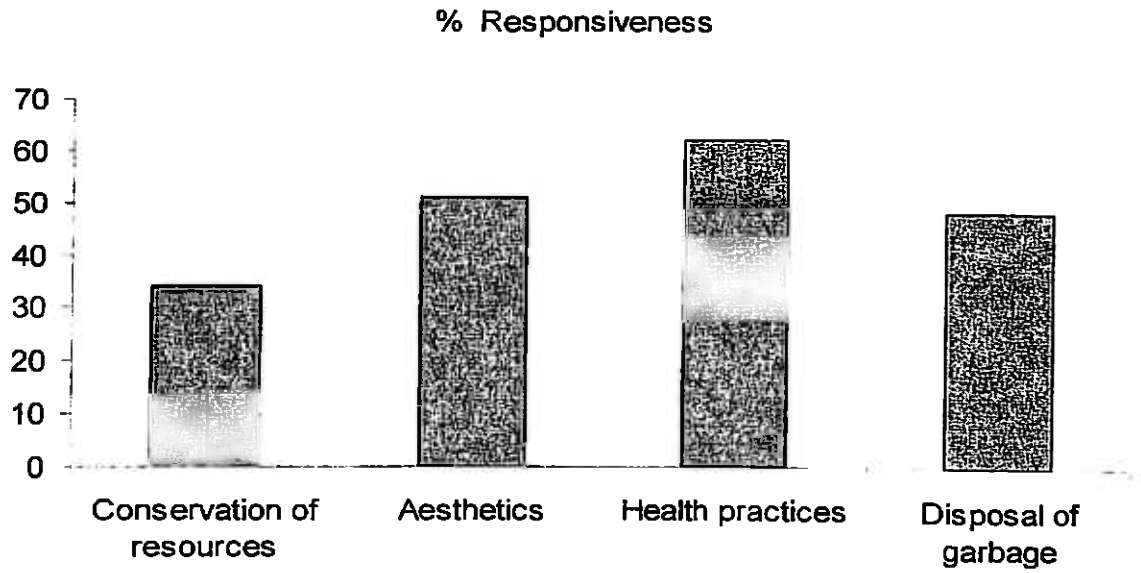


Figure 6 indicates low responsiveness of the pre-school children which is more apparent in the areas of conservation of resources and disposal of garbage at 34% and 48% respectively. Children seem to respond more in the areas of health practices and aesthetics at 62% and 51% respectively. This may be attributed to the involvement of parents in the way they guide their children at home. This concurs with Baumrind's (1978) views cited in Ambron (1982) who proposes that parents and other caregivers are the earliest socializing agents and are important determinants of an individual's development. It may also be attributed to the fact that teachers provide guidance on the same activities. Children are keen on observing what the adults do and they imitate them. "Teacher said that if you do not wash your hands after going to the toilet you will have diarrhea". This was a remark of one child who was castigating her friend who had forgotten to wash hands after visiting the toilet. Generally, all the children were keen on personal hygiene and cleanliness.

Most of the children cited instances where they participated in planting and watering of flowers at home. "My father gave me a tree to plant in our farm" remarked one child. When the child was asked what the importance of planting the trees was, he said it was for fruits. However another child said that trees provide shade when the sun is very hot. Two children remarked with a lot of excitement that they have planted flowers in their homes. Their thrill was evident as they narrated how they water the flowers. Failure on the part of teachers to involve children in practical work related to environmental conservation contributed to the unresponsiveness. Moreover, project/practical work allows children to work in small groups. It also facilitates exploration of a concept in depth as indicated in the Reggio Emilia programme. In this programme, children are allowed to work at their own pace (Reggio Alliance, 2009). It was noted that teachers' pedagogical practices in this case have not been

effective in promoting responsiveness towards conservation of resources in the children. It was also noted that activities and teaching/learning materials used did not match up for meaningful learning to occur. Teaching/learning materials may also contribute to responsiveness to environmental conservation activities.

4.3 Influence of Teaching/learning Materials on Responsiveness to Environmental Conservation.

Table 1 shows the percentage of teachers and curriculum developers who selected a particular teaching/learning material.

Table 1: Choice of Materials by Teachers and Curriculum Developers

(N=36)-Teachers

(N=14)- Curriculum developers

Name of material	Teachers		Curriculum developers	
	Number	Percentage	Number	Percentage
Wall charts	11	30.5	4	28.5
Models	0	0	2	14.2
Pictures	0	0	2	14.2
School garden	3	8.3	0	0
Water	10	27.7	0	0
Soil	3	8.3	2	14.2
Brooms	2	5.5	0	0
Environment	5	13.9	2	14.2
Realia	0	0	4	28.5
Electronic media	0	0	2	14.2
Resource person	0	0	2	14.2

From Table 1, wall charts were chosen by both the teachers and curriculum developers at 30.5% and 28.5% respectively. Water came second with teachers at 27.7 % while curriculum developers did not cite it. Both groups of participants selected the resources in the environment at 13.9 % for the teachers and 14.2% for curriculum developers. The teachers selected school garden at 8.3%. soil 8.3% and brooms 5.5% but the curriculum developers did not. Realia, electronic media, resource person. models and pictures were selected by curriculum developers at 28.5%, 14.2%, 14.2%, 14.2%, and 14.2 % respectively but not by the teachers. It was evident that teachers had a problem in making appropriate choice of materials. For any effective learning to occur, children must have materials to manipulate and work with. It appears like materials suggested did not support the practical activities that were suggested.

Table 2 shows the percentage of teachers and curriculum developers who suggested a particular teaching/learning activity.

Table 2: Choice of Learning Activities by Teachers and Curriculum Developers

(N=36)-Teachers

(N=14)-Curriculum Developers

Type of activity	Teachers		Curriculum developers	
	Number	Percentage	Number	Percentage
Watering plants	16	44.4	2	14.2
Planting flowers	8	22.2	0	0
Collecting litter	12	33.3	0	0
Cleaning compound	2	5.5	2	14.2
Sweeping	4	11.1	0	0
News telling	2	5.5	0	0
Experimentation	2	5.5	0	0
Care for animals	2	5.5	2	14.2
Drawing	2	5.5	2	14.2
Role play	2	5.5	0	0
Drama	2	5.5	0	0
Modeling	0	0	2	14.2
Colouring	0	0	2	14.2
Observation	0	0	2	14.2
Planting trees	0	0	2	14.2

From Table 2, watering of plants, planting flowers and collecting litter were the most common activities with teachers at 44.4%, 22.2% and 33.3% respectively. Apart from water, no other material was cited for the activities mentioned. The curriculum developers cited watering of plants at 14.2% but they did not mention water as one of the materials. Caring for small animals would require that the pre-school keeps the animals. However, both groups of participants never mentioned them as necessary resources.

