"THE INFLUENCE OF ENVIRONMENTAL EDUCATION ON CONSERVATION AMONG SECONDARY SCHOOL STUDENTS IN NAKURU TOWN MUNICIPALITY"

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DECLARATION

This Research Report is my original work and has not been submitted for a degree in any other university.

..... 04/09/2010

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L50/72382/2009

This Research Report has been submitted with my approval as university supervisor.

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DEDICATION

This research work is dedicated to my wife, *Janet Wangari, my* daughter *Mary Wambui* and my son *Elvis Karanja.*To my parents Mr and Mrs Karanja for the sacrifices they made to see me through the school system in my formative years. Thank you all for your unwavering support and encouragement throughout my study. God bless you.

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ABREVIATIONS AND ACRONYMS

BATNEEC: Best Available Technology Not Entailing Excessive Costs

EE: Environmental Education

EIA: Environmental Impact Assessment

EMCA: Environmental Management and Coordination Act 1999

FEE: Foundation for Environmental Education

GLOBE: Global Learning and Observation to Benefit the Environment

HDGC: Human Dimension of Global Change

IGNOU: Indira Gandhi National Open University

KIE: Kenya Institute of Education

KOEE: Kenya Organisation for Environmental Education

MHRD: Ministry of Human Resources Development

MOEF: Ministry of Environment and Forestry

NCERT: National Council for Environmental Research and Training

NEAC: National Environmental Awareness Campaign

NEAP: National Environment Action Plan

NEMA: National Environment Management Authority

NGOs: Non Governmental Organisations

PTE: Primary Teacher Education

QASOs: Quality Assurance and Standards Officers

RRAs: Regional Resource Agencies

SPSS: Statistical Package for Social Sciences

TTCs: Teachers Training Colleges

UN: United Nations

UNEP: United Nations Environmental Programme

UNESCO: United Nations Educational Scientific and Cultural Organisation

USA: United States of America

ABSTRACT

This research study aimed at investigating the effects of environmental education among secondary school students who have already gone through the primary school cycle of education. The investigation was particularly interested in finding out the current position of these youths in relation to the objectives of the study. This includes, the status of EE and evaluation among secondary school students, the relationship between EE and conservation, lessons learnt from previous EE evaluation, sources of information on EE for the youth and investigation of the challenges that exist in EE and how to face them. The level of awareness about the current environmental issues affecting the world and Kenya in particular and their understanding of basic environmental concepts like conservation and management were also assessed. The research study used a descriptive and empirical survey design because both qualitative and quantitative data was collected. Data were obtained by means of questionnaire, interview guides, observation schedules and content analysis of the various syllabuses and corresponding teachers' guides. The data was collected from selected schools and students in Nakuru town municipality. Random and purposive sampling was used to get the desired samples. Questionnaires were used to collect primary data. Secondary data was collected from documented information to support primary data. A total of three hundred and eighty five students in nineteen schools were included in the study using random sampling method. The data collected was processed, coded and analysed using Statistical Package for Social Scientists (SPSS). The findings are presented using tables and content analysis. The study findings revealed that majority of the respondent's equivalent to 72.5% were in agreement that EE has to a large or moderate extent enhanced their knowledge and skills in environmental matters.65.1% of the respondents indicated that EE had to a large extent or moderate extent improved their ability to understand their surroundings. A large extent of 94.0% agreed that EE has had positive effect on them. 55.1% of the respondents indicated that EE has enabled them participate in conservation activities while 62% conceded that they are currently involved in conservation activities. This concluded that EE has had the desired effects to some extent. The results will be useful to policy makers, curriculum developers, conservationists and other stake holders while making decisions on conservation and sustainable development for future generations. Overall, the study concluded that to some extent EE has had some positive impact on the respondents but much more needs to done to bridge the existing gaps.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Environmental problems have tremendously increased at the global, regional and local levels during the last few decades. Issues related to environmental problems have become a major concern for the international community particularly for educational policy makers and curriculum developers. Several measures and strategies have been considered for intervention. Among these is the use of school curriculum to create public awareness on the need for environmental preservation and protection.

According to the National Project for Excellence, "environmental education is a process that aims to develop an environmentally literate citizenry that can compete in our global economy, has the skills, knowledge, and inclinations to make well informed choices, and exercises the rights and responsibilities of members of a community".

A professionally executed environmental education is a comprehensive process to help people understand the environment, their place in it, environmental problems and related issues (Talero, 2004). Today's educators are convinced that research in pupils understanding of many aspects of environmental issues will be valuable to teachers so as to teach pupils more effectively by taking the research findings into account. It may therefore necessitate an in-depth evaluation of the course curricular of any environmental education program. When the developed countries curricula are examined it is seen that environment based concepts are included in these contexts. But it is impossible to say the same for underdeveloped and developing countries.

Though there is increased public awareness on environmental issues, lack of adequate environmental knowledge can be a big obstacle towards achieving sustainable future for mankind at both international and local levels (Carnvale and Schulz, 1990).We need proper education and awareness campaigns on the importance of environmental health which is in the enhancement of the protection and well use of natural resources for a sustainable future.

Environmental Education (E.E.) involves a structured and planned process seeking implementation of an environmental curriculum at all levels our educational system. The urgent need to educate humankind on conservation and sustainable uses of natural resources through E.E. is today agreed upon as a world wide necessity. EE gained momentum at the UN conference in Stockholm in 1972 and at the first UN earth summit in Rio de Janeiro on environment and development agenda 21. This obliged all the signatory countries to incorporate EE in their educational curriculum at all levels given that environmental hazards do not respect national boundaries and cross frontier pollution is a reality.

According to the UNESCO goal, all pupils should receive EE to help them gain knowledge, attitude, capability and behaviour towards conservation (Talero, 2004). Many countries and states have taken this initiative best examples being countries in Latin America, central Florida, Australia, Canada, and Spain among others.

In Africa, efforts have also been made to embrace EE evaluation through partnerships between governments, NGOs, private businesses and educational entities. Countries like South Africa, Uganda, Swaziland, among others have made some progress towards this end. However, much more needs to be done above the current efforts. For example in the USA, a bleak picture is painted on the state of education evaluation (Carnvale and Schulz, 1990).

Since the introduction of the 8-4-4- system of education in 1984, EE was integrated at all levels of the educational system including Teachers Training Colleges. In deed, the greater majority of Kenyans access primary education which is also a terminal level for many hence the need for this research report to determine whether we are indeed laying the proper foundation for EE and awareness. The use of the print and electronic media should also be considered seriously alongside the school curriculum in the transmission of EE in Kenya. Scientific groups, Journalists, and NGOs should also play a vital role in this process.

Local traditional knowledge should be exploited to the maximum in the application of sustainable management of the environment at community level. The threats of environmental disasters are real in Kenya today than ever before. This includes degradation

of our water towers like the Mau, the depletion and pollution of our lakes and rivers, diminishing wetlands and natural grasslands, erosion, among others. Therefore the need for this research report and many more like this one cannot be over emphasised. This will help us maintain the dignity of our environment and also join the international community in fighting the causes of global warming and climate change as emphasised in the recent earth summit in Copenhagen. EE is useless if it is non functional in the practical use of knowledge and information (Talero, 2004).

1.2 Statement of the problem

Environmental Education and Evaluation should be a vital component of our school curriculum as away of investing in our youth so that they can be capable custodians of our environment for the sake of conservation and sustainability. The youth have great potential which can only be ignored at our nation's peril. Given that the environment is our greatest heritage, all measures including EE evaluation must be taken to ensure that our youth have the correct attitude towards the environment since our very survival depends on this. Evaluation of an educational course is a key component of any systematic approach to education (Sloman, 1994). EE has been in the education system for several years which are adequate time for the effects to be realised (Kirkpatric, 1976).

Therefore, the purpose of this study was to determine the influence of Environmental Education on conservation among Secondary school students. The findings of this research will help our policy makers and curriculum developers to re-focus on any assumptions that may have persisted in the past and are not in tandem with environmental conservation. The results will also help in correcting past mistakes that have been committed on our environment.

1.3 Purpose of the study

The purpose of this study was to explore the effects of environmental education among Secondary school students and determine if this education has had the desired outcome towards conservation of the environment.

1.4 Research objectives.

The objectives of the study are:

1. To investigate the status of EE and evaluation among Secondary School students
2. To find out lessons learnt from previous EE Evaluation.
3. To identify the various sources of information on EE for the youth.
4. To investigate the challenges that exist in EE and evaluation on how to bridge the gap.

1.5 Research questions

The study seeks to answer the following questions:

1. What is the status of EE among Secondary school students?
2. which lessons can be learnt from past research in EE evaluation?
3. What are the various sources of EE and Awareness?
4. How can the gaps that exist in EE and evaluation be bridged?

1.6 Significance of the study

The findings of this study will be useful because of the urgent need to encourage change in behaviour and attitude in regard to the environment. It will also help people to appreciate and enjoy the world around them (Palmer, 1997). Policy makers would also benefit from the findings by acquiring the knowledge to help them adopt necessary environmentally friendly polices and approaches.

From the research, teachers will know the type of learning experiences that help to develop active and informed minds to help pupils and students understand, appreciate and care for the environment. The government through the ministries of Education and Environment, curriculum developers and implementers will also be able to identify the shortcomings of EE at this level with a view of rectifying the situation including the fixing of existing assumptions.

1.7 Scope of the Study

The study focused on secondary school students in Nakuru town Municipality who joined the schools between the years 2007 and 2010 .These students are currently in forms one, two, three, and four.

1.8 Limitations of the study

It is clear that, not all post-primary school leavers after KCPE end up in secondary schools. This will deny the research findings the input of those post primary school leavers who end up elsewhere due to the fact that it is not easy to track them down to be part of the respondents. Random sampling attracted sampling error that the researcher was not fully in control of given that a random sample is never exactly the same as the population. The geographical expanse of the study area, inadequate financial resources and time constraints also reduced the chances of contacting more respondents.

These limitations were mitigated by making sure that, there was purposive sample selection, piloting and careful scrutiny of the perceived parameters of measurement in the target schools, population and sample. Questionnaire method and interviews with the Secondary school students helped to attain maximum information with the ultimate aim of reducing financial and time constraints.

1.9 Delimitation of the Study

The study was bound to have a reasonable degree of success because the population and the sample are readily available in secondary schools. The use of the SPSS programme in analysing the collected data was helpful in making reasonable deductions. Some of the conservation activities connected with EE and Environmental Awareness were qualitatively observed in the secondary schools settings and appropriate records made. The researcher also got maximum cooperation from the relevant authorities and students given the current growing concern and sensitivity on environmental issues. Finally, the researcher worked closely with the supervisor at every stage to benefit from all the comments and advice towards the success of this endeavour.

