ENVIRONMENTAL LITERACY COMPARISON BETWEEN ECO-SCHOOLS AND ORDINARY SCHOOLS IN WESTLANDS AREA, NAIROBI

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A research project submitted to the Department of Extra Mural Studies in partial fulfilment of the Post Graduate Diploma in Project Planning and Management

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DECLARATION

I declare that this is my original work and has never been submitted to any University or institution for examination purposes

_____   _____

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L42/61101/09

This project has been submitted to the University of Nairobi, Department of Extramural studies with my approval as university supervisor

_____   _____

MR. KIAMA.   **DATE**
UNIVERSITY OF NAIROBI

DEDICATION

I wish to dedicate this project to my parents for their love and everlasting support. To my family, for their continuous support during the time that I needed my peace and quiet to concentrate on gathering and assembling materials for my project. Your love, care and support have been my source of everlasting inspiration to me. May the Almighty God bless you all tremendously.

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My gratitude and profound appreciation goes to all the individuals and groups for their support to this project. This study would not have been possible without the openness of the students. I am also grateful to my colleagues for their assistance throughout this period.

ABSTRACT

The objective of the research was to investigate environmental education in Kenya. The research provides an elaborate explanation of the social, economic and ecological context of Kenya with an inclination towards aspects of Education for Sustainable Development (ESD). The education system has missed out on building important values, knowledge and skills that recognise the importance of sustainable development. The research identifies and discusses the three pillars of ESD namely; society, environment and economy. The emphasis is that ESD's goals can only be realised through a multi-sectoral approach. Stakeholders should therefore be drawn from the government, educational institutions, civil society, private sector and development partners. These stakeholders hold the 'key' to ESD implementation and its fulfilment.

This study included pupils who are provided environmental education as part of the curriculum during regular class hours, as well as those who are included in the Ecoschool programme. The aim of the study was to determine whether there were any differences between the two groups of pupils regarding their knowledge, awareness and environmentally responsible behavior and whether more extensive knowledge of environmental issues is related to greater awareness and environmentally responsible behavior.

The research was based on a questionnaire (test of knowledge and opinion scale) drafted especially for the purposes of the study. Statistical comparisons of the results of the tests of knowledge showed that the knowledge level is slightly higher in eco-school pupils than in pupils who do not have eco school programmes. Based on these findings, eco-school pupils are more environmentally aware but fail to promote environmentally responsible behaviour - although a positive influence in this area can nevertheless be seen.

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ABBREVIATIONS

WSSD	World Summit on Sustainable Development
ESD	Education for Sustainable Development
UNCED	United Nations Conference on Environment and Development
MDG	Millenium Development Goal
EFS	Education for Sustainability
NEPAD	The New Partnership for Africa's Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
HIV	Human immunodeficiency virus
AIDS	Acquired immune deficiency syndrome
EFA	Education For All
TB	Tuberculosis
KES	Kenyan Shilling
ASAL	Arid and Semi Arid Land
CSO	Community Service Officers
KESSP	Kenya Education Sector Support Programme
PRSP	Poverty Reduction Paper Strategy
CRC	Convention on the Tights of the Child
UNLD	United Nations Literacy Day Decade

CHAPTER ONE

INTRODUCTION

1.1 Education for Sustainable Development

Education is the process of imparting values, intellectual, moral and social skills to learners for a particular purpose. Education and training, both formal and non-formal, are key processes by which human beings and societies can reach their full potential. Education is key to sustainable development. Educating people for sustainable development should provide the skills, perspectives, values and knowledge to live sustainably. It must be interdisciplinary -integrating concepts and analytical tools from a variety of disciplines and be re-oriented to include the changes needed to promote sustainable development.

The role of ESD was first highlighted in Chapter 36 of Agenda 21 (Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by governments, UN and major groups in every area in which humans impact on the environment. It was adopted by more than 178 governments at the UNCED held in Rio de Janeiro in 1992, which identified four major thrusts namely; the improvement of basic education, reorientation of existing education, developing public understanding and awareness as well as training to address sustainable development.

ESD is therefore an emerging but dynamic concept that seeks to empower people of all ages to assume responsibility for creating, maintaining and enjoying a sustainable future. It is not so much education about sustainable development but education for sustainable development, which makes the concept more participatory and comprehensive. The aim is not only for the educator and the learner to understand the issues of sustainable development but also to cope with and act upon the interdisciplinarity of the issue.

ESD is also a process of achieving sustainable development encompassing the three pillars namely; society, economy and environment. Thus, it includes; education for poverty alleviation, human rights, gender equity, cultural diversity, international understanding and

peace. The overall aim of ESD is to empower citizens to act for positive environmental and social change by giving people knowledge and skills to help them find new solutions to their social, economic and environmental issues.

1.2 Background of the Study

In Kenya, communities have generally relied on their vast indigenous knowledge and technology to interact with the environment. The traditional knowledge and technology has enabled communities a stable coexistence with their immediate environment thus maintaining the ecological equilibrium. However, industrialisation globalisation and population increase present new challenges in sustainable utilisation of the country's resources. This has resulted in the disruption of natural and cultural systems. It is imperative, therefore, that capacity is built to ensure sustainable use of national resources.

Education is at the heart of sustainable development and is, therefore, a key means to achieving sustainable utilisation of the country's resources. Among other things education is a vessel to achieving the Millennium Development Goals(MDGs). Human security and economic prosperity depend on the ability of a country to educate and prepare its people to thrive in a rapidly changing world. An innovative and dynamic society not only embraces change but also influences it. Education enriches cultures, creates mutual understanding and underpins peaceful societies.

1.2.1 Millenium Development Goals

Millenium Development Goals are goals to be achieved by 2015 that respond to the world's main development challenges. They were adopted by 189 nations and signed by 147 heads of state and governments during the UN Millenium Summit in September 2000.