The fact that environmental education is practically oriented means that tools and other materials to work with are necessary. It seems like the idea of using the environment is not clear to the teachers hence they are not vigilant in the selection of materials. They seem not to bother about ensuring that the selected materials facilitate exploration and discovery. On the theme weather, it seems like only a weather chart has been recommended as a teaching material in the ECD syllabus. There was no suggestion of field trips in the local environment. Harvesting of rain water using various containers has not been emphasized as an activity for conservation of water. Children do not seem to have been trained to use small tools to make channels for rain water to avoid soil erosion. Similarly, planting of flowers and trees which can be done with the use of the same small tools has not been suggested.

The learner has not been placed at the centre of experiences to facilitate critical thinking and problem solving as proposed by (Daily Nation Newspaper, 2009). Though children were involved in activities like collecting litter and cleaning of the compound, these activities were not planned well by the teacher. In most cases they were not even done routinely by the children themselves. A process where teachers and the children identify a problem, discuss and explore ways of solving it is

suggested by (Knamiller, 1987 in Baez. *et al* 1987). For example, conservation of water could be identified as a project to be accomplished by the school community. This is because water is a major problem in most of the pre-schools. This would have meaning to the children because they have experienced the problem. By working with the teachers, the children would understand how to handle the water problem. This is the main idea of Vygotsky's theoretical framework that social interaction plays a fundamental role in creating meaning and understanding in children (Vygotsky, 1978). He also suggests that full achievement of "zone of proximal development" (ZPD) is attained as children engage in activities together with more experienced adults or peers. The current situation in the pre-schools that participated in the study is such that children have not been involved in environmental conservation activities. The few activities they have participated in have not been planned properly. This means that their level of knowledge and skills on environmental conservation is low. Consequently, they are unresponsive to conservation activities to some extent.

4.4 Impact of Environmental Conservation Activities of the School Community on Actual Practices of Children at Home.

Table 3 shows Participation of Children in various Environmental Conservation Activities while in school.

Table 3: Participation of Children in Different Conservation Activities in School. (N=180)-Children

Activity	Percentage occurrence
Planting Flowers	33.3
Watering flowers	11.1
Planting trees	30.5
Watering trees	16.6
Conserving water	91.6
Garbage Collection	80.5
Garbage disposal	36.1
Recycling	16.6
Cleaning rooms & compound	63.8
Soil conservation	8.3
Conservation of electricity	19.4

From Table 3, conservation of water and garbage collection was rated as the most common at 91.6% and 80.5% respectively. Cleaning of rooms and compound followed at 63.8%. However, garbage disposal and recycling were rated lower at 36% and 16.6% respectively. The high rating on conservation of water may be attributed to the fact that most ECD centres have no piped water. Children have learnt to use the little water available carefully. This is evident in the way they preserve whatever water they have carried from home. It indicates that they have observed their parents and teachers doing the same. They seem to be following the instructions they had been given. Collection of garbage was a common routine activity but importance of disposal was not emphasized. Some children knew that the litter should be burnt but did not understand why. In many instances, they did not witness the disposal as this

was done by the primary school children or an employee in the school. More than 50% of the ECD centres did not involve children in simple cleaning jobs like wiping tables after the meals. The excuse given was that parents do not approve of it. However, they were in a rush to engage in other duties like coaching the so called "slow learners". They also had to ensure that the children have some written homework as it is a requirement they must abide with. Planting of flowers and trees were very rare activities at 33% and 30.5% respectively. At the same time, pre-school children were not involved directly in these activities. Such projects were preserved for the primary school children in upper classes.

Watering of flowers and trees was not very common and was rated at 11% and 16.6% respectively. Lack of water for watering flowers and trees seems to have resulted from lack of enthusiasm from the teachers and parents. There are ways of ensuring availability of water for different purposes in the pre-schools. One way would be by harvesting rain water. However, there seems to be no such projects in the pre-schools. It was also noted that more than 50% (n=36) of the ECD centres did not have flower beds. Nevertheless, in the few centres where there were flowers, children demonstrated care and respect. "Paul has stepped on the flowers" one child reported to the teacher. Two children were also heard requesting the teacher to allow them water the flowers. However, the teacher was not keen on the idea as there was no water for that purpose. Conservation of soil and electricity were rated very low at 8.3% and 19.4% respectively. Those who purported to have done work on soil conservation talked of demonstrations in the classroom and not the actual activities in the environment. Conservation of electricity was quite uncommon because most of the ECD centres have no electricity. "Some of these children have no idea about

electricity" remarked one teacher. This is because in their homes and pre-schools there is no electricity.

It was also noted that involvement of parents in school environmental conservation activities was minimal. "Our school is private and the parents pay for all the services". This was a comment by five teachers who felt that parents would not entertain the idea of being involved in school projects regarding environmental conservation.

Table 4 shows the nature of school community environmental conservation activities parents carry out in the pre-schools.

Table 4: Type of activities parents carry out in different pre-schools.

(N=36)

Type of activity	% of Schools
Funding conservation activities	11.1
Providing seedlings	13.8
Supplying water	27.7
Planting and watering trees	5.55
Not available	41.6
Not involved	55.5

From Table 4, parental involvement in school conservation activities as reported by the pre-school managers was found to be quite low. Out of the 36 pre-schools visited, 55.5% managers reported that parents were not involved. There were 41.6% pre-schools which reported that parents are not available to participate as they are busy at their places of work. "Many parents send the house helps/caregivers to collect any information from us" one teacher commented. She felt that it was impossible to get

the parents to participate in any activities in the school especially those not related to academic performance of the child. Lack of involvement of the parents contributes to lack of consistency in training of the pre-school children. This means that what the children learn in school is not reinforced by the parents at home. In Reggio Emilia approach, teachers and parents work in collaboration with the children creating a community of inquiry between the adults and the children (Reggio Alliance, 2009). This means that parents and teachers work in partnership. In this way, children are made to see that there is no disconnection between home activities and school activities. It also ensures that they view the world as a coherent whole (Brown, 1994). Participation of parents in the pre-schools was not in terms of being present during the events. Only two schools reported participation in planting of trees. Ten pre-schools reported that parents supply water while five said that they provide seedlings. Four pre-schools reported that parents funded the activities. It was interesting to find out the actual practices children get involved in at home. The parents provided information on the actual practices their children perform at home.

Table 5 shows the actual activities practiced by children at home and the percentage of parents who reported the practices.