1.10 Assumptions of the study

The researcher expected the entire exercise to move on smoothly relying on the maximum cooperation of all those involved. That the sample properly represented the population, the data collection instruments had validity and measured the desired parameters and that the respondents truthfully and correctly answered questions.

1.11 Definitions of Significant Terms

Evaluation	An assessment.
Effects	The changes that have occurred as a result of Environmental Education.
Environmental Education	Knowledge and awareness about the environment.
Conservation	Preservation or restoration of the natural Environment and Wildlife.
Post –Primary	After primary school education.
Global	In relation to the whole world or Universal.
Pollution	Contamination with harmful or poisonous substances.
Youth	Young people in primary and secondary Schools respectively.
Awareness	Having knowledge or perception in Environmental Education.
Curriculum	Subjects that make up a course of study in Schools or colleges.
Sustainability	Avoiding depletion of natural resources.
Signatory	A party that have signed an agreement.
Cross Frontier Pollution	Pollution across national and international boundaries.
Depletion	To consume, drain, empty or exhaust.
Biodiversity	Range of organisms in the environment.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter consists of a review of the relevant literature to the study. It begins with a critical presentation of research findings on the state of evaluation in Environmental Education (E.E.) and awareness in Norway, Malta, Latin America, Denmark, India, Costa Rica, Slovenia, Australia, Swaziland, South Africa, Uganda and Kenya.

2.2 Background to the Review

Environment has become a very popular area in the last three decades. EE is supposed to play a great role on urgent environmental issues such as ozone depletion, green house effect, acid rain, global warming, air-water pollution and fossil fuel combustion. Environmental problems are due to a combination of several factors. These factors cause both environmental and health problems. The chemical materials and processes are the most important among these. In addition, the exceeded using of fossil fuels (coal, oil, and natural gas) causes several environmental problems. Noticing the bad effects of chemistry and traditional energy sources on environment and human life, environmentalists are trying to find solutions for a better life (Ray, 1999). For this, teaching about environment issues and the preservation of the world's environment has become increasingly important across the globe. Those efforts show the importance of humans' awareness about these problems in taking precautions. This awareness should be recognised by all countries for the sake of next generations.

During the last few decades the trend for environmental protection has expanded in various areas including education. If people are aware of the need for and the ways of protecting the environment they will act to preserve it (Gaudie, 1993). Schools should assume responsibility for educating about environmental protection and environmental education can be effective as part of a school curriculum. Increased concern about the environment has paralleled the development of EE in the world. With this regard, both developed and developing countries have taken this reality into consideration in designing curricular for all schools. The

evaluation of EE helps in adding value to the programme through research reports (Cooper and Palmer, 1992).

2.3 Current Patterns in Environmental Education Evaluation Research

Studies in this area have shown a rapidly increasing global research base in EE. Various models of evaluation have been developed that define the parameters of an evaluation; what concepts to study, processes and methods that may be used. The most commonly used approaches in the design of education evaluation have their roots in systematic approaches to the design of education. They are illustrated by the Instructional System Development (ISD) methodologies, which emerged in the USA in the 1950s and 1960s and are represented in the works of (Gagne and Biggs, 1974) and (Goldstein, 1993).

There are six approaches to education evaluation (Bramley, 1991; Worthen and Sanders, 1987) namely: Responsive evaluation, Professional view, Goal free evaluation, System evaluation, Goal based evaluation and Quasi-legal. Under the goal based approach, the most influential framework has come from Kirkpatrick (Carnevale and Schulz, 1990; Gordon, 1991; Philips, 1991). The Kirkpatrick's model (1959) is based on four levels that is, reaction, learning, behaviour and results .Indeed the Kirkpatrick's model has helped focus education evaluation practice on outcomes (Newstrom,1995).The model has also done well in the training of evaluators and has been the base upon which other evaluation models have emerged.

Research in this area gained momentum in USA in the 1970s and 1980s.This endeavour was rooted in the scientific research paradigm which sought to apply quantitative methodologies in the identification, prediction and control of the variables that are to be the critical cognitive affective determinants of responsible environmental behaviour (Alliger, 1989). It would seem that two decades after positivism and the quantitative tradition steered the definition and development of a research base for EE, their characteristics continue to be dominant in the research literature today. However, the field is dynamic and increasingly influential. Many more environmental educationists are developing a research perspective in their work, and more researchers are working full-time in the field than ever before.

Along with this trend is an ever- widening range of themes pursued by researchers with increasing emphasis being placed on the links between empirical research and the improvement of practise. The range of methodologies and approaches to research is slowly but surely broadening to take account of the all-important social context of the increasing qualitative and interpretative research studies appear to be based on methodologies that are either lacking in rigour or too poorly articulated, which raise serious questions relating to reliability and validity. A great deal needs to be done in qualitative research base in terms of broadening the research base and critically appraising the role of research.

2.4 General view of Evaluation on Environmental Education

Evaluation usually emphasises on the outcomes, impact and on learning for future broader policy purposes beyond the particular project or program being assessed (Roche, 1999).Despite its importance, there is evidence that evaluation of educational programmes are often inconsistent or missing (Carnevale 1990; Holcomb, 1993; McMahon and Carter, 1990).

In Norway, considerable efforts have been made on developing a national EE evaluation policy. However the Norwegian polices and initiatives cannot be perfectly applied to other countries but various adjustments can be made to fit in local circumstances. EE in Norway has been based on four important concepts of commitment, competence, cooperation and curriculum. The main focus is that all pupils should receive EE in accordance with UNESCO goals including knowledge, attitudes, capabilities and behaviour (Benedict, 1999). A large number of researchers, teachers and other organizations were involved in developing this strategy, which went through various stages of revision and is currently being periodically reviewed. Thus the Ministry of Education itself has taken a leading role in initiating change that has been recommended by various evaluation reports on EE in Norway. A substantial budget was allocated to this task. The goals of Norwegian strategy were oriented towards the system as a whole, not as individual schools or programme (Benedict, 1999).

The following lessons are learnt From Benedict's study; Shortcuts do not work and the implementation of EE within the framework of an educational system that isn't made for it may succeed in the classroom for a short time but these efforts are usually not sustainable. The process requires patience, goodwill and commitment of all concerned. Teachers cannot

succeed without support from the higher levels and the Ministry of Education cannot do well in conducting EE development without full support from teachers. The process of bringing out the desired changes from EE is along term process which requires more than short term in-service training courses for teachers. This can be done through proper communication between the ministry of Education and all other stakeholders.

In Denmark, the debate on EE evaluation is characterised by a lack of clarity concerning the two concepts 'action' and 'behaviour'.(Kollmuss and Agyeman,2002) defined 'pro-environmental behaviour' as the sort of behaviour 'that consciously seeks to minimize the negative impact of one's actions on the natural and built world ...' Research within the Research Programme for Environmental Education at the Danish University of Education has over a period of ten years approached the subject of EE through what is known as the action competence approach' (Jensen & Schnack, 1997; Jensen et al., 2000).

Secondly, in order for EE activities to be characterised as actions, they must be targeted at effecting real change regarding the environmental problem that is being worked on. To sum up, an action should be directed at solving a problem and it should be decided upon by those preparing to carry out the action (Larsen, 1998). In other words, an action is targeted at a change: a change in one's own lifestyle, in the school, in the local or in global society. This approach implies that action in EE embraces indirect as well as direct actions (UNESCO, 1977). In addition to this, actions might be individual as well as collective. In a school context, actions carried out as integrated parts of teaching will often be collective. The overall conclusion of the EE evaluation is that the many changes experienced suggest that the schools and pupils do actually have possibilities for acting as a catalyst for environmental changes in the local community (Schmidt, 1999).

To summarise, the concept of pro-environmental behaviour—even when deemed in action terms exhibits several problematic aspects. These include: marginalisation of indirect environmental action; restriction of action and behaviour to individuals; and an assumption that today's complex environmental problems can be tackled through unambiguous means. This EE project illustrates that this theoretical framework is too narrow and out of tune with both the complexity of contemporary environmental problems and an educational tradition

based on action and democracy aimed at educating students to become critical and active citizens.

Based on this and numerous other example drawn from both environmental and health education, a more open concept of action is needed, which covers more than the concept of pro-environmental behaviour. Based on several studies, (Kollmus and Agyeman, 2002) concludes that there is no apparent correlation between knowledge and pro-environmental behaviour. The longer the education the more extensive is the knowledge about environmental issues. Yet more EE does not necessarily mean increased pro-environmental behaviour. Studies conducted support the conclusion that environmental knowledge per se is not a prerequisite for pro-environmental behaviour (Kempton, Boster and Hartley 1995). In their discussion, they argue that it might be fruitful to distinguish between different levels of knowledge, yet without specifying in any detail what these levels might involve. Elsewhere, other studies have shown that very detailed technical knowledge does not seem to foster pro-environmental behaviour.

2.5 Knowledge, Action and Pro-environmental Behaviour

Knowledge should still be acknowledged since it contributes to the development of competence leading to action and behavioural adjustments in relation to the environment. The fact that knowledge does not per se lead to action and behavioural change is due to a number of factors that include; Traditional knowledge about the environment as it is taught in school is not in essence action oriented. EE at school has traditionally focused on passing on knowledge to pupils, who have thus not been afforded the possibility of actively appropriating and internalising that knowledge (Larsen, 1998).

We are, therefore, confronted with the question of which forms of knowledge might further the development of pupils' competence for taking action and effecting behavioural change in relation to the environment, as well as the ways in which students may actively acquire this knowledge. These two requirements are often - perceived as being irreconcilable: how can one involve students in the process as active participants on the one hand, while at the same time ensuring that the knowledge they acquire is action oriented?

Instead, it has to be re-thought from an action perspective. The Danish psychologist (Larsen 1998), argues for the necessity of the professional experienced teacher, being in natural

control of the substance. And what does that mean? That means that the content substance is controlled at a level such that it becomes an integral part of the teacher's personality, so he does not need to use attention and resources on the professional side but can concentrate all his energy on choreographing the educational process (Larsen, 1998). We are naturally left with the question of what this 'substance' should comprise.

If the main goal of environmental education is the development of the student's ability to act and effect change, it follows that associated knowledge and insight should in essence be action oriented. This has significant consequences for the kind of knowledge that will be the focus of planning, implementing and evaluating teaching and learning in environmental education. The basic pedagogical considerations at the heart of the approach outlined here are:

i. Environmental issues in our societies are influenced by living conditions as well as life-style choices.

ii. Solutions to environmental problems must be sought at both the structural/ societal level of living conditions as well at a personal/life style level. If individuals are to contribute to the solutions, they have to be able to identify both personal and structural causes, and develop their own visions and abilities to influence and change these conditions.

iii. As institutions for general education, schools have a responsibility to help equip the members of society in their charge, their students, with the knowledge and commitment to take personally meaningful decisions and actions to address the challenges posed by both lifestyle and societal conditions.

iv. Consequently, the overall aim of EE at school is to develop the abilities of students to act at the personal and societal levels, that is, to increase their action Competence.