Goal 1	Eradicate extreme poverty and hunger
Goal 2	Achieve universal primary education
Goal 3	Promote gender equality and empower women
Goal 4	Reduce child mortality

Goal 5	Improve maternal health
Goal 6	Combat HIV/AIDS, malaria and other diseases
Goal 7	Ensure environmental sustainability
Goal 8	Develop a global partnership for development

Table 1:Millenium Development Goals

Unlike most education movements, ESD was initiated by people outside of the education community. In fact, one major push for ESD came from international political and economic forums (e.g., United Nations, Organization for Economic Co-operation and Development, Organization of American States). As the concept of sustainable development was discussed and formulated, it became apparent that education is key to sustainability. In many countries, ESD is still being shaped by those outside the education community. The concepts and content of ESD in these cases are developed by ministries, such as those of environment and health, and then given to educators to deliver.

Two of the major issues in the international dialog on sustainability are population and resource consumption. Increases in population and resource use are thought to jeopardize a sustainable future, and education is linked both to fertility rate and resource consumption. Educating females reduces fertility rates and therefore population growth. By reducing fertility rates and the threat of overpopulation a country also facilitates progress toward sustainability. The opposite is true for the relationship between education and resource use. Generally, more highly educated people, who have higher incomes, consume more resources than poorly educated people, who tend to have lower incomes. In this case, more education increases the threat to sustainability**.**

Unfortunately, the most educated nations leave the deepest ecological footprints, meaning they have the highest per-capita rates of consumption. This consumption drives resource extraction and manufacturing around the world. Every nation will need to re-examine curriculum at all levels (i.e., pre-school to professional education). While it is evident that it is difficult to teach environmental literacy, economics literacy, or civics without basic literacy, it is also evident that simply increasing basic literacy, as it is currently

taught in most countries, will not support a sustainable society.

1.3 Statement of the Problem

The study is aimed at investigating the importance of teaching students about the environment in schools. Environmental education is not in the school curriculum but some schools engage their students in environmental activities to make them aware and provide them with knowledge on the environment. The study will show the difference between eco-schools and non eco-schools and just how important it is to educate students on the environment. Kenya has witnessed serious loss of natural resources in the recent past and if this trend is not checked, then the country may soon lose all its treasured environmental resources. The children are the future generation and thus the society has to teach them to become responsible to the environment.

1.4 Purpose of the Study

The study is aimed at determining whether there are any differences between pupils who are provided environmental education as part of their curriculum and those who do not. The aim of the study is to determine whether there are any differences between the two groups of pupils regarding their knowledge and awareness on the environment. The study is aimed at significantly contributing to the realization of sustainable development in Kenya that will ensure a safe and sustainable environment, a strong economy and a just society.

1.5 Objectives of the Study

1.5.1 Main Objective

The main objective of the study is to give an enhanced profile to the important role of education in sustainable development to schools in Westlands, Nairobi

1.5.2 Specific Objective

1. To orient the existing school curriculum to promote to sustainability development
2. To create awareness and build understanding of the principles of sustainable development

3. To identify the major issues that inhibit education for sustainable development
4. To develop strategies at every level to enhance capacity for ESD

1.6 Research Questions

1. How can education for sustainable development be understood and what new challenges does it bring to educational institutions at all levels?

2. How does the current school curriculum affect the implementation of learning for sustainable development?

3. What role do values and ethics play in education for sustainable development and how should they be handled?

4. What barriers need to be crossed for implementation of education for sustainable development among practitioners in the education sectors to be realised?

1.7 Significance of the Study

The study proposes modalities that will contribute to the attainment of sustainable development. The study aims at enhancing the role of education and learning for equitable, efficient and sustainable utilization of the country's resources. The study will promote better environmental practices and understanding of social institutions and peaceful co-existence between people as well as creating a balance between economic growth and environmental concerns. The study will benefit students in schools and the whole country as a whole.

1.8 Scope of the Study

Education is humanity's best hope and most effective means in the quest to achieve sustainable development. However, the quality of education is of paramount importance. Much of current education falls far short of what is required; to impart skills, knowledge and values that recognise the importance of sustainable development. This study is a far-reaching undertaking that provides an opportunity for Kenya to develop and implement an education system and programme, which develop values that promote viable, alternative approaches to sustainable development. Its conceptual basis, socio-economic implications, and environmental and cultural connections make it an enterprise, which potentially touches on

every aspect of life. In pursuing ESD, therefore, there must be some clarity in what sustainable development means and what it aims to achieve. Sustainable development seeks to promote social values, which aim to balance economic development needs and ecological sustainability.

1.9 Delimitation of the Study

There is a strong likelihood of establishing a good relationship with the respondents once they understand how the study could assist them through proposing means which once acted up on would contribute immensely in introducing environmental education into schools.

Various stakeholders who have invested in advocating for environmental sustainability would not have to dedicate most of their time in establishing certain scenarios which the study intends to cover.

2.0 Limitation of the Study

1. Increasing Awareness

The initial step in launching an ESD program is to develop awareness within the educational community and the public that reorienting education to achieve sustainability is essential. If government officials or school district administrators are unaware of the critical linkages between education and sustainable development, reorienting education to address sustainable development will not occur.

2. Structuring and Placing ESD in the Curriculum

Kenya faces a fundamental decision in addressing an ESD strategy. A decision must be made on a method of implementation—whether to create another "add on" subject, (e.g., Sustainable Development, Environmental Education, or Population Education) or to reorient entire education programs and practices to address sustainable development. In reality, education related to sustainable development will be implemented in a wide range, in both depth and breadth. In some communities, ESD will be ignored; in others it will be barely addressed. In some, a new class dedicated to ESD will be created, and in others the entire curriculum will be reoriented to address sustainability. ESD in its real and effective forms gives students the skills, perspectives, values, and knowledge to live sustainably in

their communities.

3. Linking to Existing Issues: Educational Reform and Economic Viability

The effectiveness of the world's educational systems is already critically debated in light of the changing needs of society. The current widespread acknowledgment of the need for educational reform may help advance ESD. If it can be linked to one or more priorities of educational reform, ESD could have a good chance for success. However, if promoters try to add another issue to an already over-burdened system, the chances of success are slim.

4. Facing the Complexity of Sustainable Development Concept

Sustainable development is a complex and evolving concept. Many scholars and practitioners have invested years in trying to define sustainable development and envisioning how to achieve it on national and local levels. Because sustainable development is hard to define and implement, it is also difficult to teach. Even more challenging is the task of totally reorienting an entire education system to achieve sustainability.