Table 5: Parents who reported actual practice in various activities by their children

(N=180)

Activities	Frequency	% of parents
Tendering of flowers	89	49.0
Cleaning the compound	88	48.0
Tendering trees	35	19.4
Conservation of water	65	36.0
Conservation of electricity	62	34.4
Collection & disposal of garbage	51	28.3

From Table 5, two activities out of the six were found to be the most popular which are tendering flowers and cleaning the compound. From Table 5, 49.0% argued that their children are active in tendering of flowers while 48.8% reported cleaning of the home compound as a popular activity. The high rating of these activities may be attributed to the fact that children are attracted to clean and fine-looking objects in the environment. They are naturally responsive to natural environment and are ready to participate in maintaining cleanliness. A positive interaction with natural environment gives children a source of wonder, joy and awe (Wilson, 1984). Another explanation would be the fact that parents have been guiding them in keeping their home compounds clean. Conservation of water and electricity followed in terms of occurrence at 36% and 34.4% respectively. Only 19.4% of the parents mentioned taking care of trees as an activity that children get involved in. Garbage disposal practice was reported by 28.3% of the parents. This mostly involved burning rubbish in a pit. Some activities like tendering of flowers and trees as well as conservation of electricity were not common in the ECD centres. However, it was evident that some

children have learnt about them from their parents. Activities which were common at home and in the ECD centres were conservation of water and garbage collection.

At the centres, they were at 91.6% and 80.5% respectively while at home they were rated at 48.8% and 36% respectively. The high level at school may be attributed to the fact that the activities at the pre-schools involve other bigger children. This means that the children follow the lead of others who are more aware and conversant with the activities. On the contrary, children at home may be regarded as too young to be given any kind of chores. They may also lack bigger and more informed siblings to emulate. As such, they lack motivation to engage in the activities. Moreover, lack of participation of parents in school community activities may contribute to inability to connect home and school responsibilities. Knowledge on importance of environmental conservation and sustainable use of resources may develop moral sense in the children. This should then lead to care and respect for the environment.

4.5. Effect of Knowledge on Moral Sense regarding Environmental Conservation.

Table 6 shows the occurrence of children's knowledge and moral sense regarding environmental conservation activities

6: Occurrences of knowledge and moral sense in conservation activities (N=180)

Activity	Percentage occurrence			
	Knowledge		Moral sense	
	Evident	Not evident	Evident	Not evident
Conservation of resources	36.1	63.8	39.8	60.2
Aesthetics	46.3	53.3	54.6	45.2
Health practices	59.6	40.4	63.5	36.5
Garbage collection	4.7	55.3	44.7	55.3

Interviews and observations on pre-school children facilitated understanding on the knowledge and moral sense they have acquired. From Table 6, evidence of knowledge in any activity seems to be connected to moral sense regarding the same activity. However, the attainment in both knowledge and moral sense was not high. Knowledge in health practices as well as moral sense regarding the same had the highest instances of occurrence at 59.6% and 63.5% respectively. In environmental aesthetics, knowledge and moral sense were at 46.3% and 54.6% respectively. The high rating of knowledge and moral sense in health practices may be attributed to parental involvement and guidance given at home as well as school. Activities like wiping the table after meals and personal hygiene were common. Activities on environmental aesthetics motivate children as they are naturally fascinated by attractive things. In the views of Wilson (1984), children who are close to nature tend to relate to it as a source of wonder, joy and awe. Nature has the capacity to nurture children's spirits and help them to discover sources of human sensibility (Wilson, 1984). "Flowers smell nice" one child remarked. She was explaining the reason why

she likes tendering flowers. To tender flowers either at home or school is therefore inherent in children. Regrettably, most of the pre-schools did not have flower beds. Conservation of resources scored very low at 36.1% in knowledge and 39.8% in moral sense. Children did not seem to be aware of conservation issues relating to water, electricity and soil. Activities like planting of trees or harvesting of rain water were not well understood by the children. There was no collaboration of children, teachers and parents in identifying environmental problems. Consequently, dialogue and planning on how to solve such problems as suggested by (UNESCO, 2008) was lacking. Such collaboration would ensure that children participate in the actions needed. Moreover, it may help them acquire knowledge and the much needed moral sense.

Table 7 shows participants judgment on whether children are capable of acquiring knowledge and moral sense regarding environmental conservation and sustainability.

Table 7: Affirmation on Acquisition of Knowledge and Moral Sense by Children as reported by Stakeholders.

N=180-Parents N=39-Teachers N=36-Managers N=14 Curriculum Developers

Participants	Percentage affirmative response	
	Knowledge	Moral sense
ECD Managers	71.6	68.0
Parents	24.0	76.2
Teachers	80.5	58.0
Curriculum developers	57.2	42.8

From Table 7. 80.5% of teachers and 71.6% of the managers of pre-schools were of the view that knowledge is attainable. However they seem to rate development of moral sense lower and only 58% and 68% respectively affirmed it. Teachers and managers in the pre-schools understand child developmental stages. They may therefore be in a better position to understand the ability of 5-6year old children in forming concepts related to environmental conservation. On the contrary, the parents underrate the capability of their children in understanding environmental issues. From Table 7, only 24 % were of the opinion that children can acquire knowledge. The rest of the parents argued that the children are too young to understand issues of the environment. However, they were quick to affirm that children are good at obeying rules. They agreed that children are keen on doing what they see their parents do. Furthermore, information obtained from Table 7, (76.2%) affirmed that children can acquire moral sense. It seems like parents do not understand growth and development of children and the age at which they may internalize concepts regarding the environment. This means that they may not understand how to stimulate their children in all the developmental dimensions. They may not understand the importance of early childhood years as the most favourable for developing the desirable attitudes and values as proposed by UNESCO (UNESCO, 2008). Such attitudes and values are the bases for an individual's personality as stated by Baumrin, 1978 cited in Ambron, 1982). In addition, 57.2 % of the curriculum developers who participated in the study argued that knowledge is attainable. It was noted that the feeling was that formative years are very important for development of positive attitudes towards environmental issues. The curriculum developers advocated for motivating experiences in actual conservation activities for the children. They also suggested that teachers should take their work seriously. In addition, they suggested close monitoring and evaluation of