These considerations lead to a concept of action competence as the overall aim for environmental education. However, the aim of changing pupils' behaviour in a pre-determined direction implicitly builds on some questionable assumptions. The model proposed by Kollmuss and Agyeman aims at summarising the studies and discussions reviewed in their article. And it does so in a very elegant and simple way. Nevertheless, the above discussion gives rise to a number of comments on the model: It should be reconsidered whether pro-environmental behaviour/direct action can profitably be put up as the 'be-all and

end-all' of the model. If the underlying assumption is that environmental problems are structurally anchored in society, an adequate concept of action must encompass both direct and indirect action of competence developed in the Danish context. If environmental problems are fundamentally viewed as 'open social questions', it might be pertinent to include people's 'visions' and 'critical thinking skills' in 'environmental consciousness'. The model does not distinguish between individual and collective action, which is a fundamental distinction concerning action-oriented approaches in EE at school.

2.6 Growing Awareness on Environmental Education and Evaluation

In the case of Malta, elementally school curricular are fragmented and mono-disciplinary, making inter-disciplinary learning hard to apply (Pace, 1997). Even though environmental topics have become more relevant in recent years in secondary schools, it is also fragmentary. Though EE is not a national Maltese priority, at least there is a growing awareness phase by government and other organizations where the need to incorporate environmental topics in to their educational system is being recognised. Different organizations have included EE in their agendas. However, they have been forced to work in an uncoordinated manner because of lack of support and organization.

In May 1995 the education division, the Environmental Secretariat, the Faculty of Education and some NGOs jointly organised the second National Training Workshop on EE in order to improve the situation in Malta (Pace, 1997).This was aimed at bringing all stakeholders on board to become aware of the state of EE in the region. Although Malta is far from having a national EE strategy, the country has at least recognised the need to incorporate EE in the national education curriculum.

In Costa Rica, research showed that youth hood and childhood bears the most important memories in a person's life. Most adults retain and unconsciously use information starting from upbringing experiences. It is during this early stage where personality begins to take form. Almost everything that children learn is provided in different ways by the outside world. The natural environment is a significant component in this learning process .Children are very emotional and sensitive about everything they learn. They can easily be attracted or repelled by any topic. EE must not be presented to them with a sense of doom or disaster so they don't avoid or dislike it. If they feel the natural world is a universe of problems they

might not want to deal with it at all. Children should be given a Chance to bond with the natural world before they are asked to heal it.

Kids learn better when they focus first on local issues and globalize after. Local environment should be the basis for curricula with six through nine year olds. Only after they are able to think in an analytical manner can they learn in a global way (Sobel, 1995). EE and community conservation needs should be viewed in a continuous and progressive perspective. A study conducted during a 4-week period in the town of Quebrada Ganado, Costa Rica by (Vaughan et al., 2003), revealed that if EE programs for children are guided in a proper way, parents and other adults could also benefit from them. Knowledge gain passed on from children to parents (and other adults) indicates that awareness can be delivered in a consecutive way from the classroom to the community.

2.7 Environmentalism in Latin America and Other Developing Areas

Latin America is very rich in terms of species and ecosystem diversity. Similarly environmentalism in the region is also highly diverse. It is virtually impossible to generalize a Situation when each and every country is very different in issues like political stability, economic and social development and even education (Christen et al., 1998).

In Venezuela, different groups often have distinct views and positions regarding EE. With a lower incidence, Costa Rica has experienced similar conflicts between popular and elitist organizations while In Mexico even the elitist groups see effectiveness in conservation when local economic interests are included in the agendas. In Brazil environmental organizations conflict amid anthropocentrism and biocentrism as they deal with an inefficient and corrupt system (Gutierrez and Teresa, 1994). Many external and internal factors shape the work done by diverse environmental organizations and institutions. Local environmentalists recognize the not always positive influence of alien funding on regional needs. International organizations don't always recognize that different cultural solutions may be applicable for the same problem in other ways.

Local leaders are not always concerned with environmental issues, even if they are "environmentally aware". Their political agendas are saturated with political problems like employment, national security, economic development, poverty and development.

Government and non-government institutions have different perspectives on environmental issues and they frequently work in an uncoordinated and self-guided manner. Also, their different educational levels and their sources of funding influence the goals of their agendas. These factors contribute to the diversity of the EE movement in Latin America .In the case of Mexico and other developing countries the application of ecological solutions to local problems has encountered some obstacles.

The most significant ones include the rather new growth of ecology, the comparatively low numbers of well-trained environmental professionals and the ways environmental awareness is being communicated. Ecological information is not being delivered properly to the public mainly because of the above-mentioned barriers. Ecological knowledge without proper communication approaches is next to meaningless when sustainable solutions need to include public involvement (Sobel, 1995). The establishment of crossing points between science, management and communications is a must since the goals of sustainability should benefit all stakeholders, and most importantly the public. The goal is to ease the access, distribution and application of knowledge at all social levels. Environmental education is useless if it cannot be functional.

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EE should be used as a linkage system. In developing countries environmental organizations and institutions should include means that facilitate the practical use of knowledge and information. This only works by applying a systems (or cross-cutting) perspective that encourages collaborative perspectives among all the different stakeholders, including the use of well-designed awareness campaigns. In Latin America there is awareness of the immediate need to find solutions to various aspects of the environmental crisis. It has also been recognized, just like in many other parts of the globe that environmental problems require the integration of ecological science with social issues. Local traditional knowledge is very useful when it comes to applying sustainable management strategies at a community level.

A study carried out to evaluate conservation programmes at a South American zoo noted that zoos can play an important role in environmental programs. (Gutierrez and Teresa 1994) examined the effectiveness of conservation programmes at a zoological park in Cali, Colombia and came to the conclusion that simple exposure to wild animals is not enough to

obtain effective environmental awareness in elementary school children. Better cognitive achievement results can be gained when zoos support educational programs by involving teacher participation and emphasis on practical activities. The study also pointed out that knowledge of students whose teachers took part in the educational programmes improved considerably. Student's performance was greatly enhanced by adequate preparation and reinforcement of wildlife conservation information, as well as by active participation. Results obtained from this report are being used to develop new educational campaigns for children in Colombian zoos.

2.8 Environmental Education and Evaluation in the School System

India has been experiencing immense environmental damage due to alarming on-going population explosion, rapid movement towards urbanization and industrialization, increasing needs of energy and fast scientific and technological advancement that cannot be reversed unless there is collective thinking, will and effort. These calls for public education, awareness and participation for bringing about an attitudinal change and finally restricting further damage to the environment (Herremans et al., 2002). Effective implementation of EE, management and conservation programmes depends on education, awareness raising, training in the relevant areas and evaluation (Awsathi and Sebastian, 1996). Without an understanding of how to conserve natural resources and the compelling need to do so, few people would be motivated to participate actively in programmes on environmental conservation, EE, Evaluation and awareness thus assume critical importance (Morell, 1998). The 'EE, Awareness and Training' is an important scheme of the Indian government for enhancing the understanding of people at all levels about the relationship between human beings and the environment and to develop capabilities/skills to improve and protect the environment. In this regard India has taken several steps aimed at promoting EE.

Though formal education in India is the mandate of the Ministry of Human Resource Development (MHRD), the Ministry of Environment & Forests has been interacting with the MHRD, NCERT, and State Departments of Education among others to ensure that environmental components are adequately covered at the school levels by infusion of EE into the school curricula at various levels. The major initiatives taken by the Ministry in this direction recently are mentioned below:

Under this project, which was initiated in 1999, an exercise to strengthen EE in the formal school curriculum has been undertaken. During the first phase of this project, a comprehensive study was conducted to assess the status of infusion of environment content in the school curriculum in the country and to assess the effectiveness of classroom teaching (Morell, 1998). The study was conducted in all the States of the country and textbooks of all the classes from standards I to XII were analysed. Based on the findings of the study, the textbooks in Science, Social Science and Languages of middle school level in eight States (100 schools in each State) are being modified to strengthen the infusion of environmental concepts. The modified textbooks were used for one academic session (2002-2003) in the selected schools of the selected States on pilot basis. The concerned teachers of the selected schools would also be trained to effectively teach the modified textbooks. The States participating in this project are Andhra Pradesh, Assam, Goat, Jammu and Kashmir, Maharashtra, Orissa, Punjab and Uttaranchal. Depending upon the success of the pilot implementation, the revised curriculum may be taken up in the remaining schools (Sanders and Cunningham,1974). The findings of the Phase I study are also being shared with the States which are not participating in this project so that they can also environmentalise their textbooks.

Though there are several courses on environmental sciences at present in the formal system, there are no structured courses available outside the formal system for people who desire to learn about environmental issues. The Ministry has taken an initiative in this regard and it presently working out a frame work for environmental appreciation courses in consultation with IGNOU.

Realising that the industry Managers and leaders need to be sensitized towards environmental issues and concepts of Environmental Management so that they can play an important role in introducing environmentally sound practices in their operations, the Ministry has taken an initiative to introduce/enhance environmental concepts in the Business/Management Education. A committee comprising representatives from Management Institutions, Industry and MoEF is already looking into various aspects like course content and syllabi of the existing courses so that gaps could be identified and suggestion could be given for enhancing/introducing the environmental content where necessary.

Environmental Education, Awareness, Evaluation and Training plays a significant role in encouraging and enhancing people's participation in activities aimed at conservation, protection and management of the environment, essential for achieving sustainable development (Bakshi and Naveh 1980). The Ministry, therefore, accords priority for the promotion of non-formal EE and creation of awareness among all sections of the society through diverse activities using traditional and modern media of communication. Some of the major activities undertaken in this regard are as follows:

The National Environment Awareness Campaign (NEAC) was launched in mid 1986 with the objective of creating environmental awareness at the national level. It is a multi-media campaign which utilises conventional and non-conventional methods of communication for disseminating environmental messages to a wide range of target groups (Detjen, 1995). Under this campaign, nominal financial assistance is provided to registered NGOs, schools, colleges, universities, research institutions, women and youth organisations, army units, State Government Departments among others from all over the country for organising/ conducting awareness raising activities. These activities which include seminars, workshops, training programmes, camps, rallies, public meetings, exhibitions, essay/debate/painting/poster competitions, folk dances and songs, street theatre, puppet shows, preparation and distribution of EE resource materials which are followed by action like plantation of trees, management of household waste, cleaning of water bodies among others. Diverse target groups encompassing students, youth, teachers, farmers, other rural population, professionals and the general public are covered under NEAC (Christen et al, 1998). The programme is being implemented through 28 designated Regional Resource Agencies (RRAs) for specific states/regions of the country. The applications for participation in this programme are invited every year through advertisement in major national and regional newspapers during the months of May/June. Any additional information can be obtained from the concerned regional resource agency.