5. Developing an ESD Program with Community Participation

Perhaps the greatest obstacle to reorienting the world's educational systems is the lack of clarity regarding goals. In simple terms, those who will be called upon to educate differently, for example teachers or agricultural instructors or water-treatment trainers, eventually will ask, "What am I to do differently?" "What should I do or say now that I didn't say before?" These simple questions leave most "experts" in a difficult situation and the questioner without an adequate response.

6. Engaging Traditional Disciplines

ESD by nature is holistic and interdisciplinary and depends on concepts and analytical tools from a variety of disciplines. As a result, ESD is difficult to teach in traditional school settings where studies are divided and taught in a disciplinary framework. In Kenya where the 8-4-4 system describes in detail the content and sequence of study in each discipline, ESD will be challenging to implement. In other countries where content is described generally, ESD will be more easily implemented, although doing so will require creative teachers who are comfortable and skilled at teaching across disciplines.

7. Sharing the Responsibility

Popular thinking promotes the myth that an informed society is solely the responsibility of the ministry of education. In reality, however, the ministries of environment, commerce, state, and health also have a stake in ESD, just as they have a stake in sustainable development. By combining expertise, resources, and funding from many ministries, the possibility of building a high-quality, successful education program increases.

8. Building Human Capacity

The successful implementation of a new educational trend will require responsible and accountable leadership and expertise in both systemic educational change and sustainable development. Kenya must develop realistic strategies to quickly create knowledgeable and capable leadership. It is unrealistic to expect the country to retrain thousands of teachers and thousands of administrators in ESD. We must find ways, such as employing the strengths model, to use existing skills.

2.1 Assumptions of the Study

The environment in Kenya is been threatened by human activities. This has resulted to a loss of biodiversity, unsustainable utilization of biodiversity resources pests, parasites and diseases, human wildlife conflicts among others. As an individual you need to make the right choices in your everyday life. We cannot leave the decisions to experts we must take part. Therefore, EE and ESD focus on the long term effects of our current way of living and what we as individuals can do to ensure environmental conservation and also a sustainable environment.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Education is an essential tool for achieving sustainability. People around the world recognize that current economic development trends are not sustainable and that public awareness, education, and training are key to moving society towards sustainability. People argue about the meaning of sustainable development and whether or not it is attainable. They have different visions of what sustainable societies will look like and how they will function. These same people wonder why educators have not moved more quickly to develop education for sustainability (EFS) programs. The lack of agreement and definition has blocked efforts to move education for sustainable development (ESD) forward.

2.2 Sustainable Development

Sustainable development was a key agenda at the Earth Summit that was held in Rio de Janeiro in 1992 and further reinforced at the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002, where a new paradigm of sustainable development was endorsed. It was declared that sustainable development is built on three interdependent and mutually reinforcing pillars, namely social development, economic development and environmental protection. This was based on the premise that pressure on the environment and natural resources has kept the state of the world's environment fragile thereby resulting in increased poverty, unsustainable production and consumption patterns.

Sustainable development is defined as 'the development that meets the needs of the present generation without compromising the ability of future generations to meet their needs. The concept of sustainable development emerged in the 1980s in response to a growing realisation that economic and social activities have potential to compromise environmental quality as well as lower the productive potential of natural resources. Sustainable development takes into account society, environment and economic factors conceptualised as pillars in order to ensure a more balanced form of

development. However, it is an evolving concept embracing emerging challenges and concerns.

The society pillar provides space for people to understand social institutions and their role in change and development. It aims to uphold peaceful co-existence among communities, equitable access and sharing of resources and respect for the rights and dignity of others. The environment pillar evokes awareness on resources and fragility of the physical environment and the effects on it arising from human activity and decisions with a commitment to factoring environmental concerns into social and economic policy development. The economic pillar revolves around the potential and limits of economic growth, and their impact on the society and the quality of the environment. It calls for a commitment to assess personal and societal levels of consumption out of concern for the environment and social well-being.

It is curious to note that while we have difficulty envisioning a sustainable world, we have no difficulty identifying what is unsustainable in our societies. We can rapidly create a list of problems - inefficient use of energy, lack of water conservation, increased pollution, abuses of human rights, overuse of personal transportation, consumerism, etc. But we should not blame ourselves because we lack a clear definition of sustainability. Indeed, many truly great concepts of the human world - among them democracy and justice - are hard to define and have multiple expressions in cultures around the world.

2.3 Theoretical Background

ESD involves the teaching of values and other moral ethics in education systems to ensure the creation of sustainable environments in which people can live and work, with the natural environment, economic development and social life are seen as mutually dependent, and the interaction between them contributes to the sustainability and enhancement of the quality of people's lives and the natural environment (Fien, 1995). While there is much debate around the world about the means and mechanisms for achieving this transition, there seems to be wide agreement that education has an important role to play in

transforming values as well as empowering individuals and groups to participate in environmental improvement and protection. Sustainable development cannot exist as some static equilibrium state. Permanent scientific and technological innovation necessitate that sustainable development exists in some form of dynamic equilibrium. One reason is the ongoing tension between social interests and environmental interests in practical sustainability projects (Robottom, 2003). Thus the aspects of environmental sustainability with ecological and economic sustainability should also be emphasized in the discussion of ESD.

The World Conservation Strategy was quite explicit about the role of education in bringing about changes in social values. Caring for the Earth: A Strategy for Sustainable Living which was prepared as the World Conservation Strategy for the 1990s (IUCN, UNEP and WWF, 1991) also argues that education has a vital role to play in ensuring that people learn, accept and live by the principle that 'living sustainably depends on accepting a duty to seek harmony with other people and with nature' (p.8). Agenda 21 (the internationally agreed report of the United Nations Conference on Environment and Development or 'Earth Summit' which was held in Rio de Janeiro in June 1992) states the role of environmental education in relation to sustainability: "Education is critical for promoting sustainable development and improving the capacity of the people to address environ-goals in the light of contemporary thinking on the role of environmental education in promoting a sustainable environment."
(Fien,1995).