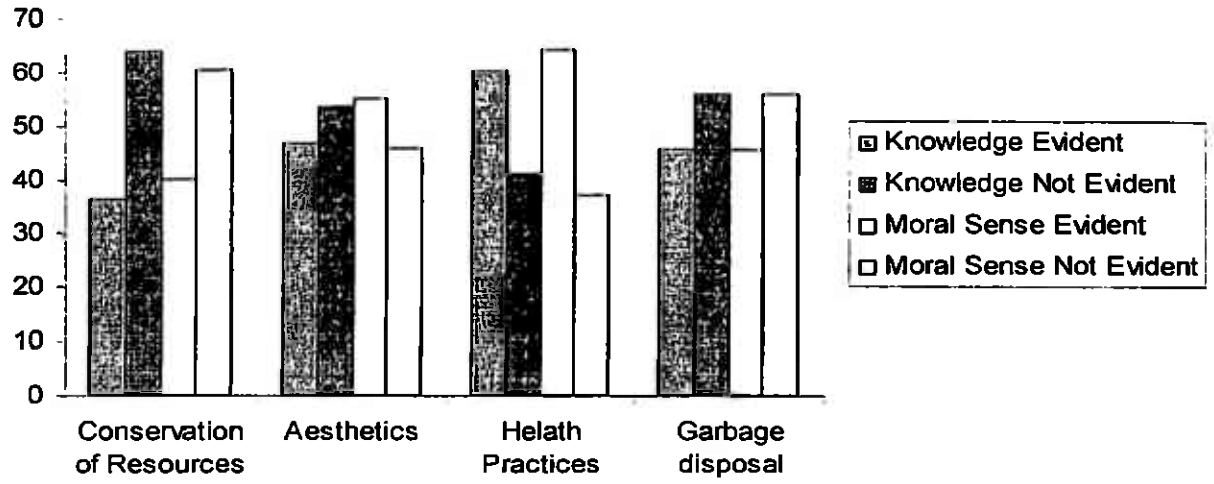
pedagogical practices. However, from Table 7, only 42.8 % of the curriculum developers were of the opinion that children can acquire moral sense.

Notably, the teachers, parents, administrators and the curriculum developers concurred on the fact that acquisition of knowledge and moral sense depends on the adequacy of the methods employed by the teacher. It was apparent that the methods used were inadequate as far as teaching and learning in relation to environmental conservation is concerned. From Figure 5, 94% of the teachers argued that they were not conversant with the proper methods and conceded that their teaching was inadequate. Similarly, 68% of the managers of pre-schools concurred with the teachers in signifying that methods used were not adequate. The teachers and administrators blamed the curriculum guidelines (syllabus) for not making the teaching/learning approaches clear. This concurs with the views of Hopkins (1995) who proposes that educational curriculum and processes have not been revised to integrate sustainability concept. He observes that there is growing global awareness on the need for sustainable development. Nevertheless, measures of environmental conservation and sustainability have not been infused in environmental education. Conversely, from Table 7, 57% of the curriculum developers were in agreement with the inadequacy of the methods used. Nevertheless, they blamed it on the teachers' inability to interpret the syllabus. However, some argued that the syllabus should provide methods and activities that are more practically oriented. This is because children understand the concepts better by participating in the actual projects like planting of trees/flowers, watering them as well as cleaning up activities among many others. When the concepts are well understood, it is easy to develop ethical standards regarding environmental conservation and sustainability at a level congruent to the development stage of the children.

Figure 7 shows the comparison in occurrences of knowledge and moral sense in the different environmental conservation activities

Figure 7: Comparing Knowledge and Moral Sense in different Conservation Activities

(N=180)



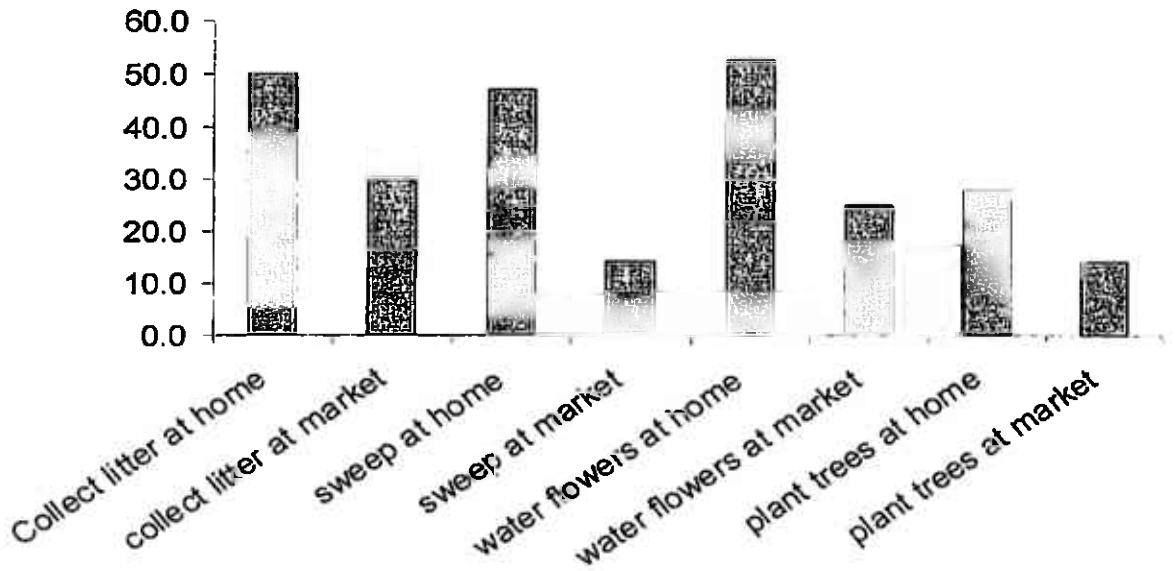
From Figure 7, the higher the knowledge, the higher the moral sense in most of the activities. However, moral sense appears to be slightly higher than knowledge. In conservation of resources, both moral sense and knowledge were quite low at 39.8% and 36.1% respectively. Health practices rated the highest in moral sense and knowledge at 63.5% and 59.5% respectively. Following closely was aesthetics in moral sense and knowledge rated at 54.6% and 46.3% respectively. Garbage disposal had both moral sense and knowledge rated at 44.7%. From these results, it appears that once children acquire understanding on the importance of a particular activity, they develop moral sense regarding the same. As proposed Piaget (1932) and Kohlberg, (1976) cited in Bennars (1993), development of moral sense depends on the

cognition or knowing. However, as Wilson, (1984) proposes, nature has the capacity to nurture children's spirits and help them discover sources of human sensibility. It appears that children find nature attractive and are ready to care for it when given a chance. Involvement in local environmental issues may help children acquire a positive attitude towards conservation activities.