Eco-clubs (National Green Corps) are used to educate children about their immediate environment and impart knowledge about the eco-systems, their inter-dependence and their need for survival, through visits and demonstrations and to mobilise youngsters by instilling in them the spirit of scientific inquiry into environmental problems and involving them in the efforts of environmental preservation. Since the modification of the scheme in 1993, more

than 10,000 Eco-clubs had been provided grants until 2000-2001 in various parts of the country. Considering that the total number of schools covered was grossly inadequate compared to the total number of schools in the country and keeping in view the potential of this programme in sensitizing the school students, it was decided to intensify this programme to cover each and every district of the country (Detjen, 1995). A programme of raising 'National Green Corps' through the Eco clubs was therefore, launched during 2001-2002. Under this programme, Eco-clubs are being set up in 100 schools of each District of the country. 47,000 Eco-clubs have been set up so far in the country. This programme is being implemented in each State through the Nodal agency appointed by the State Govt. The Government of India provides financial assistance for establishment of Eco clubs @ Rs.1000 per Eco-club, training of Master Trainers, teacher training and distribution of resource materials.

Global Learning and Observations to Benefit the Environment (GLOBE) is an International Science and Education Programme, which stress on hands-on participatory approach. India joined this programme in August, 2000. This programme, which unites students, teachers and scientists all over the world, is aimed at school children. The students of GLOBE schools are required to collect data about various basic environmental parameters under the supervision of a GLOBE trained teacher and use it for explaining hypothesis as well as to enhance their scientific understanding of the earth. This data is also used by the scientists in their research work. The GLOBE also provides an opportunity to the students to interact not only with the GLOBE scientists but also with the students from GLOBE schools in other parts of the world. About 100 schools spread over different parts of the country have already joined this programme. The teachers of these schools have also been trained in various GLOBE protocols (Hopkins, 1995). An International training workshop for trainers was successfully organised at New Delhi in January, 2002. The participants at this workshop, which included representatives from Nepal and Thailand besides India, were trained in Basic and Advanced GLOBE Protocols by a training team from GLOBE Headquarters in USA.

Despite great efforts to spread environmental awareness by the Ministry through several schemes, it is felt that a large population especially in rural areas is still left out (Green Cross,2004) The best way to reach out to them and make them aware of the environmental problems is through media, particularly the electronic media (Thomson,2002). "Mass

Awareness" has therefore been identified as one of the thrust areas of the Ministry, not only to intensify the efforts already being made in this direction but also to launch new initiatives (Filho, 1995).The Doordarshan and few other television channels are proposed to be extensively used for telecasting environment based programmes. Professional Media agencies which are hired to assist the Ministry in carrying out the campaign also play a major role (Tyson, 2005). To encourage individual efforts in producing films/documentaries on environment / wildlife related themes in the country, the Ministry has sponsored organisation of a film festival "Vatavaran – 2001" by Centre for Media Studies, Delhi in April 2002.

The Ministry also sponsors various Other Awareness Programs which do not fit into straitjacketed programs like NEAC, and are aimed at creating environmental awareness among children. These include environment quiz (both written as well as televised), organization of activities for observation of special occasions such as earth day and special programs for children, These proposals which are received throughout the year from various NGOs and other agencies, are considered on merit as and when received and are supported. A few examples of such programs are: An international written Environment Quiz program known as Green Olympiad. It is conducted in more than 200 centres across the country. Last year the quiz was conducted in both Hindi and English and more than 70,000 school students from India, Russia and UAE participated in this competition. The regional winners were selected for a televised quiz program which was telecast on National channel of Doordarshan. It was a great success in sensitizing the children about environmental issues. Awareness activities and events by NGOs and academic institutions on the occasion of special Environment days like Earth Day. Written environmental quiz programs in different regional languages are being started. The winners of written quiz would participate in a televised quiz program. Organization of an annual Vacation Program on Environmental Resources for high school level students namely "Vacation program on Natural resources- building a broader constituency of support for conservation."

2.9 Environmental Awareness among the vulnerable in Swaziland

In an attempt to promote EE and awareness in Swaziland, Nkosi (2002) carried out a community oriented education programme on biological diversity, conservation and sustainability. It emphasized the need for a public education program. This program was intended to be seen as an investment in the people by teaching them a self-regulating culture

that would help raise awareness of the role biodiversity and conservation can play in sustainable development among the most vulnerable communities in the developing world.

In yet another study on EE and Sustainability in most vulnerable communities, (Madduma, 1989), examines the need to increase awareness of the interactions between human activity and environmental change based on the Human Dimension of Global Change Programme (HDGC) perspective. In addition to that, the whole issue is referred to various international conferences (UNEP, Tbilisi and UNESCO) regarding the impacts global EE and evaluation has on the poorest and weaker groups in developing countries. This reading also talks about the target groups for these educational initiatives but also realises the continuing need to reach out to the unconverted groups in most developing countries (UNESCO, 1980).

Although international EE has a global perspective, the author identifies special" target groups with special problems. Mainly populations in rural areas form these groups. Most people in these zones are among the poorest and most ill educated on the planet. They are subject to numerous factors that don't facilitate the implementation of sustainable management plans, factors that relate to simple survival needs, which are more important to their lives than environmental concerns. Environmental awareness in vulnerable communities in developing countries can be improved through both formal and non-formal education. Mass media, art, and traditional knowledge, are elements that can greatly contribute to the encouragement of environmental awareness in developing countries. Experience has shown that NGOs can be very effective in promoting environmental awareness in poor urban or rural based communities. However, experience has also shown it is undesirable and not convenient to by-pass government institutions regardless of how unsuccessful they are.

In a nutshell, studies on EE evaluation outside Kenya shows that considerable efforts are being made. From Canada there is evidence to support the notion that EE-related activity is thriving within elementary schools; in Spain the prospects are good for collective effort and achievements'; in Australia the prospects remain bright and teachers find a way of engaging in EE even in circumstances where this is against all odds (Palmer,1997). In Uganda there is a new National Environmental Education Strategy for the Formal Education Sector; in Slovenia it is envisaged that environmental education will form part of the national curricula

for all schools; in South Africa, there are recently introduced environmentally related requirements for teacher education, and so on.

2.10 The state of Environmental Education and Evaluation in Kenya

The appropriate use of evaluation as a management tool for EE is given in this section and also highlights of the benefits accrued from the use of evaluation. Secondly, it identifies some major challenges to the acceptance of evaluation in Africa and presents a case study based on the implementation of EE in Kenya to illustrate the impact of these challenges on the overall success of EE. Evaluation of any EE programme involves the systematic gathering and analysis of data on the programme and the activities undertaken (Abagi, 1995). It takes note of the progress as well as constraints that impact on implementation and assesses the achievement of the program's objectives (National Environmental Secretariat [NES], 1977). Evaluation of EE also appraises the overall performance towards the achievement of the goals and objectives. Therefore, evaluation should be seen as an integral element of management that helps to track implementation schedules and activities towards the fulfilment of EE aims and objectives (Abidha, 1987). This is in line with the general agreement that education is the systematic modification of behaviour through learning which occurs as a result of instruction, development and planned experience (Bass, 1966).

Most stakeholders in EE collect evaluation data that is relevant either by themselves or through collaborations. However, evaluation in EE remains yet to be purposeful, systematic and consistent (Kinyua and Murungi, 2002). This pertains to not only, routine gathering of data, but also its analysis and the feedback for planning reviews and management purposes. Firstly, knowledge of the functions of EE evaluation as a management tool is limited among stakeholders. Secondly, the lack of appreciation and reluctance to use evaluation systems is strong (Phillips, 1991). This emanates not only from lack of knowledge and negative experiences with previous EE evaluation activities but also from the misguided view that evaluation is a personal appraisal system that can threaten the status quo (Hopkins, 1995). This is a failure to accept the many functions and uses of evaluation. The main use of evaluation is to determine the real worth of any programme to help make vital decisions (Worthen, Sanders and Patric,1997).Other factors that work against evaluation systems in Africa include;

The culture of secrecy that is imbedded in the cultural history of the African people. This involves the fear of the unknown and consequent exposure of weaknesses which has persisted to date and is being realised even in the way public institutions and programmes are run including EE. Besides the culture of silence is the lack of political goodwill in African leadership. This leads to lack of integrating evaluation in policy making on matters of EE In an attempt of shunning criticism and weaknesses exposed by evaluation reports (Kinyua and Murungi, 2002)

2.11 Sensitization and Acceptance of Evaluation

The demand for Evaluation needs to be generated, specified and articulated by all stakeholders within any EE programme. In other words evaluation needs to be domesticated. (Atakara, 2000), citing (Boyle, 1997) and (Toulemonde, 1998) suggest three ways which are; sticks, carrots and sermons of generating and fostering demand for evaluation. The first one (sticks) is making evaluation mandatory or giving external stakeholders the right to ask evaluation questions. The second (carrot) is by ear marking funds for evaluation and giving recognition for evaluation efforts; sermons is by promoting a culture that values evaluation as a critical input in decision making by way of messages sent through conferences, training workshops, peer groups, network journals, among others. All three ways suggest the specification of evaluation in EE logical framework in a move towards institutionalization of evaluation right from the planning of EE programmes. This also suggests the sensitization of all the stakeholders on its importance and their roles in evaluation (UNESCO-UNEP, 1988). For example we have encountered programmes where evaluation has not been conducted and when called upon to conduct the summative evaluation the process was impeded by: Lack of baseline data to provide a benchmark for the evaluation; The lack of an elaborate logical framework for the program implementation and that monitoring and evaluation was not provided for in the planning and hence lack of budget for Evaluation.

In any development project or programme like Education, Health or Agriculture, we need to know where we are coming from and where we are going (Republic of Kenya, 1976). Therefore, Evaluation skills are crucial to the success of EE. As it is now, the concept of Evaluation as a project management tool is relatively new. The acceptability of Evaluation among the EE implementers has been slow and so has been the training in the area (Republic

of Kenya, 1977). Firstly, even where the donors demand evaluation, the programme implementers are handicapped in identifying the professional evaluators for lack of knowledge and skills in Evaluation. Secondly, the programme implementers lack perception on the appropriate function or benefits of Evaluation in a programme. They perceive the use of evaluation as a policing tool instead of a managerial tool. Thirdly, there is lack of institutional capacity in providing training in Evaluation. Fourthly, the lack of well established professional evaluation body to provide the code of ethics to guide practice of evaluation and to conduct meta-evaluations where necessary.