Researchers define education for sustainability as a process which: (1) enables people to understand the interdependence of all life on this planet, and the repercussions that their actions and decisions may have, both now and in the future, on resources, on the global community as well as their local one, and on the total environment; (2) increases people's awareness of the economic, political, social, cultural, technological and environmental forces which foster or impede sustainable development; (3) develops people's awareness, competence, attitudes and values, enabling them to be effectively involved in sustainable development at local, national and international level, towards more equitable or sustainable future, integrating environmental and economic decision-making; and (4)

affirms the validity of the different approaches contributed by environmental education, including the need for further development and integration of the concepts of sustainability in these, other related cross-disciplinary educational approaches, as well as in established discipline

2.4 Emphirical Literature

Sustainable development issues to be addressed through education in Kenya are complex and interlinked. The issues can be classified as societal, economic and environmental. Societal issues include: concerns of poor governance(NEPAD African Peer Report, 2005.), corruption, bigotry towards cultural diversity, ethnic animosity, gender inequality(Girls' and Women's Education in Kenya, UNESCO, Nairobi, 2006; EFA Global Monitoring Report 2006, UNESCO, Paris) , HIV/AIDS(Public Sector Workplace Policy on HIV and AIDS, April 2005.), incidence of malaria, tuberculosis (TB) and other communicable and non-communicable diseases, human rights abuse, all forms of violence and increased insecurity(Economic Survey, 2005, Central Bureau of Statistics), scolded lifestyles and behaviour, drug and substance abuse, and erosion of cultural values and morals, among others.

The economic issues revolve around systems of production, consumption, investments and service delivery towards an enhanced GDP. However, several challenges such as high levels of poverty and related issues impede optimal performance of the economy. The current projections indicate that 56 per cent of the Kenyan population live below the poverty line earning less than US $1.00 per day(Economic Recovery Strategy for Wealth and Employment Creation, 2003-2007). Further, the gap between the rich and the poor has continued to widen with a per capita income of about KES 1,239 per month in the rural areas and KES 2,648 in urban areas(Welfare and Monitoring Survey, 1997). As such there are predominantly more poor members of society.

The other challenges affecting economic growth and performance include inadequate investment infrastructure leading to rising levels of unemployment, rural/urban migrations, corporate irresponsibility and lack of accountability and corruption. Additionally, the

inefficient and wasteful production systems lead to unsustainable utilization of natural resources resulting in their degradation. Further, the poor enforcement of policies and regulations governing production and marketing hinder economic growth and the attainment of its optimal performance.

The environment sector has not been spared either. The country has experienced severe environmental challenges including droughts, natural disasters, acute water shortage, climate change and variability, loss of biodiversity and poor waste management systems. This has resulted in land degradation and loss of forest cover which currently stands at a mere 1.7 per cent of the total territorial surface area falling far below the globally recommended 10 per cent minimum cover. Moreover, about 88 per cent of the country's total surface area is comprised of ASALs while desertification is on the rise as a result of fragility of the ecosystems.

Negative impacts on the environment have been as a result of the robust industrial development experienced in the country over the last four decades. This has resulted in increased waste generation leading to unsustainable waste management systems.

It is therefore imperative that national resources be utilised sustainably to meet the needs of the present generation without compromising the ability of the resource base to continue providing the same services and goods in the future. Although the Kenyan education philosophy embraces the principles of sustainable development, the above challenges persist hindering its realisation. Consequently, the concept of ESD is timely and is expected to provide the modalities for attaining sustainable development.

2.5 Justification

The government, CSOs and the private sector have been involved in formal, non-formal as well as informal education for quite some time now. The government has been the key player in formal education. However, some CSOs, the private sector, organised groups such as youth, women, trade unions and political parties have also made notable contributions to formal and non-formal education.

The government, CSOs and private sector have made notable ESD-related responses in relation to society, environment and economic spheres of sustainable development. These include policy formulation, advocacy and public awareness, resource material development, research and innovations, capacity building, networking, partnerships and vision-building.

A synopsis of some of the notable ESD-related responses made by these sectors includes; (1) *Policy formulation* - The government has involved CSOs and the private sector in the formulation and development of national policy documents hinging on sustainable development. These include Sessional Paper No. 1 of 2005, A Policy Framework for Education, Training and Research; Kenya Education Sector Support Programme (KESSP); Sessional Paper No. 2 of 1997 on Industrial Transformation to the Year 2020; Poverty Reduction Strategy Paper (PRSP) for the period 2001-2004; Economic Recovery Strategy for Wealth and Employment Creation (2003-2007); Sessional Paper No.2 of 2005 on Development of Micro and Small Enterprises for Wealth and Employment Creation for Poverty Reduction; National AIDS Control Strategic Plan, (1999); Forest Act (2006); Anti-corruption and Economic Crimes Act (2003); and the Vision 2030.18; (2) *Public awareness and advocacy* - Civil society organisations have been in the front line of public awareness and advocacy campaigns for social justice, environmental management, economic recovery and development.

In this regard, several programmes have been initiated and community participation enhanced. Government ministries/departments and the private sector have also been involved in public awareness and advocacy. In spite of these efforts there is an awareness gap, which needs to be filled; (3) *Resource material development* - The government and CSOs have developed several resource materials for public awareness as well as education on sustainable development themes such as anti-corruption, gender equity, HIV and AIDS, governance, poverty reduction, environmental management, among others. The materials developed are in form of posters, banners, brochures, badges, booklets, fliers, books, symbols and audiovisuals among others. Some private sector players have also supported the material development processes; (4) *Research and innovations* - Institutions of higher learning, CSOs and government departments have undertaken research projects aimed at

identifying sustainable development issues and risks. have also been actively involved in developing new and better approaches and models They for environmental sustainability, economic development and social justice. Some private sector players have undertaken research projects aimed at identifying impediments to economic growth as well as developing new and better models for economic growth. (5) *Capacity-building* - The government, CSOs, institutions of higher learning and the private sector have undertaken capacity-building projects for communities as well as institutions for the sake of economic development, social justice and better environmental management. Capacity-building has mainly been through infrastructure development, training, workshops, seminars, micro-grants, micro-credit facilities and demonstration projects; and (6) *Networking, partnerships and vision-building* Government, institutions of higher learning, CSOs and the private sector have established partnerships and networks to enhance social justice, environmental protection and economic development. Visions and strategies for sustainable development have also been developed to direct sustainable development programmes and activities.