4.6 Influence of Involvement in Local Environmental Issues on Attitude towards Environmental Conservation.

Figure 8 shows the number of children who were willing to participate in environmental conservation activities in the local environment

Figure 8: Children's Willingness to participate in various conservation activities. (N=180)



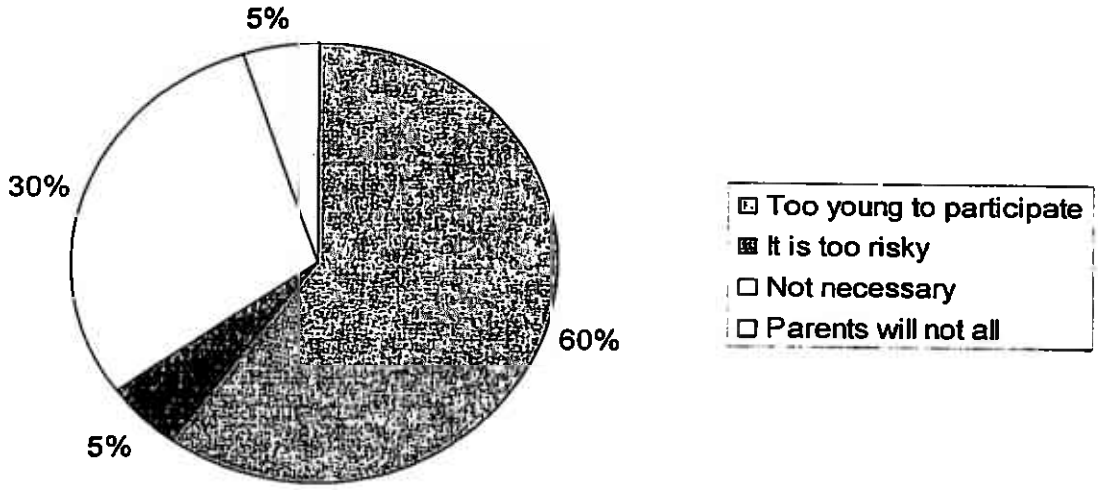
Children were found to be willing to participate in environmental conservation issues at home but not many were eager to do it in the neighbouring environment. Figure 8 shows simple activities that they are familiar with. From Figure 8, 50% of the children

who were interviewed were willing to collect litter at home but only 30.5% were for the local market. From the same Figure 8, 47.2% of the children were willing to sweep at home but only 13.9% would do it at the local market. Watering of flowers had 52.7% of the children who were eager to do it at home while only 25.0% were for the local market. Tree planting was somewhat unfamiliar to the children. From Figure 8, only 27.7% were willing to plant trees at home while just 13.9% were for the local market. Some children argued that they would get too tired while others complained that the market place is a dirty place. They feared they might become sick but at the same time were afraid of the homeless children "chokoras"residing in the market place. There were those who argued that the market is loaded with rotten fruits and vegetables which smell really bad. It was noted that children were ready and willing to do all that is necessary to make their home compounds clean, free from diseases and "smart"(aesthetically acceptable). However not many were ready to participate in making the neighbouring (local) environment clean. This was an indication that children have not been involved in conservation activities in the local environment. It indicated lack of understanding that everyone in the community has a responsibility to care for the environment. The teachers had their reasons for not engaging the children in local community environmental activities.

Figure 9 shows the responses of teachers to the question on why children are not involved in local environmental conservation activities.

Figure 9: Reasons for Lack of Involvement of Children in Local Environment Issues

N=36



From Figure 9, 60% of the teachers said that the children were too young to participate while 5% argued that it would be too risky. 30% alleged that it was not necessary to involve them and 5% argued that parents would not allow. Those who said they are too young argued that they would not manage to do the required tasks. Another argument was that it would be unsafe as controlling the children would be difficult. They feared that they may get injured. The 30% who said that it would be unnecessary argued that their contribution would be too small to make any difference. At the same time, the 5% who were convinced that the parents would not consent to it were afraid of making them unhappy. "I don't want to loose my job" remarked one teacher. She argued that parents may view involvement of children in conservation activities as a punishment. Participation of children in any local community conservation activity was an unfamiliar occurrence. This means that they do not see

the relationship between themselves and local environment issues. It was however noted that environmental conservation activities are quite uncommon in the community. Nonetheless, teachers did not appear to understand the need to include children in the affairs of the community albeit in their own small way.

It was also noted that teachers were not innovative in terms of organizing activities that the children can engage in during a community environmental activity. They seemed to fear the reaction of the parents if they came up with such activities. This indicated lack of confidence in their ability to handle such activities. They did not understand that knowledge, attitudes and moral sense cannot develop in a vacuum but in a rich context of social interactions (Santrock, 1998). They also did not seem to understand that children must be made aware of the local environmental issues so as to develop their critical thinking abilities. Their intellectual curiosity and interest in reasoning may be exhibited in terms of asking a myriad of questions (Elkind, 1976). The teachers and parents did not seem to recognize the fact that analytical and critical thinking skills that allow problem solving must be developed in early childhood for future improvement of the environment. As indicated on Figure 9, 58% of the teachers viewed the children as too young to participate. They failed to understand how mere observation or just singing about the activity may help in boosting their understanding. However, in the views of Daily Nation Newspaper (2010), education reform is needed so as to liberate children to explore, experiment, discover and reflect in order to develop innovative and creative capacities. This is what the future generation requires for sustainable environment.

4.7 Concluding Remarks

Pedagogical practices employed by the teachers are not effective in developing responsiveness towards conservation of environment in the children. Clearly there was lack of participation by the pre-school children in activities concerning conservation. It was also clear that the pre-school children had not acquired adequate knowledge for development of moral sense towards conservation and sustainable use of the environment. It was evident that they have not been sensitized properly in terms of respecting and caring for the environment. However some children seemed to have acquired knowledge and skills from home. This was an indication that they practice some conservation of environment being guided by their parents. Activities that seemed familiar to them were environmental aesthetics and health practices. It was obvious that they practice the same in school and at home. The pre-school children did not seem to have a positive attitude towards participation in issues concerning the local environment. It was quite evident that they have not been involved in such activities. It was noted that the syllabus was not explicit in terms of content, methods, activities and learning resources. At the same time teachers seemed to lack innovativeness in terms of the choice of approaches to employ in teaching conservation and sustainability concepts. Consequently the ECE curriculum was found to be ineffective in promoting environmental conservation and sustainability ethics in the pre-school children.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

5.1 Introduction

This chapter gives the summary, conclusions and recommendations from the findings of the research study. It also includes suggestions for further research studies

5.2 Summary

The purpose of the study was to evaluate the Early Childhood Education curriculum in terms of its effectiveness in promoting environmental conservation and sustainability ethics in the pre-school children in Kiambaa District Kenya.