There has been a persistent use of the top-bottom approach to EE development, implementation and evaluation (NES,1982).The approach does not take into consideration the wishes of major stakeholders and therefore attempts to involve them in evaluation at the end of the EE programmes are met with disinterest and resistance. There is need to embrace the bottom up approach in EE planning, development and implementation for purpose of promoting acceptance and ownership. This by implication includes the involvement of all stakeholders in Monitoring and Evaluation to ensure the success and sustainability of the EE.

The Kenyan education system consists of four main divisions: Pre-school education, Primary school, Secondary education and Higher education. Investigations show that there has been an attempt to include EE at all these levels of education including TTCs. (Mironga, 2009).However not much seems to have been done in assessing the effectiveness or contribution of EE towards conservation. Given the serious environmental challenges Kenya is facing currently, this literature review intended to find out exactly how much has been done, the gaps left and how they can be bridged. When environment-related literature was investigated it was realised that there are several missing links between EE and the creation of Environmental Awareness especially among post-primary school pupils. Further investigations revealed that positive effects could only be realised through a well –designed curricula that include environment-based concepts because studies in literature review indicates that schools play an important role in the formation of children's positive attitudes towards the environment and that the formal education is most convenient for incorporating EE programs (Gall,M.,Bor,W.,and Gall,J.,1996).A combined study by both the ministry of

Environment and ministry of Education reveals that EE programmes in Kenya must be improved.

Chapters and units about the environment are widely placed in the current school textbooks and the teachers who teach EE feel limited because they are not trained to teach it. Therefore, teachers are failing to develop environmental literacy leading to the suggestion that EE should be taught as a distinct subject on its own. Teachers play an important role in teaching environmental-based concepts, but they can do even better despite the challenges if well trained. If pupils and students do not have the proper knowledge and understanding of causes and effects of environmental issues it will be hard for them to make correct decisions in the future to reduce and control such challenges. Thus EE is vital for the whole society and hence the need for an EE evaluation strategy given that knowing without application is not enough.

The Literature Review established that besides formal EE in Kenya, there are other programmes that promote EE such as the Green Belt movement and Eco-club. The later is an environmental education programme that was established by Eco-Ethics International Union –Kenya Chapter in 2002 in response to the principals of Agenda 21.This is a school based programme that organizes students or pupils into a club coordinated by a teacher who is the patron of the club to undertake environmental friendly activities in the school and the community where they live. The main goal of eco-club is to promote environmental education and action in schools and outside school with an aim of achieving sustainable development (Abidha, 1987).

Micro projects are important learning tools for schools and the neighbouring communities. Eco-Ethics International Kenya encourages schools to initiate small micro projects to address some of the environmental challenges in schools. The micro projects in schools are used to demonstrate best environmental practices and also used to localize curriculum in schools thus promoting understanding of class work. Schools are free to select the micro project based on the areas of Eco-club focus. Such micro project include: forestry, paper recycling and re-use and poultry farming among others. Eco-Ethics International Kenya in partnership with Kenya Organization for Environmental education (KOEE) and Foundation for Environmental Education (FEE) assesses/evaluates Eco-clubs in schools based on their green policies.

Schools with working green-policies graduate into an Eco-school and are awarded a green flag which is an international recognition that the school is environmentally friendly. The flag is a special honour which can help the schools to access environmental grants and in enhancing recognition networks. The school will be in possession of the flag as long as its practices are environmentally friendly. If the schools fail to observe good environmental practices after graduating, the green flag award shall be withdrawn. Eco-Ethics International Union - Kenya Chapter is a registered chapter of Eco-Ethics International Union, based in Germany.

The Kenya Organization of Environmental Education (KOEE) was a venture towards the Agenda 21- a global partnership to protect the dignity of the environment. KOEE's vision: An enlightened society that sustainably manages its resources and having improved livelihoods. Mission: To promote and re-orient environmental education towards sustainable development through appropriate and realistic national and regional programmes for people to actively participate in solving environmental problems. Motto: "Taking action - Safe Earth" (KOEE, 2010). Foundation for Environmental Education (FEE) is a non governmental, non-profit organisation promoting sustainable development through EE to improve the quality of life for the current generation without compromising that of future generations. It also provides leadership and encourages partnership in caring for the environment by inspiring, informing, and enabling nations and peoples.

In conclusion, there is an urgent need to appreciate the vital role played by EE in the management and conservation of the environment towards finding solutions to current and future environmental challenges like; soil erosion, desertification, salvaging catchment areas, protect the ozone layer, preserve our heritage, protect our natural sources of medicine, conserve the landscape, water resources, wildlife, and above all ensure enough food production and clean water for everybody. Therefore, EE and Evaluation is a vital process in providing the necessary feedback to all stakeholders including environmental agencies and processes like EMCA 1999, NEMA, BATNEEC, NEAP, EIA and the Greenbelt movement. The role of research in EE and its Evaluation cannot therefore be over emphasised since we are all living under Climatic fear (Jensen, 2002).

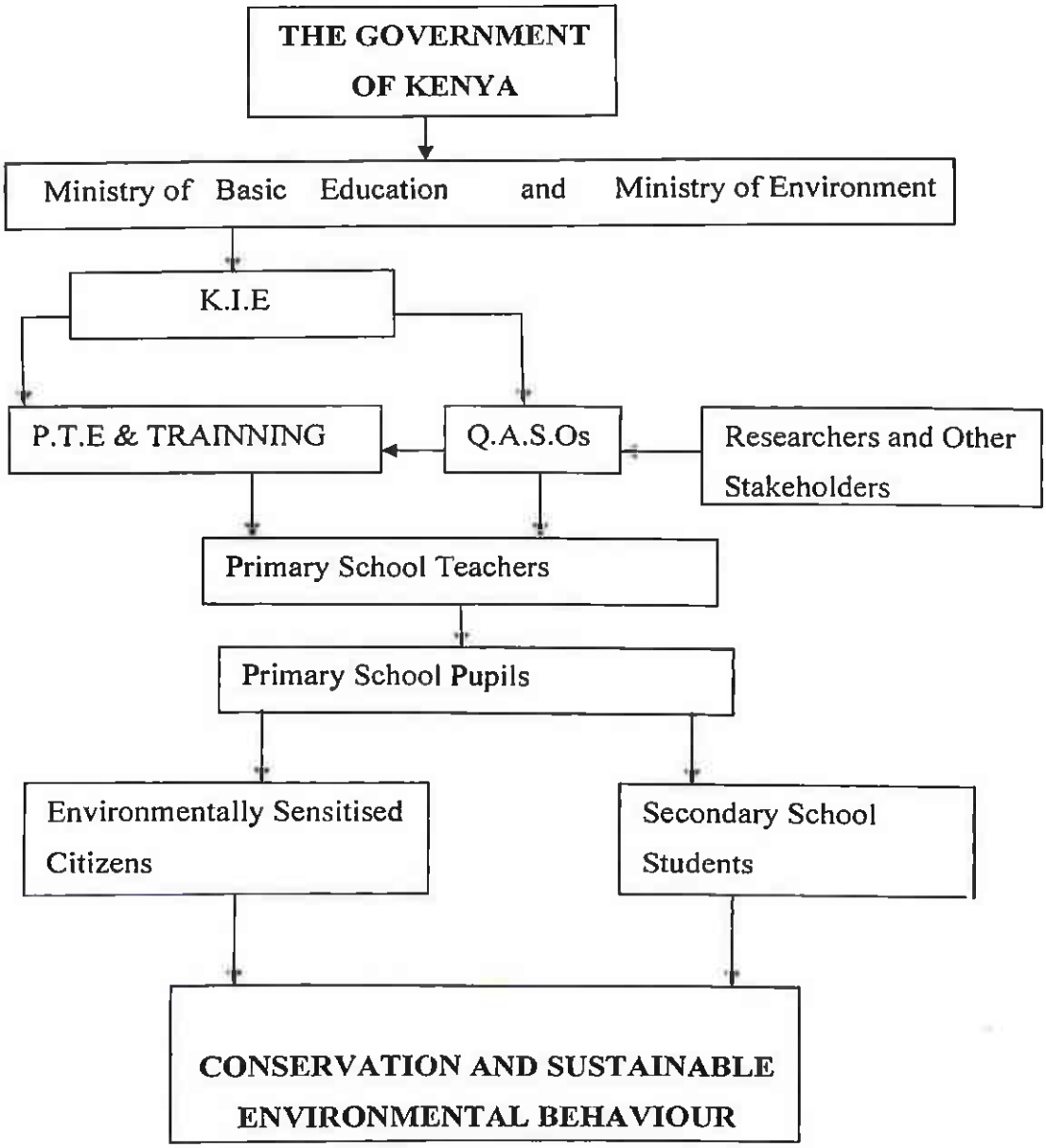

Figure 1: Organizational Structure of Environmental Education and Evaluation in Kenya.

In the organisational structure of EE and evaluation in Kenya (figure 1), Conservation is the dependent variable while EE is the independent variable. The Governments policy on conservation is implemented through the above organisational structure. This is illustrated in the conceptual framework in Figure 2 which represents the assumption that a well managed EE can lead to the desired effect of conservation and sustainable Environmental practices.