2.6 Education, Training and Research in Kenya

The government and the entire population perceive education, training and research as factors that influence national development. These factors are seen as tools to address local challenges and provide possible practical solutions and options. An efficient and effective education system provides the necessary modalities and infrastructure to facilitate learning, training and research that take cognisance of local issues. It is on this basis that appropriate policies have been developed to guide education, training and research in the country.

Kenya is signatory to international commitments and conventions related to education such as Education For All (EFA) Dakar Framework of Action, MDGs, United Nations Literacy Decade (UNLD), Convention on the Rights of the Child (CRC). Sessional Paper No. 10 of 1965, Board of Adult Education Act, Education Act (1968) and Sessional Paper No. 6 of 1988 on Education and Manpower Training for the Next Decade

and Beyond, among others, are the laws and policies that have guided the philosophy and provision of education in the country since independence. The Children's Act (2001) highlights the right of every child to free compulsory basic education.

The most recent policy step is the passing of the Sessional Paper No. 1 of 2005, A Policy Framework for Education, Training and Research. This policy paper recognises the integral role of education and training in promoting national development and re-affirms the government's commitment in the provision of quality education and training for national development. To operationalise Sessional Paper No. 1 of 2005, the government developed the Kenya Education Sector Support Programme (KESSP) to provide a comprehensive understanding of the issues and reform priorities in education, training and research. The Sessional Paper and KESSP, among others, embrace EFA and MDGs.

The policy framework is based on the philosophy of 'education and training for social cohesion, human and economic development'. It is further guided by nine national goals of education (ref. Sessional Paper No.10 of 1965) based on the principles of national unity, social responsibility, unity of purpose, moral and ethical values, lifelong learning, science and technology, equity, quality of education as well as environmental conservation and management. The Sessional Paper upholds the need to address global issues such as environmental concerns, technology, gender disparities, among others, through education. It also recognises the need to offer Kenyans education and training that promotes sustainable development, peace and social justice. The existing policy on education, training and research aims at enhancing national development and recognizes the role of education in sustainable development. Ideally, if fully and properly implemented, the policy would ensure education that contributes.

2.7 Conceptual Framework

Different development activities rely on the environment and have ecological social and economic impacts which may be positive or negative. Sustainable development requires that we strike a balance between the three components such that any development activity should not have a negative impact on the environment, it should be socially acceptable and be able

to impact positively on the economy of the local community.

 The World Commission on Environment and Development defined sustainable development as 'development that meets the needs of the present generation without compromising the ability of future generations to meet their needs'.

B1   C1

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                    ┌──────────────┐              ┌──────────────────┐
                    │  Positive    │              │  Effective       │
                    │  Influencing │─────────────▶│  Environmental   │
                    │  Factors     │              │  Management      │
                    └──────────────┘              └──────────────────┘
A                        ▲
  ┌──────────────┐       │
  │ Environmental│       │
  │ Management   │───────┤
  │ Problems     │       │
  │              │       ▼
  └──────────────┘  ┌──────────────┐              ┌──────────────────┐
                    │  Negative    │              │  Ineffective     │
                    │  Influencing │─────────────▶│  Environmental   │
                    │  Factors     │              │  Management      │
                    └──────────────┘              └──────────────────┘
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B2   C2
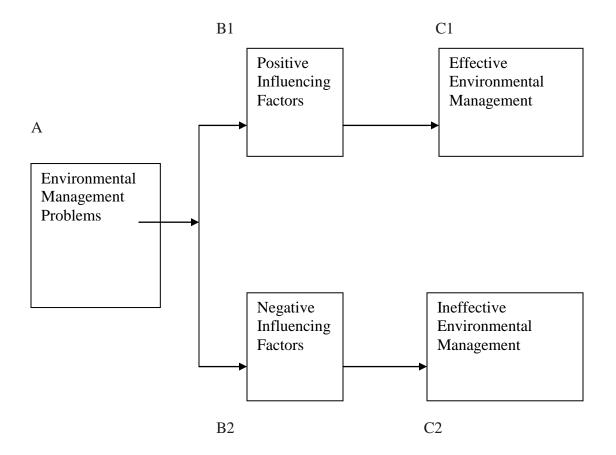
Figure 1: Diagram Showing Conceptual Framework

C1 and C2 represent the ultimate result which could either be effective or ineffective Environmental management depending on whether factors B1 and B2 are exploited favorably or unfavorably in aim of eradicating Environmental management problems in the region. This study sought to examine environmental sustainability in secondary and

primary schools in Westlands region. Environmental sustainability is believed to depend on several key elements, the most important of which is resource management. Generally, the present Environmental problems (A) facing many Westlands regions is influenced by a number of factors (B1 and B2). These include; lack of a well defined environmental programme in schools, lack of motivation amongst students and teachers, lack of policies to support environmental programmes and also lack of role models for the students to emulate. The success of effective Environmental Management will depend on how best these factors are managed (C1). However, if these factors are not dealt with positively, then there will be environmental degradation(C2).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

This refers to the nature, outlook and character that the researcher has taken. The researcher has clearly identified a target population from which specific samples have been identified following clearly outlined procedure. The time horizon of the study was cross-sectional design where data was collected over a couple of weeks. The research used mainly a questionnaire survey. The unit of analysis was the environmental knowledge of the students. The sampling design selected 4 schools within the region of study. Purposive sampling was used to select these schools two schools to represent secondary schools and the other two schools to represent primary schools. Only four schools were selected for the study because of the limitations on resources and time. The Statistical design involved participants were given questionnaires to fill and the data was later analyzed and interpreted using SPSS.

3.2 Study Area

The study area was Westlands region. Westlands Division is one of the eight divisions that make up Nairobi district. Westlands covers an expansive area and is divided into six subdivisions. It is fairly populated with an approximate of 207,610 persons who constitute a 9.7% of the entire population in Nairobi as per 1999 census report (GOK 2001); it is currently approximated to be 304,415.

3.3 Study Population

The sample of the population were three schools in Westlands constituency; Lavington Primary School, Aga Khan High School , Consolata School and Loreto Primary School.