The research was a case study using *ex post facto* design. It was an in-depth study of a group of pre-school children in Kiambaa District Kenya. The factors leading to their environmental conservation and sustainability ethics were determined retrospectively. The population in the study included pre-schools in the district, pre-school children, teachers, managers of the pre-schools and parents. Curriculum developers were also included. A sample consisting of 36 pre-schools, 36 pre-school teachers, 36 managers of the pre-schools, 180 pre-school children, 180 parents of the selected children and 14 curriculum developers was used. The instruments included interview schedules for teachers and children, questionnaires for parents, teachers and curriculum developers, observation schedule for the children and documentary analysis schedule. Data analysis was done qualitatively and quantitatively then presented through tables and charts.

The effectiveness of the ECE curriculum in promoting environmental conservation and sustainability ethics in the pre-school children was determined by judging the responsiveness of children to conservation issues. Activities observed included collecting litter, watering flowers, conserving water and health practices among others. In addition to that, their moral sense in terms of care and respect of the environment were observed. Indicators of moral sense included concern about littering the compound, wastage of water, destruction of flowers among others. Attitude towards conservation and the actual practices of children were indicated by negative or positive responses towards involvement in various conservation activities in the environment. It was established that the pre-school teachers in Kiambaa district were not very clear on the pedagogical practices required for teaching environmental education. A high percentage of teachers argued that the content was not explicitly stated in the syllabus. At the same time, they were not very clear on the objectives of early childhood environmental education. This makes their choice of methods and learning activities deficient. A high percentage of teachers used lecture method as opposed to participatory approaches. Children were not engaged in project or practical activities. Educational trips even to their local environment were not undertaken. This means that they used pedagogical practices which were not effective as the children lacked responsiveness to conservation issues. However, the curriculum developers argued that the content was provided in the syllabus. They suggested that well trained teachers should be able to interpret the syllabus and come up with proper methods. Nevertheless some curriculum developers argued that environmental education should be more practically oriented.

The learning materials selected by the teachers were not effective in the learning/teaching of environmental education. It was established that the teachers

were not very sure of the materials that would correspond to the activities required for conservation of the environment. This indicated lack of clear cut guidelines in the syllabus regarding the resources to be used as well as lack of innovativeness on the part of the teachers. The activities that the teachers and curriculum developers selected were not practically oriented. However, there was consensus among the participants in approving practical activities related to the environment itself.

Environmental conservation activities that are carried out by school community did not seem to have much influence on what the children do at home. Children appear to have knowledge on health practices as well as aesthetics. These are activities that children participate in both at home and school. However, activities like planting of trees and flowers are done at home but not at school. The children are not actively involved in conservation activities that go on at school as there are bigger peers or employed persons to do the job. Moreover, parents are not involved in the school community environmental conservation activities. This brings about disconnect between home and school activities. Lack of collaboration between the children, parents and teachers brings about inconsistency in guiding the children.

The study also established that knowledge and moral sense had some connection. Though the two were found to be low, there was a clear link. Children were found to have knowledge in health practices and aesthetics which are most common at home and school. Their moral sense regarding the same activities was also high. However, activities such as conservation of resources and disposal of garbage were quite unfamiliar to them. Collection of garbage is common in schools but in most cases the children are not involved directly. This means that they have low level of knowledge regarding such activities which translates to low level of moral sense. It was

established that teachers, ECD managers and curriculum developers consider children of 5-6years capable of achieving Knowledge and moral sense regarding environmental issues. However the parents did not appear very sure that they can acquire knowledge. Nevertheless, they were convinced about acquisition of moral sense.

Pre-school children in Kiambaa have not been involved in local community environmental conservation activities. The teachers had several reasons for not involving them. The most common explanation was that the children are too young to participate and that it was not really necessary. They seemed not to understand the importance of formative years in grounding important values and attitudes regarding the local environment. Consequently, the children seem to be ignorant about the fact that there are environmental problems being faced by the community. They seem to have had no opportunity to explore and critically think of ways and means of solving problems in their immediate neighbourhood. However, it was established that the local community rarely engages in environmental conservation activities. From these findings, it shows that development of environmental conservation and sustainability ethics in the young children was uncertain.

5.3 Conclusion

It was evident that the teachers were not using the proper pedagogical practices. This may have been caused by lack of clarity on the part of curriculum guidelines. The manner in which the content on environmental conservation is presented in the syllabus is vague. In addition, the activities suggested in the hand book are not explicitly related to conservation of the environment. It calls for a very high level of innovativeness and creativity on the part of the teachers which was not evident. This

translates to arbitrary preparation by the teachers leading to lack of effectiveness in promoting conservation and sustainability ethics in the children. However, teachers and curriculum developers were in agreement that pre-school children can acquire knowledge and moral sense regarding environmental conservation. It was also evident that both the teachers and curriculum developers were supporting the idea that the guidelines in the curriculum should be made lucid.

There is lack of involvement of the pre-school children in activities regarding environmental conservation even at the school community level. Many ECD centres have employed people to do the work. Those in public primary schools delegate the duties to the bigger children. There was a tendency to perceive the pre-school children as being too young to participate in the activities. This in turn makes the children view such duties as not being their concern. Moreover, the fact that parents are not involved in the school community activities makes them fail to see the connection between what happens at school and at home. There is lack of collaboration between the children, teachers and parents. The fact that children are not involved in local community environmental conservation activities makes it difficult for them to develop a sense of responsibility and morality towards environmental issues. They do not understand that as members of the community they have a duty to protect the environment. Parents and teachers have failed to recognize the fact that they cannot simply wait for children to mature so as to inculcate ethical standards regarding protection of the environment. There is need to ensure that early childhood phase is exploited fully in terms of grounding important values and attitudes in the children as the adults of tomorrow.

The education system of our country is so much centered on examinations. Pre-school children have not been spared the craze of academic achievement. This system does not nurture critical thinking and problem-solving skills as it is examination oriented. Pre-school children in Kiambaa seem to have been denied time to play, explore, discover and experiment. Teachers seem to work under pressure to maintain an "acceptable" standard set by the parents and managers of the pre-schools. This spares no time for the teacher to prepare adequately for self discovery by the learner. It means that children cannot learn through projects or educational trips as it is viewed as waste of time. Most of their time is spent in the classroom listening to the teacher and writing or reading what the teacher gives them. This expository approach denies the children a chance to actively participate in learning. The teachers have adopted lecture method accompanied by a lot of memorization to ensure that the children pass examination for entry to class one. Without project work and visits to local environment sites, environmental education is not effective. There is need to modify the way in which the pre-school children are handled to make them internalize important concepts regarding environmental conservation and sustainability.