2.12 Conceptual Framework

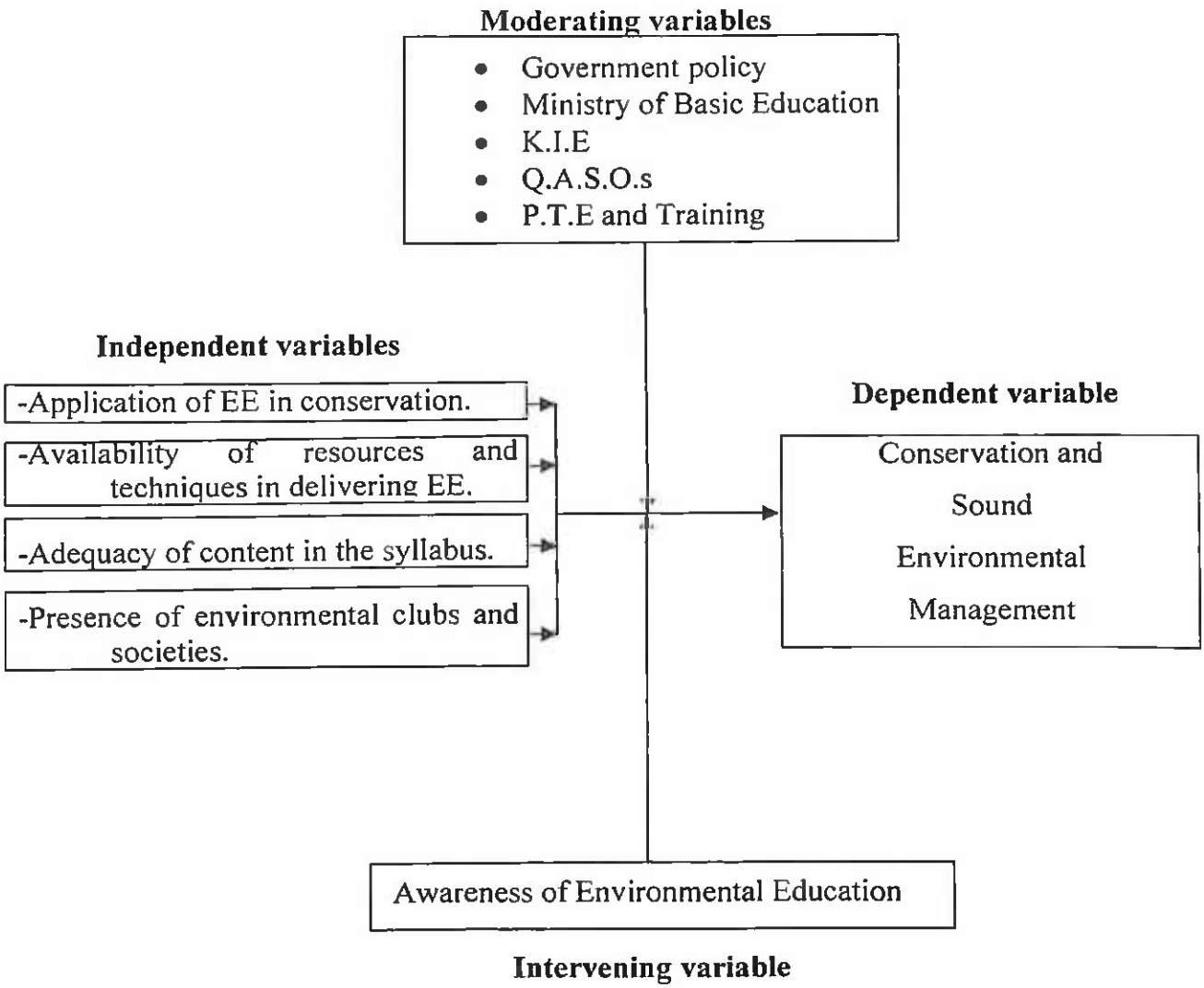

Figure 2: Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives the research design, population of the study, sampling procedure and sample size, data collection methods, data analysis, Reliability and Validity of instruments, Data collection instruments and the operational definition of variables.

3.2 Research design

Primary data was collected using a descriptive survey design. This method is used to collect responses and opinions to a given questionnaire. A mixture of quantitative and qualitative data was collected. The qualitative (explanatory) research design enabled respondents to describe directly their feelings, knowledge, experiences and opinions. A clear and detailed description was done to justify the process which also used questionnaires that were both closed and open ended. Apart from the questionnaire, interview guides, observation schedules and content analysis of the various syllabuses and corresponding teacher's guides were also employed.

The triangulation, method was used to validate data collection techniques and verify the authencity of the sources of information. This was then presented alongside the main data collection instruments followed by the planned strategies for data collection and analysis.

3.3 Target Population

The research focused on a population of over 15,000 students in twenty-five secondary schools located in Nakuru town Municipality. This is a relatively finite and homogenous population who joined secondary schools between the years 2007 and 2010.This population provided valid, varied and adequate data since they left primary schools within a span of the last three years. The population was also readily available and accessible in the neighbouring secondary schools.

3.4 Sampling Procedures and Sample size

The research used the sampling fraction conversion frame table by Krejcie and Morgan (1970) to get a sample size of nineteen secondary schools from a total of twenty five schools by random sampling. From the nineteen schools the study got a sample of 385 students from a target population of 11,261 proportionally calculated from the total population in each school. This was done using the formula provided by Mugenda and Mugenda (1999).

$n = (Z^2\ pq) \div d^2$

Where:

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

z = the standard normal deviate at the required confidence level. =0.05 which equal to 1.96

p = the proportion in the target population estimated to have characteristics being measured. (50%) as recommended by Fisher *et al.*

q = 1-p (.50)

d = the level of statistical significance set. (.05)

From this formula, a sample of 384 and above is recommended for a population of 10,000 and above. The study settled 385 as the sample size. This represents 3.4% of the total population. The same percentage was used to calculate samples sizes for each school using the formula; 3.4%×x where x = the population in a school as shown in Table 3.1.

Random sampling was used to pick students from each school based on the confidence that all selected have successfully completed the primary school cycle of education, a perfect target group for the research.

Table 3.1: Population and Sample Size of Schools

NAME OF SCHOOL	STUDENT POPULATION	SAMPLE SIZE
Afraha High School	784	27
Christ The King Academy	384	13
Flamingo Sec.School	588	20
Kenyatta Sec.School	636	22
Lanet Sec.School	552	19
Langalanga Sec School	612	21
Menengai High School	1,120	38
Moi Sec. School	624	21
Nakuru Boys Sec.School	672	23
Nakuru Central Sec.school	472	16
Nakuru Day Sec.School	848	29
Nakuru Girls Sec.School	696	24
Nakuru west Sec. School	560	19
Shiners Boys High School	501	17
St.Laurenzo Sec. School	402	14
St.Xaviers Sec. school	376	13
Tumaini Sec.School	660	23
Uhuru Sec. School	408	14
Upper Hill sec. School	366	12
TOTAL	**11,261**	**385**

3.5 Data Collection Methods

Primary data was collected using closed and open ended questionnaire. Open ended questions encouraged respondents to reveal more information without a feeling of inhibition which provided both quantitative and qualitative data.

The data collection procedure included randomly selected nineteen secondary schools in Nakuru town municipality. A further random selection was done proportionately in order to get respondents from each school making a total of three hundred and eighty five respondents as the total sample population. Filled data collection instruments (questionnaires) were checked in order to ensure that they were fully completed.

A pilot study was done before the actual data collection on a few respondents who were excluded from the final research. This helped in finding out whether the data collection tools were effective. The pilot study was done to establish whether the tools were measuring what they were intended to. The pilot study was expected to provide light on whether the respondents interpreted all the questions in the same way and necessary amendments were made. Consequently this upgraded the reliability and validity of the study instruments.

3.6 Validity

Validity is the systematic error in the measurement of research instruments. It refers to how well the measured indicators really measured what they were supposed to measure (Mugenda and Mugenda, 1999). In essence, it is the degree a test usually measures variables. The questionnaires were checked comprehensively to ensure that they collected all the information needed to address the objectives of the research. The accuracy, meaningfulness and technical soundness of research, was ensured through the checking of data collection tools by the researcher in consultation with the supervisor.

3.7 Reliability

Reliability is the measure of the degree to which research instruments give similar results over a number of related trials producing similar results consistently. A pilot study was

carried out and the split half method was used to test the correlation of the responses for consistency and hence reliability. The results indicated reliability of the instruments. To free the data collection tools from unreliability and misinterpretation, test-retest was used when applying the research tools in order to test reliability. Initial responses to the questionnaires helped in rewording the questions to avoid inconsistency. Any items missing in the questionnaire were added and the unsuitable ones eliminated.

3.8 Data Analysis Methods

The questionnaires were initially scrutinised to ensure that they were properly filled. The coded data was entered in an excel spreadsheet and analysed with Statistical Package for Social Scientists (SPSS) to generate frequency distributions and percentages descriptive statistics were used to examine the pattern of responses and to capture data from the respondents. Textual data obtained was analysed by thematic and content analysis. The findings were presented using tables and content analysis.

3.9 Operational Definition of Variables

Table 3.2: Operational Definition of Variables

Objectives	Variables	Indicators	Measurement Scale	Type of Analysis
1.To investigate the status of EE and evaluation among Secondary school Students.	**Dependent**	1.Number of Environmental Clubs, societies, Groups etc.	Nominal	Descriptive
	Independent	2.Types and number of Commendation e.g. Awards, Certificates, Trophies etc	Nominal/ Ordinal	Descriptive
2. To determine the relationship between EE and Conservation.	**Independent**	3.Number of Students in Environmental Clubs, societies And Clubs.	Interval	Descriptive
		4.Number of teaching / learning materials and resources on environment	Interval	Descriptive

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3.To find Out the lessons Learnt from previous EE Evaluation.	**Dependent**	5.Number and size of environmental action groups	Nominal/ Ordinal	Descriptive
		6.Time spent on environment activities	Ordinal	Descriptive
		7.Number of TV and radio programmes watched/ listened	Nominal	Descriptive
4.To identify the various Sources of information on EE for the youth.	**Independent**	8.Examples of Sustainable Uses of Resources in Schools.	Nominal	Descriptive

5.To investigate the challenges that exists in EE and an evaluation of possible solutions	**independent**	9.Observable Corrective Measures	Nominal	Descriptive
	independent	10.Records of Environmental activities	Ordinal	Descriptive

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

In this chapter, the results of the study are presented and discussed in relation to the study objectives. The chapter is divided into Response Return Rate, Demographic characteristics of Respondents, Status of EE among secondary school students, the relationship between EE and conservation, Sources of information on EE for the Respondents, Challenges that exist in EE among the Respondents and Additional comments. Extra space was provided to capture qualitative data on some of the variables.

4.2 Response Return Rate

Table 4.1: Response return rate

Response	Frequency	Percentage
Returned	312	81.0
Not returned	73	19.0
Total	385	100.0

Out of the three hundred and eighty five questionnaires given out to the respondents, three hundred and twelve were received back while seventy three were not. This represented 81% turnover as shown in Figure 3. It is upon these returned questionnaires that the research data analysis, presentation, interpretation and discussion were done.

4.3 Demographic characteristics of the Respondents

The respondents were secondary school students in Nakuru town Municipality

Table 4.2 Respondents distribution by gender

Gender	Frequency	Percentage
Male	169	54.2
Female	143	45.8
Total	312	100.0

From Table 4.3 shows that 54.2% of the respondents were males while 45.8 % were females. This shows that there were more male respondents.

Table 4.3 Age distribution of respondents

Age	Frequency	Percentage
12-15	169	54.2
16-20	143	45.8
Total	312	100.0

Table 4.2 shows that majority of the respondents (54.2%) were aged between 12-15 years. Those aged 16-20 years were 45.8 % who are students mainly in forms three and four.