Population Category	Number of students	% of Target population
Lavington Primary School	906	22.8
Loreto Primary School	1,050	26.5

Aga Khan High School	810	20.4
Consolata School	1,200	30.3
Total	**3,966**	**100**

Table 2: Study population

3.4 Sampling Procedure and Method

The researcher selected random sampling technique to the fact that the target population is school students in primary and secondary schools. The design was deemed suitable because the purpose was to evaluate the level of knowledge students have on the environment. The sample included 200 pupils attending 4 different schools in Westlands Constituency, the criterion being their geographical proximity. Two of the schools had already been included in the eco-school programme, meaning that in compliance with the curriculum they had been involved in various projects and activities linked to the environment and ecology, whereas two of them had not been involved in the eco-school project before. The control group comprised 100 pupils not included in the eco-school programme, while the experimental group consisted of 100 pupils included in the eco-school programme. In the school year 2009-10 they were all primary school level students. They were all of the same age and attended the same class; their schools were situated in the same town, and they were educated according to the same national curriculum.

Population Category	No. of students	Sample Number	Percentage %
Lavington Primary	906	40	20
Loreto Primary School	1,050	60	30
Aga Khan High School	810	40	20
Consolata School	1,200	60	30
Total	**3,966**	**200**	**100**

Table 3: Study sample

3.5 Data Collection Procedure and Methods Used

The researcher collected data using questionnaire instruments. The questionnaire items were made up of both semi structured and structured questions to avoid being too rigid and quantify the data. This method helped the researcher to collect accountable information, which would not have otherwise been possible using interview method. The researcher informed all the school administration, teachers and pupils on the purpose of the research, the expected duration of participation, and the procedure to be followed after data collection. Dates for administering the questionnaire were mutually agreed between the researcher, school heads, teachers and the pupils. The researcher also informed the respondents about the extent of privacy and confidentiality, the value of the research, and guaranteed that the data would be used for no other purposes. The pupils also had the right to remain anonymous and to decline to respond to items if they so wished. The researcher undertook to be sensitive to human dignity and to collect the returns for analysis immediately on completion. The data collected from the questionnaires was valid and reliable as it reflected the environmental literacy of the students.

3.5.1 Questionnaires

These are prepared questions that are written and answered by various individuals. They assist one in getting information for a particular study or research. Questionnaires are normally brief sentences, which are to the point so that the meaning is not distracted. The questionnaire comprised of 28 structured questions. The items covered three key environmental issues: namely, deforestation, water pollution and land pollution. Pupils identified and selected the environmental issues in their local areas and what they thought were the causes, effects and solutions to the identified environmental issues or gave their own opinions.

The questionnaire was used as the main data collection method and was found appropriate in order to collect in-depth information and also owing to the limited time scale available for the completion of the project. In addition, it helped to bring out information on ecological factors, educational performance factor and poverty levels apart from other environmentally related problems.

3.6 Data Processing and Analysis Methods

This study involved administering questionnaires to the schools with a view of capturing their views on the importance of the environment. Content analysis techniques were applied on the data generated. Content analysis is a multipurpose method for data collection, analysis and for investigating a variety of problems in which the communication serves as the basis for inference (Majumdar, 2005). Descriptive statistics were used to portray the sets of categories formed from the data. Descriptive statistics enable the researcher to meaningfully describe a distribution of measurements (Mugenda & Mugenda, 1999) and also to describe, organize and summarize data (Fain 1999).

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter addresses the presentation and analysis of data. The data is composed of both qualitative and quantitative analysis on the basis of the instrument used.

4.2 Knowledge and Awareness of the experimental and control groups

4.2.1 Knowledge

The analysis showed a statistically significant difference in knowledge in the answers to questions 21 (Which human activities have led to the low quality of water from your source(s) and 4 (Match the terms in the left column [genetics, ecology, evolution] with the correct definitions).Differences in all other answers were slightly smaller (statistically insignificant) and were observed in favour of the experimental group in the answers to the following questions: question 4 - the pupils were asked to define the concept endangered species; and question 2 - they had to put the elements of the food chain in the right order. Surprisingly, the control group was slightly better in question 22 - the pupils listed documents on environmental protection (e.g. the Kyoto protocol) and question 13 – describe what and where you have noticed degradation because of human actions.

Given the fact that discriminatory analysis detected only a small statistically significant difference in knowledge between the two groups, the average score by pupil and the average of correct answers for both groups was calculated for the first part of the questionnaire. Pupisl attending a non ecoschool obtained average score 15.4 points, while an eco-school pupil got average score 17.1 points. Also the difference between correct answers between the two groups was in favour of experimental group (Graph 1).Thus it may be concluded that the eco-school pupils' were in average slightly better in knowledge. Moreover, a low frequency of answers was detected in questions assessing knowledge between the control group.

4.2.2. Awareness

The study showed a low frequency of answers to the questions related to awareness. Almost half of the respondents proved to be passive observers of environmental problems and activities enabling them to reach their goals. About 10% of pupils per group failed to provide answers to all questions on awareness. It also seems that they are more locally aware than informed by the media about global problems.

The pupils are not aware of the different ways of handling inorganic and organic wastes (question 19). The results revealed that very few pupils (between 15.2% and 29.3%) were aware of human activities polluting their water sources and hence many pupils considered the water used in their homes to be clean. Hence pupils are significantly unaware of how their activities in the environment were affecting the quality of water from different sources.

Despite the fact that pupils are observant of their environments; some environmental problems are not easily identifiable by pupils. Some water pollutants are not directly observable and require analysis of the quality of water for their identification. Hence there are some environmental problems that may not be known to pupils because, by their nature, they are not directly observable. Pupils may perceive rain water as being clean because it appears to be clear and without visible solid materials in it. Nonetheless, it may be polluted, especially during harvesting and storage, by agrochemicals and microorganisms.

Notwithstanding the differences in knowledge, the research showed that the differences in awareness between the groups were not statistically significant. In order to assess and compare the levels of awareness between the control and experimental groups, i examined the means of individual variables. No major deviations from mean values were detected among groups. As for awareness, the mean in ordinary schools was higher in 17 cases and in eco-schools in 21 cases. Statistical analysis showed that the differences in behaviour between the two groups are not significant. It seems that the questions matched well with

the pupils' everyday life, because the average rate of answers in this part of the questionnaire (assessment of environmentally responsible behaviour) was almost100%.