5.4 Recommendations

The following recommendations were made subsequent to the conclusions.

i. A thorough review of early childhood education curriculum should be undertaken by the curriculum developers. Clear-cut guidelines should be provided in the syllabus to enable teachers to prepare adequately. The content to be covered should be made explicit for the sake of teachers who may not be innovative enough to make the expected interpretation. The appropriate

activities and learning/teaching materials must be recommended for the teachers.

ii. The Ministry of education should ensure that teachers are given refresher courses on environmental education. This would help them in their planning for the activities to be undertaken by the children. There is also need to in-service the teacher trainers on methodology and resources for ECEE. Pre-school teacher training programmes must incorporate environmental conservation content. This would ensure that teachers are well trained on conservation methods and the proper activities to involve children in. The teachers should be well trained in methodology to eliminate any uncertainty regarding interpretation of the curriculum.

iii. The Ministry of Education should assist pre-schools to come up with an activity schedule for environmental conservation activities. Such a schedule should include the children, parents and the teachers. Through the same schedule, children should also be involved in the local environmental conservation activities. They could be allowed to participate in their own small ways like singing, observing or doing small tasks like watering plants and many otners. This would help them participate and internalize the issues facing the community. They may also have a chance to dialogue with the adults by asking them questions regarding the environment. Such questions must be answered in a way that will help them understand nature. It would also help them understand the need for all members of the community to participate. The children would also get a chance to discover, experiment, and

come up with critically thought out solutions to problems in their environment.

iv. The Ministry of Education should ensure that the education system offers practically oriented activities for the children. The main aim of education should not be to pass examinations only. The present educational culture does not stimulate inquiry, investigation or critical thinking. The children do not get a chance to learn at their own pace. This means that they cannot develop their talents to the fullest potential. This culture should change so that the children can be given a chance to explore and discover for themselves. Environmental education requires an education culture that is liberal.

v. The Ministry of education should consider offering environmental education as an independent unit of study in both teacher training and pre-school programmes. This would ensure that environmental conservation and sustainability issues are adequately covered.

This subject requires further research for the reason that it is a very critical issue. This is because environmental degradation must be curbed. Young children who are the adults of tomorrow must be prepared adequately to use the resources in the environment in a sustainable manner in future.

5.5 Suggestions for further research

The following topics have been suggested for further research.

i. A large scale research study covering a bigger population in the country should be done. The effectiveness of early childhood education curriculum on promotion of environmental conservation and sustainability ethics in young children needs to be evaluated.

ii. Research study on environmental conservation activity schedule for pre-schools should be undertaken. This would ensure smooth running of environmental conservation activities in the pre-schools in future. The pre-school children all over the country would benefit from active participation in conservation activities.

iii. Research on the opinion of community members regarding involvement of pre-school children in local environmental conservation issues should be undertaken. It would be important to understand what the adults think about inculcating necessary societal norms in the children. It would also be a basis for community sensitization regarding inclusion of young children in conservation activities.

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APPENDICES

APPENDIX (I)

INTERVIEW SCHEDULE/GUIDE FOR CHILDREN

Any information given to the interviewer shall be held confidential and only used for the purposes of research.

1. What is the name of your school? Is your school beautiful? Are there flowers? Have you ever planted flowers?
2. What is the name of your teacher? Does your teacher ask you to collect rubbish in the school compound? What do you do with the rubbish and why?
3. Do you sometimes carry things in a polythene bag? What do you do with it when it gets dirty?
4. When you are thirsty where do you get water to drink? Do you know where the drinking water comes from?
5. What is rain? Where does the rain water come from and where does it go? Explain how you can collect some drinking water from the rain?
6. Do you know what a river is? Where does the river water come from?. Have you ever seen fish or frogs in the water?
7. When the sun is very hot where do you like to sit to avoid getting hot?. Are there trees in your school? Do you like sitting under a tree? What do you feel when sitting under a tree? Would you like to have many trees in your home or in your school? What is a forest?
8. Why should people plant a lot of trees in their school and at home? Have you ever planted a tree, if so where?
9. What happens to maize and bean plant when it is very hot?. What do the plants need when it is very hot?
10. When it has not rained for a long time, there is a lot of dust. Do you like dust? If not, why?
11. What would you like to do to make your home compound clean. Would you like to help in cleaning-up the market place near your home? Say why.

APPENDIX (II)

OBSERVATION SCHEDULE FOR THE CHILDREN'S ACTIVITIES

Name of Pre-school---------- Date----------

Number of 5-6 year old children in the center----------

Use the rating scale below by inserting the appropriate number for the behaviour observed

Highly evident	HE	5
Evident	E	4
Slightly evident	SE	3
Barely evident	BE	2
Not evident	NE	1

Environmental Activities/ Knowledge gained	Evidence of reflected behaviour	
	Responsiveness(enthusiasm, eagerness, willingness to act without coercion)	**Moral sense** (concern, care and respect for environment)
Conserve resources Planting trees Conserve water Conservation of soil Conserve electricity		
environmental aesthetics Planting flowers watering of flowers Caring for flowers		
Health practices Cleaning rooms Cleaning compound		
Disposing garbage Collect litter Re-use Recycling		

APPENDIX (III)

TEACHER'S QUESTIONNAIRE

To ensure complete confidentiality please do not write your name.

In the table below, respond by crossing (x) the appropriate number against each statement that most represents your feelings.

Strongly agree	SA	5
Agree	A	4
Undecided	U	3
Disagree	D	2
Strongly disagree	SD	1

	5	4	3	2	1
The objectives of ECEE were made clear to me in college					
Objectives of ECEE are clearly stated in ECDE syllabus					
Conservation methods are clearly stated in ECDE syllabus					
Engaging in conservation activities creates awareness in children					
Conservation activities are not necessary for children					
Planning for conservation activities for children is easy					
Clear-cut guidelines for planning not provided in ECDE syllabus					
Children enthusiastically participate in conservation activities					
Children acquire moral sense in conservation of environment					
Knowledge on conservation not achievable in children					
Parents participate in conservation activities in school					
Methodology and content on conservation is clear in curriculum					
ECE curriculum needs improvement regarding EE					

APPENDIX (IV)

PARENTS QUESTIONNAIRE

Information provided will be held in complete confidence

In the table below, respond by crossing (x) the appropriate number against each statement that most represents your feelings.