Table 4.4 Respondents distribution by form

Form	Frequency	Percentage
One	81	26.0
Two	79	25.3
Three	77	24.7
Four	75	24.0
Total	312	100.0

Table 4.3 shows the distribution of respondents across the classes in secondary schools. Form ones formed the majority with 26.0 %, Form twos 25.3%, Form threes 24.7 % and Form fours 24.0 %.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

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4.4 The status of EE among Secondary school students

Table 4.5 Enhancement of Knowledge and Skills

Knowledge and skills enhancement	Frequency	Percentage
Large extent	61	19.6
Moderate extent	165	52.9
Small Extent	80	25.6
No extent	06	1.9
Total	312	100.0

In the above Table 4.4, majority of the respondents (52.9 %) felt that their knowledge and skills were moderately enhanced by environmental education.19.6% to a large extent, 25.6% to a small extent and 1.9% to no extent. In this regard, EE should be geared more towards the acquisition and enhancement of knowledge and skills on environmental matters among the respondents.

Table 4.6 Appropriateness of environmental education offered in primary school

Appropriateness	Frequency	Percentage
Large extent	52	16.7
Moderate extent	151	48.4
Small extent	86	27.6
No extent	23	7.3
Total	312	100.0

Table 4.5 shows that 48.4% of the respondents felt that EE offered to them in primary school was to a moderate extent appropriate, 16.7% to a large extent appropriate, 27.6% to a small appropriate and 7.3% no extent. On the question of whether EE has met their expectations, 36.4% indicated that it had to a large extent, 48.5% to a moderate extent and 15.2% to a

moderate extent. This response indicates that a gap exist that need to be filled up to make all the students feel that the environmental education offered to them is appropriate.

Table 4.7Ability to understand surroundings

Understanding of Surroundings	Frequency	Percentage
Large extent	59	18.9
Moderate extent	132	42.3
Small extent	105	33.7
No extent	16	5.1
Total	312	100.0

On the question of whether EE had improved their ability to understand the surroundings, 18.9% indicted to a large extent, 42.3% to a moderate extent, 33.7% to a small extent and 5.1% to no extent as shown in Table 4.6. In this case, more efforts should be made to relate EE to the natural surrounding of the respondents in an attempt to make EE practically oriented in answering the challenges that surround the students.

Table 4.8 Impact of EE on Respondents

Impact	Frequency	Percentage
Positive	293	94.0
Negative	2	0.6
Missing	17	5.4
Total	312	100.0

An overwhelming majority of the respondent equivalent of 94.6% felt that EE has had a positive impact on them. A paltry 0.6% answered to the negative while 5.4% declined to respond to this question as shown in Table 4.7. Another simple majority (52.3%) agreed that they have had a chance to further their Knowledge in EE after primary school while 47.7% disagreed. However, the respondents were not sure whether they have shared EE and

knowledge with other people since yes and no received 49.2% response each while 1.6% abstained.

4.5 The relationship between EE and conservation

The Tables in this section represent responses to questions used to evaluate whether the students learnt conservation through EE. The discussion follows thereafter.

Table 4.9 Involvement in conservation activities

Involvement in conservation activities	Frequency	Percentage
Yes	172	55.1
No	140	44.9
Total	312	100.0

Table 4.8 shows that 55.1% of the respondents felt that environmental education enabled them to participate in conservation activities while 44.9 % of 61.2 % of the respondents were of opinion that EE had familiarised them with education matters either to a large or moderate extent.33 % indicated small extent and 5.1 % no extent at all. The latter two groups should form a further concern for stakeholders. Majority of the respondents also felt that EE has enabled them to share environmental issues with others and keep track of environmental matters that is 62.3% and 59.4% respectively.

4.6 Sources of information on EE for the Respondents

Table 4.10 Greatest source of Environmental Education

Source	Frequency	Percentage
TV	40	12.8
Radio	46	14.7
Newspapers	39	12.5
Internet	43	13.8
Teachers	144	46.2
Total	312	100.0

From Table 4.5, majority of the respondents (46.2 %) felt that the greatest source of their environmental education is teachers. This is followed by radio 14.7%, internet 13.8%, TV 12.8 % and newspapers 12.5 % respectively. This means that the school system plays the most dominant role in the provision of EE among the respondents. However, efforts should be made to make full use of all the sources in the delivery of EE because each of them can play a vital role. The respondents were able to mention or name various programmes in the media that has given them environmental awareness like: The national Geographic, Earth watch, Ecospect, Mazingira 24 among others.

4.7 Challenges that exist in EE among the respondents

This section presents data collected to evaluate the challenges that the respondents face in the application of knowledge and skills in environmental education.

Table 4.11 Ability to apply Environmental Education

Ability to apply	Frequency	Percentage
Yes	201	64.4
No	98	31.4
Missing	13	4.2
Total	312	100.0

Table 4.10 shows that majority of the respondents (64.4%) were in agreement that EE offered to them had relevant practical application of learning.31.4% disagreed while 4.2% declined to respond. On the question whether the respondents have encountered any challenges in applying EE knowledge and skills, 72.8% were in affirmative and 27.2% answered no. The respondents were also able to identify the main environmental challenges facing Kenya today which include climate change, global warming, pollution, deforestation, poor garbage disposal, soil erosion, Inadequate rainfall among others.

4.8 Additional Comments

Questions in this section aimed at collecting data related to general environmental activities in school. Qualitative and quantitative data was collected.

Table 4.12 Number of environmental organizations in schools

Number	Frequency	Percentage
1	286	91.7
2	19	6.1
3	2	0.6
More than 3	3	1.0
None	0	0
Missing	2	0.6
Total	312	100.0

Table 4.11 shows that majority of the respondents (91.7%) indicated that they had one environmental club/society/group in their school. 6.1% indicated two, 0.6 indicated three,1.0% indicated more than three, 0% indicated none and another 0.6% declined to respond to the question. This is a clear indication that all the school sampled have environmental based organization(s).

Table 4.13 Average number of members in the environmental organizations

Membership	Frequency	Percentage
10-20	52	16.7
21-30	186	59.6
31-40	60	19.2
More than 40	14	4.5
Total	312	100.0

Table 4.12 shows that 59.6% of the respondents indicated that the size of membership in environmental organization in their schools is between 21-30, 19.2% indicated 31-40, and 16.7% indicated 10-20 and 4.5% indicated more than 40.This calls for further mobilization of students into environmental organizations as vehicles of creating environmental awareness and conservation. Only 11.3% of the respondents indicated that their schools keep environmental records. Another13.6% agreed that they have environmental learning and teaching materials in their schools, the rest 86.4% indicated that they do not have such facilities in their schools.

Table 4.14 Time spent on environmental activities per week

Time Spent per week	Frequency	Percentage
1-2 hours	195	62.5
3-4 hours	59	18.9
More than 4 hours	30	9.6
None	5	1.6
Missing	23	7.4
Total	312	100.0

Table 4.13 shows that majority of the respondents (62.5%) indicated that they spend between 1-2 hours a week on environmental activities.18.9% indicated 3-4 hours, 9.6% indicated more than 4 hours, 1.6 indicated none and 7.4% declined to respond to the question. Only 21.8% of the respondents agreed that they have environmental rehabilitation activities in their schools.

Table 4.15 Respondents membership in environmental organizations

Membership	Frequency	Percentage
Yes	83	27.6
No	229	72.4
Total	312	100.0

Table 4.14 shows that out of 312 respondents only 27.6% indicated that they are members of environmental clubs. The rest (72.4%) are not. This calls for further investigation on the poor membership in environmental clubs in our schools. As to the question whether the respondents pay attention to any environmental programme on the TV or radio, 63.1% were in affirmative while 36.9% do not.

Only 8.7% of the respondents consented to having received any awards, certificate or commendation on environmental matters. The rest (91.3%) have not received any recognition. 17.5% indicated the presence of conservation projects in their schools. The remaining 82.5% answered in the negative. Deliberate efforts should be made to recognise

and reward students' environmental activities which may act as a motivating factor towards creating environmental awareness and sensitization among the respondents.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMENDATIONS

5.1 Introduction

This chapter contains summary of Findings, Discussions, Conclusions and Recommendations. The purpose of the study was to determine the impact of environmental education on conservation among secondary school students in Nakuru town Municipality. This was to help determine the appropriateness of this programme and identify any gaps to be filled.

5.2 Summary of Findings by Objectives

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Table 5.1 Summary of Findings

Objectives	Main findings
1. The status of EE and evaluation.	⇨2.5% agreed that EE has to a large or moderate extent enhanced their knowledge and skills in environmental matters.65.1% also felt that EE offered in primary school was to a large or moderate extent appropriate.
2. Relationship between EE and conservation.	⇨55.1% indicated that EE has enabled them to participate in conservation activities while 44.9% disagreed.
3. Sources of information on EE for the Respondents.	⇨ 46.2% Indicated that teachers are their greatest source EE.The rest (53.8%) were distributed among the other four sources(TV, internet, Radio and Newspapers)
4. Challenges that exist in EE.	⇨ 72.8% Indicated that they have faced challenges related EE.

4. Challenges that exist in EE	However, 64.4% agreed that EE has enabled to apply skills and Knowledge learnt.

5.3 Discussions of Findings

Majority of the respondents (72.5%), were in agreement that EE has to a large or moderate extent enhanced their knowledge and skills in environmental matters. The remaining 27.5% felt that EE had only enhanced their knowledge and skills to a small or no extent. On the appropriateness of EE offered in primary school, 65.1% were of the opinion that it is to a large or moderate extent appropriate. 62.2% of the respondents indicated that EE had to a large or moderate extent improved their ability to understand their surroundings. The rest 38.8% expressed the view that EE had only to a small or no extent improved their ability to understand the surroundings. A big majority of 94.0% agreed that EE has had positive effect on them.

From the findings,55.1% of the respondents indicated that EE has enabled them participate in conservation activities while 44.9% felt the contrary. On the question whether the respondents were involved in conservation activities before joining secondary School, 62% answered yes while 38% said no.

Among the alternatives given between TV, Radio, Newspapers, Internet and Teachers, 46.2% of the respondents indicated that their greatest source of EE is teachers. The rest of the responses were shared between the remaining four alternatives which mean that the school system still plays a vital role in the dissemination of EE to students.

On whether the respondents had faced any challenges in EE, 72.8% answered yes and 27.2% no. However, 64.4% agreed that EE had given them the ability to apply the knowledge and skills learnt.

However, there is need to set aside more time to EE themes in the syllabus to improve its impact on the respondents. The study showed that the implementation of the integrated EE in the curriculum has not been very effective due to very many constraints particularly in

relation to inputs. Therefore, it is unlikely for it to achieve the full projected impact of achieving environmental awareness through the normal education channel. This calls for diversification of sources of disseminating EE knowledge the way it is done in the countries discussed in the literature review.