The answers of both groups were very similar, but there are some slight differences that merit comment. First, we are aware that this kind of questionnaire does not show us a real picture of pupils' behaviour. All numbers (frequencies) are at least partially greater because of the effect of what is socially accepted. This means that from this data we can infer this effect not only on behaviour, but also on awareness and to some extent on knowledge as well. Interpretation is even more difficult because of the contradictory answers of both groups. Looking at the data, the experimental group is behaving slightly more pro-environmentally. About half the pupils from both groups never collaborate in any of the actions organized by their schools or local communities. Although not statistically proven, the level of responsible or pro-environmental

The test analysis showed that eco-school pupils were on average better when it came to knowledge, although after having examined their sample structure, I found out that their overall grades, as well as grades in natural sciences were on average higher in the control group. Considering this contradiction, it can be inferred that different approaches to class work may be taken in these groups, and above all that different knowledge and assessment criteria might be applied in the classroom.

4.3 Pupils Perceptions on the Environment

4.3.1 Pupils Perceptions on Human Activities Destroying the Forest
The questionnaire also interrogated whether the pupils were aware of human activities causing environmental degradation. The causes of deforestation, land pollution by garbage and water pollution were investigated. Pupils responded by ticking the human activities causing the specified environmental problem in their immediate environment and their responses were categorized. See Table 4.

Responses	Number of Pupils	Percentage
Human Settlement	85	42.5
Clearing Land For Farming	126	63
Wildfires	24	12
Cutting Firewood	120	60
Sale Of Timber	120	60
Charcoal Burning	181	90.5

Note: The responses are multiple and therefore do not add to 100%
Table 4: Pupils Perceptions on Human Activities Destroying the Forest (N=200)

Charcoal burning (90.5%) was the major factors selected but others were clearing land for farming (63%), the sale of timber (60%), cutting fire wood 60%) and human settlement (42.5%). The results show that the pupils are aware of the impact of human activities on their environment.

4.3.2 Pupils Perceptions on Human Activities polluting water sources

The results concerning whether pupils were aware of human activities polluting water from their sources are shown in Table 5.

Responses	Number Of Pupils	Percentage
Sewage	79	39.5
Fertilizers	56	28
Soil	42	21
Chemicals	81	40.5
Human Faeces	64	32

Note: The Responses Are Multiple and Therefore Do Not Add To 100%
Table 5: Pupils Perceptions on Human Activities polluting water sources (N=200)

The results revealed that very few pupils (between 15.2% and 29.3%) were aware of human activities polluting their water sources and hence many pupils considered the water used in their homes to be clean. Hence pupils are significantly unaware of how their activities in the environment were affecting the quality of water from different

sources. The results on whether pupils were aware of human activities that affect the scenic beauty of an environment, and pupils' awareness of common solid wastes affecting the scenic beauty of the environment.The number of pupils who identified the main human activities generating these pollutants as sewage and human faeces were 39.5% and 32% percent respectively. These observations indicate pupil misperceptions; they are unaware of how their activities in the environment were affecting the quality of water from different sources.

4.3.3 Pupils Perceptions on the effects of forest destruction

The questionnaire was also used to evaluate whether the pupils were aware of the effects of deforestation, poor solid disposal and water pollution taking place in their environment. Pupils responded by ticking the specific effects of the mentioned environmental problem, and their responses were categorized (See Tables 6 and 7).

Responses	Number Of Pupils	Percentage
Floods during rainy season	162	81
Outbreak of diseases	88	44
Reduction in amount of rainfall	197	98.5
Human wildlife conflicts	122	61
Disappearance of plant species	143	71.5
Soil erosion	199	99.5
Inadequate water	185	92.5

Note: The Responses Are Multiple and Therefore Do Not Add To 100%

Table 6: Pupils Perceptions on the effects of forest destruction (N=200)

The majority of the pupils identified soil erosion (99.5%) and reduction in amount of rainfall (98.5 %) as the major effect of destroying forest followed by inadequate water, floods during rainy season and disappearance of plant species. By contrast, few pupils also identified outbreak of diseases as effects of destruction of forest.

4.3.4: Pupils Perceptions of Problems Associated With Poor Solid Waste Disposal

The results on pupils awareness of effects of poor solid waste disposal are shown in Table 7.

Responses	Number Of Pupils	Percentage
Increase in water-borne diseases	126	63
Breeding ground for mosquitoes	146	73
Rusting of iron sheet roofs	77	38.5
Spoiling scenic beauty	162	81
Increased livestock diseases	105	52.5

Note: The Responses Are Multiple and Therefore Do Not Add To 100%

Table 7: Pupils Perceptions of Problems Associated With Poor Solid Waste Disposal (N=200)

The above results show that majority of the pupils identified spoiling of scenic beauty (81%) and the creation of breeding grounds for mosquitoes (73%) as problems associated with poor disposal of garbage; 63% also identified increase in water-borne diseases as an effect of poor disposal of solid wastes. Solid wastes hold water, hence creating breeding ground for mosquitoes. They also litter the environment and spoil the beauty of the environment. Thus, again, the responses by the pupils are plausible.

4.3.5 Pupils Perceptions of Diseases Associated With Lack of Clean Drinking Water

Responses	Number Of Pupils	Percentage
Malaria	96	48
Typhoid	196	98
Amoebiasis	67	33.5
Brucellosis	21	10.5
Pneumonia	83	41.5
Bilharzias	178	89
Influenza	50	25
Cholera	188	94

Note: The Responses Are Multiple and Therefore Do Not Add To 100%

Table 8: Pupils Perceptions of Diseases Associated With Lack of Clean Drinking Water (N=200)

The majority identified typhoid (98%), cholera (94%) and bilharzia (89%) as diseases associated with lack of clean drinking water. These responses by the pupils are correct since the pathogens that cause these diseases are found in polluted water. Though amoebiasis is a water-borne disease associated with polluted water, only a few pupils (33.5%) identified it. A few pupils had misconceptions that malaria, brucellosis, pneumonia and influenza are diseases associated with lack of clean drinking water.