Strongly agree	SA	5
Agree	A	4
Undecided	U	3
Disagree	D	2
Strongly disagree	SD	1

	5	4	3	2	1
My child shows care and respect for flowers					
My child destroys flowers in our home compound					
I get involved in conservation activities in my child's school					
I have not been involved in environmental activities in my child's school.					
My child is interested in keeping the home compound clean					
My child shows no interest in cleanliness of the home compound					
My child understands connection between trees and rain					
My child does not understand the importance of tree planting					
My child avoids wastage of water					
My child does not understand the need to conserve water					
My child insists on putting off lights not in use in our home					
My child does not understand the need to conserve electricity					
My child is interested in re-using polythene bags					
My child insists on burning garbage in our home					
My child has no knowledge of importance of cleanliness and disposal of garbage					

APPENDIX (IV)

PARENTS QUESTIONNAIRE

Information provided will be held in complete confidence

In the table below, respond by crossing (x) the appropriate number against each statement that most represents your feelings.

Strongly agree	SA	5
Agree	A	4
Undecided	U	3
Disagree	D	2
Strongly disagree	SD	1

	5	4	3	2	1
My child shows care and respect for flowers					
My child destroys flowers in our home compound					
I get involved in conservation activities in my child's school					
I have not been involved in environmental activities in my child's school.					
My child is interested in keeping the home compound clean					
My child shows no interest in cleanliness of the home compound					
My child understands connection between trees and rain					
My child does not understand the importance of tree planting					
My child avoids wastage of water					
My child does not understand the need to conserve water					
My child insists on putting off lights not in use in our home					
My child does not understand the need to conserve electricity					
My child is interested in re-using polythene bags					
My child insists on burning garbage in our home					
My child has no knowledge of importance of cleanliness and disposal of garbage					

APPENDIX (V)

INTERVIEW SCHEDULE FOR THE TEACHERS

The information provided will be handled in complete confidence.

1. What are your qualifications?

Academic----------

Professional----------

Years of teaching----------

2. Are you aware of the environmental problems affecting climatic change in the world today? If yes cite those that you can remember.

3. Did you learn about environmental conservation methods in college? If so what methods were you taught to use in educating children on environmental conservation?

4. State the activities that children are involved in when learning about environmental conservation.

5. Name some of the teaching/learning materials that children use in environmental conservation activities? Describe the impact of the resources on the interest of children.

6. Is the school community involved in any activities that are geared towards conservation of the environment? Describe such activities.

7. Are the parents involved in the activities? If so explain how they get involved. If not explain why.

8. Cite any local community based environmental conservation activities? Comment.

9. Have the children been involved in local community environmental conservation activities? If so comment on their involvement.

11. Would you say the children have acquired environmental conservation and sustainability ethics? Explain.

12. Comment on the content and methodology for environmental conservation provided in the NACECE/DICECE curriculum.

APPENDIX (VI)

QUESTIONNAIRE FOR THE MEMBERS OF MANAGEMENT

For complete confidence purposes, please do not enter your name in this Questionnaire.

1. Are there any human activities in this area that are detrimental to the environment?

[Yes] [No] If your answer is yes, cite the activities.

2. In your opinion, is the public aware of the need to conserve the environment?

[Yes] [No] If no, how can the school community participate in creating awareness?

3. The pre-school children are the adults of tomorrow. Do you think they are ready to learn about environmental conservation or are they too young?

[Ready] [Not ready]

Explain your answer.

4. In your own view, is environmental conservation content well covered in the NACECE/DICECE curriculum for ECDE?

[Yes] [No] [Not sure]

If no, suggest the kind of content you would recommend to be included.

5. What is your opinion on the methods applied by the teachers in educating children on environmental issues?

[Adequate] [Inadequate]

Explain your response.

6. Are there any activities the pre-school children are routinely involved in when in school that help in conserving the environment?

[Yes] [No]

If yes, describe the activities.

7. In your opinion, have the children in this center developed a behavior or lifestyle that makes them environmental activists.

[Yes] [No]

Explain your answer.

APPENDIX (VII)

DOCUMENTARY ANALYSIS

The following documents will be analyzed for any information on environmental education content.

Name of document	Curriculum guidelines	Schemes of work	Children's books	Lesson plan	Record of work
Description of the document					
Purpose of the document					
Significance of the document					

APPENDIX (VIII)

QUESTIONNAIRE FOR CURRICULUM DEVELOPERS

For complete confidence, please do not put your name on the questionnaire

1. Have you been involved in the preparation of Early Childhood Education (ECE) curriculum? [Yes] [No]. If yes. which activity area have you worked on?

2. In your view, is the content on conservation of environment explicitly stated in the curriculum? [Yes] [No] If yes, in which activity area. Explain.

3. Are the approaches and methods for teaching about conservation of the environment clearly stated? [Yes] [No]. If yes, cite some of them.

4. Has the curriculum suggested the teaching/learning resources [Yes] [No]. If yes, suggest some of them.

5. Are the learning activities clearly stated in the curriculum? [Yes] [No] If yes, suggest some of the possible activities.

6. National goal number eight states that education should foster positive attitudes towards environmental development and conservation in the youth. Does this include pre-school children? [Yes] [No]. Explain.

7. Millennium development goal number seven is to ensure environmental sustainability by 2015. In your opinion, is the ECDE curriculum sufficiently preparing the young children towards attainment of this goal? [Yes] [No]. Explain.

8. In your opinion, is the ECDE curriculum helping to promote environmental conservation and sustainability ethics in the young children? [Yes] [No]. Explain

APPENDIX (IX)

RESEARCH AUTHORIZATION FROM NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

REPUBLIC OF KENYA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLO

Telegrams: "SCIENCETECH", Nairobi
Telephone: 254-020-241349, 2213102
254-020-310571, 2213123,
Fax: 254-020-2213215, 318245, 318249
When replying please quote

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref: NCST/RRI/12/1/SS/333

Date: 14th May, 2010

Eunice NgendoMiringu
University of Nairobi
P.O Box 30197
Nairobi

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Evaluation of the Effectiveness of Pre-School Curriculum in Promoting Environmental Conservation and Sustainability Ethics in Kiambaa District, Kenya "*** I am pleased to inform you that you have been authorized to undertake your research in ***Kiambaa District*** for a period ending ***30th September , 2010.***

You are advised to report to ***the District Commissioner and the District Education Officer of Kiambaa District*** before embarking on your research project.

Upon completion of your research project, you are expected to submit two copies of your research report/thesis to our office.

P. N. NYAKUNDI
FOR: SECRETARY/ CEO
Copy to:

The District Commissioner
Kiambaa District