5.4 Conclusions

The conclusions of this study are based on the assumptions that the respondents' responses can be generalized on the population since secondary school students have many similar characteristics. The findings of the study showed a level of confidence by the respondents that EE has had positive effects on them. There are both repeated and consistent themes in the data on information collected which demonstrate a strong affirmative response to the questions asked. Positive impacts and influences from EE were identified at individual and school level. It showed reasonable awareness created among the respondents.

The methodology/techniques used in teaching EE were ineffective in creating awareness and attitude change to achieve permanent behavioural changes. The teachers were unable to use effective techniques due to congested curriculum, lack of awareness and exposure, lack of teacher guides, large classes and lack of learning resources. This program either lacked or ignored proper design and logical framework of implementation.

The EE programme also lacked adequate inputs and resources in terms of training the personnel to undertake the implementation. During the implementation of the project there was inadequate monitoring of the activities in the programme. There is a major problem in the integrated environmental education program in that it lacks well-implemented in-service training programmes for tutors.

Schools should assume responsibility for educating about environmental protection because environmental education can be effective as part of the school curriculum. EE should also be oriented towards sustainable development and the creation of public awareness of environmental issues through the promotion of environmental training among educators. Indeed the schools have amoral obligation towards this. Through the re-orientation of the curriculum towards a holistic approach. The implementation of EE in our schools is still

suffering from inadequacies in the implementation process such as poor teacher preparation, ineffective teaching methods, lack of teaching aids and crowded classrooms.

5.5 Recommendations for action

Based on findings, the study made the following recommendations:

There should be constant monitoring and evaluation of the programme to provide necessary baseline data for benchmarking. An elaborate logical framework for the implementation of EE should also be put in place right from the curriculum design stage. Bad factors that affect the environment and environmental concepts should be introduced into the curricula and exposed to the respondents.

There should be a bottom up approach in monitoring and evaluation of EE to make sure that it is learner centred and involving all stakeholders. Clear indicators should be identified to help in the evaluation process. More resources including time, teacher training and finances should be allocated to the process. Research on students' understanding of many aspects of the environmental issues should be undertaken so as to teach students more effectively.

The adequacy or inadequacy of the syllabus content should be analysed and its overall integration into the curriculum adjusted accordingly. Evaluate the techniques employed by tutors in primary teacher training colleges in teaching environmental education to teachers and establish the resources used including related topics.

There is need to ensure appropriate capacity building of implementers so as to realize the intended outcomes and impacts. There is need to sensitize all the players in the program on the need and appropriate use of Monitoring and Evaluation. The students should also be encouraged to keep records of their environmental activities in order to facilitate follow up activities.

Concerted efforts should also be made to make full use of the electronic and print media in the delivery of EE to the students. Literature review indicated that this has had great success in other countries. This is because the media is a great communicator and major attraction to the youth. Since students constitute a sizeable fraction of Kenyan's population, the formal

education system can be a very effective vehicle for creating environmental consciousness to the whole population. In addition, curriculum designed for environmental education should be clear and enough for teachers to realise desired environmental education including the fact that enough time should be given in class to teach it.

5.6 Suggestions for Further Study

Based on findings, suggestions for further studies are given below

1. An investigation of the challenges encountered in implementing the integrated Approach of teaching environmental education in our school system.

2. A comparative study of the methodologies used in the implementation of Environmental Education in other countries.

3. An investigation of the curriculum in our teacher training institutions to determine their Suitability in the further transmission of EE.

4. Causes of poor membership in schools' environmental organization as shown in table 4.14

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APPENDICES

Appendix 1: Introduction Letter

KARANJA, SIMON G.
PO.BOX 12367
NAKURU.
Reg.No:L50/72382/2009
Tel: 0721412413
email:karanjagachuru@yahoo.com

Dear respondents,

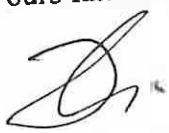
I am a student at the University of Nairobi undertaking a master's degree in Project Planning and Management. I am working on a research project on the evaluation of the effects of environmental education on secondary school students.

The purpose of this letter is to request you to participate in this study and fill in the questionnaire. All responses will be treated confidentially. Kindly answer all the questions to the best of your knowledge in order to help me fulfil the objectives of this significant study. This will help the country in improving environmental education, sensitization and awareness towards environmental sustainability.

Your acceptance and participation will be highly appreciated.

Thank you.

Yours faithfully



KARANJA, SIMON G.

RESEACHER

Appendix 2: Questionnaire for Students

SECTION 1: Respondents profile

(Tick one response that is applicable to you in questions number 1, 2 and 3)

1. What is your gender?
   - Male ( )
   - Female ( )

2. What is your age?
   - 12-15 Years ( )
   - 16-20 Years ( )

3. What is your current form?
   - Form 1 ( )
   - Form 2 ( )
   - Form 3 ( )
   - Form 4 ( )

4. Are you involved currently in any environmental conservation activities?
   - Yes ( )
   - No ( )

   If yes Please explain

_____

_____

_____

5. Were you involved in any environmental conservation activities before joining secondary school?
   - Yes ( )
   - No ( )

   If yes Please explain

_____

_____

_____

6. Which is the greatest source of your environmental knowledge/education?
   - TV ( )
   - Radio ( )
   - News papers ( )
   - Internet ( )
   - Teachers ( )

SECTION 2: RESPONDENT'S PERCEPTION OF ENVIRONMENTAL EDUCATION

7. To what extent do you think Environmental Education in primary school enhanced your knowledge and skills on environmental matters?
   - Large extent ( )
   - Moderate extent ( )
   - Small extent ( )

No extent ( )

8. To what extent do you think Environmental Education has enabled you to understand your surroundings?
   - Large extent ( )
   - Moderate extent ( )
   - Small extent ( )
   - No extent ( )

9. To what extent do you think Environmental Education has enabled you to share Environmental issues with others?
   - Large extent ( )
   - Moderate extent ( )
   - Small extent ( )
   - No extent ( )

10. To what extent has Environmental Education enabled you to keep track of environmental matters in and out side Kenya?
   - Large extent ( )
   - Moderate extent ( )
   - Small extent ( )
   - No extent ( )

11. To what extent do you think Environmental Education in primary school contained the appropriate information?
   - Large extent ( )
   - Moderate extent ( )
   - Small extent ( )
   - No extent ( )

12. To what extent do you think Environmental Education has provided you with sufficient Learning?
   - Large extent ( )
   - Moderate extent ( )
   - Small extent ( )
   - No extent ( )

13. To what extent do you think environmental education has had relevant practical application of Learning?
   - Large extent ( )
   - Moderate extent ( )
   - Small extent ( )
   - No extent ( )

14. To what extent do you think Environmental Education has met your Expectations?
   - Large extent ( )
   - Moderate Extent ( )
   - Small extent ( )
   - No extent ( )

15. To what extent do you think Environmental Education has prepared you for conservation/taking care of the environment?
   - Large extent ( )

Moderate extent ( )
Small extent ( )
No extent ( )

SECTION 3: APPLICATION OF ENVIRONMENTAL KNOWLEDGE AND SKILLS

16. Can you apply the skills and knowledge learnt in Primary School on Environmental Education?

Yes ( )
No ( )

Please explain

_____

_____

_____

17. Do you encounter any challenges in applying the knowledge and skills acquired in environmental education?

Yes ( )
No ( )

If yes please explain

_____

_____

_____

18. Have you ever consulted/been consulted by anybody for advice on environmental challenges?

Yes ( )
No ( )

19. Have you ever referred to the notes you have on Environmental Education?

Yes ( )
No ( )

If yes, what made you refer?

_____

_____

_____

SECTION 4: IMPACT OF ENVIRONMENTAL EDUCATION ON YOU

20. Has Environmental Education you acquired in Primary School had any positive effects on you?

Yes ( )
No ( )

If yes Please explain

_____

_____

_____

21. Has Environmental Education you acquired in Primary School had any negative effects on you?

Yes	( )
No	( )

If yes Please explain

_____

_____

_____

22. Since you left Primary School, have you had an opportunity to further your knowledge in Environmental Education?

Yes	( )
No	( )

If yes Please explain

_____

_____

_____

23. Since you left Primary School, have you shared your knowledge in Environmental Education with other people?

Yes	( )
No (	( )

SECTION 5: ADDITIONAL COMMENTS

24. How many Environmental clubs/societies/groups do you have in your school?

1	( )
2	( )
3	( )
More than 3	( )
None	( )

25. What is the average number of members in these clubs/societies/groups?

10-20	( )
21-30	( )
30-40	( )
More than	( )

26. Do you have any records of environmental activities in your school?

Yes	( )
No	( )

Please explain

_____

_____

27. Do you have any environmental teaching/learning materials in your school?

Yes	( )
No	( )

28. Do you have any environmental rehabilitation activities in your school?

Yes	( )
No	( )

If yes please explain

29. How much time do you spend in a week, on environmental activities?

1-2 hours	( )
2-4 hours	( )
More than 4 hours	( )
None	( )

30. Do you watch/listen to programmes from the TV/Radio about environment?

Yes	( )
No	( )

If yes please name them

31. Do you have any projects in your school that demonstrate sustainable use of resources?

Yes	( )
No	( )

If yes please explain

32. Have you ever received any award/certificate or commendation on environmental matters?

Yes	( )
No	( )

If yes Please explain

33. Do you think the Environmental Education offered in Primary School is contributing towards the conservation of our environment?

Yes	( )
No	( )

Please explain

34. What would you identify as the single most important influence or experience which has affected your attitude to our responsibility towards animals and the environment?
Tick one

36. What do you believe is the most important environmental challenge(s) facing Kenya currently?

_____

_____

_____

37. Are you a member of any environmental club?

Yes ( )

No ( )

If yes, please name the club

END

THANK YOU

Appendix 3: List of Centres for Population Sampling

1. Afraha High School
2. Christ The King Academy
3. Flamingo Secondary School
4. Hill Crest Secondary School
5. Hope Well Secondary School
6. Kenyatta Secondary School
7. Lady Ann Secondary School
8. Lanet Secondary School
9. Langalanga Secondary school
10. Menengai High School
11. Mogoon Secondary School
12. Moi Forces Secondary School
13. Moi High School
14. Nakuru Girls High School
15. Nakuru Boys High school
16. Nakuru Central Secondary School
17. Nakuru Day Secondary School
18. Nakuru West Secondary School
19. Shiners Girls High school
20. St. Michaels Secondary School
21. St.Laurenzo Academy
22. St.Xaviers Secondary School.
23. Tumaini House Secondary School
24. Uhuru Secondary School
25. Upper Hill Secondary School