4.3.6 Pupils Perceptions to the solutions of environmental degradation

The questionnaire was also used to investigate whether the pupils were aware of solutions to environmental degradation taking place in their environment. Pupils volunteered solutions to deforestation and ticked the best procedure for handling solid waste from given options. Pupils responses about the handling of solid wastes were categorized according to the selected opinion as follows:

• Putting organic and inorganic wastes in same waste bin
• Separating waste into organic and inorganic and then putting each in separate waste bins
• Using organic and inorganic wastes to make manure
• Separating the organic and inorganic wastes and using inorganic wastes to make manure and recycling organic wastes
• Separating the waste into organic and inorganic and using organic wastes to make manure and recycling the inorganic wastes.

4.3.7 Pupils Perceptions to the solutions of forest destruction

The results concerning pupils awareness of solutions to deforestation taking place in their immediate environment are shown in Table 9

Responses	Number Of Pupils	Percentage
Re-afforestation	149	74.5
Use of firewood instead of charcoal	39	19.5
Keeping livestock instead of crop farming	46	23
Planting fast growing trees for firewood	104	52
Use energy saving jikos for cooking	154	77
Use solar energy for cooking	168	84

Note: The Responses Are Multiple and Therefore Do Not Add To 100%

Table 9: Pupils Perceptions to the solutions of forest destruction (N=200)

The results revealed that many pupils considered use of solar energy (84%), energy saving jikos (77%) and re-afforestation (74.5%) as solutions to deforestation. Use of energy saving jikos, re-afforestation and use of alternative sources of energy like solar are some of the solutions to deforestation (AFEW, 2006). The responses by pupils are therefore valid solutions to deforestation since they aim at reducing the demand for wood energy and reforestation. These measures will reduce forest destruction and promote sustainable use of forests respectively. Therefore these pupils explanations are the appropriate solutions to deforestation. A few pupils (52%) identified planting of fast growing tree species for firewood as a solution to deforestation. This explanation is also correct because it ensures sustainable supply of firewood. Other responses given by the pupils were; use of firewood instead of charcoal (19.5%) and keeping livestock instead of crop farming (23)%). Firewood use leads to cutting of trees to get firewood while keeping livestock requires pasture land which is created by clearing forests.

4.4 Conclusions

Based on the results of this study it can be concluded that pupils are aware of the key environmental issues (deforestation, poor solid waste disposal and water pollution)

happening in their local areas. It can also be concluded they have knowledge about causes of deforestation and land pollution. Nonetheless, a majority of pupils were not aware of the human activities polluting their water sources. It can further be concluded they have knowledge about the effects of deforestation. Nonetheless, a majority of pupils were not aware of the human activities polluting their water sources. It can further be concluded they have knowledge about the effects of deforestation water pollution and poor waste disposal. It can also be concluded that that pupils have knowledge about the solutions to deforestation but are not sure of how solid waste (garbage) should be managed.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

What can be concluded about the distinction in environmental literacy between the two groups in the research? Has the eco-school project produced positive results? It should be emphasized that the study proved a statistically significant difference in knowledge between eco-school and ordinary schools. This is without a doubt a good sign and proof that eco-school pupils have made greater progress in this field but fails to promote environmentally responsible behaviour - although a positive influence in this area can nevertheless be seen.

5.2 Major Findings of the Study

Pupils should develop a positive attitude towards the environment, taking into account both humans and nature. In this way, future consumers, manufacturers and those involved in the decision-making process would become more sensitive to the environment. This statement implies that the way the school functions and how the general atmosphere in the school is, should simplify and enable pupils to overcome obstacles in the way of pro-environmental behavior. Personal factors such as motivation, knowledge, values, attitudes and awareness, as well as external factors, including economic, cultural and social, that construct and shape environmental literacy in its broader meaning, should all be taken into account.

Data analysis showed that the primary focus of eco-schools is still to organise activities which do not considerably change pupils' attitudes and behaviours (e.g. cleaning the surroundings, planting flower beds). This approach can be interpreted as "behaviouristic", bypassing pupils as a thinkers and decision-makers and not developing them towards critical thinking and action competence. In many cases such activities (collecting waste, taking care of plants in the schools, etc.) are managed by workers and thus they fail to encourage pupils to change their attitudes.

It may be concluded that non-eco schools fail to provide environmental education to students and this can only be attained by way of realistic, active class work oriented towards problem-solving. With such an approach, environmental education has a chance to encourage action competence in pupils, which is the basis for developing different behaviours and attitudes.

5.3 Recommendations

How could environmental education in eco-schools be improved?

1. Well defined programme

Quite a few researchers/authors have found that implementation of a good programme can lead to greater awareness and thus make environmental education more successful. Patrick Devine-Wright (Devine-Wright, Devine-Wright, Fleming, 2004) claims in his research that pupils who have attended a school with an organised and well-defined environmental education programme - what eco-schools should be - have reached higher level of awareness than those who have not been involved in organised work in this area.

2. Development of critical thinking competence

A U.S. study (Ernst and Monroe, 2004) proved that environmentally oriented education present throughout the entire education process improves critical thinking in other areas as well. It was established that the curriculum as a whole should include activities of dealing with simple situations and artificial problems, which are then gradually applied to real issues. The outcome of such gradual and long-term development of critical thinking is much more successful than dealing with one-off situations on a particular topic. This is also in accordance with Courtennay-Hall and Rogers (2002), who emphasised the importance of critical thinking competence against environmental behaviour.

3. The role of experiential learning

Littledyke (2004) claims that teaching should be focused on achieving environmental education by understanding environmental issues. This should be accomplished by gaining direct experience resulting from actual work in the environment and by receiving education that will help preserve the environment and form the values and attitudes

necessary to protect it. Education should include critical understanding of the impact of science on society. Therefore, it is important to systematically include environmental issues in class work.

4. Motivation

Gough (2002) recommends that environmental education consist of topics that children find interesting (animals, waste); this suggests a bottom-up organisation. Moreover, class work should be about concepts explaining the network of connections between causes and effects (goods - waste - energy). Empathy and care for animals and other living organisms should be fostered and (critical) thinking on appropriate measures promoted (If you were president, what would you do?). Role-playing should be used to detect impacts and consequences caused by environmental problems. Environmental education in such form could serve as the basis for a scientifically, environmentally and ethically (morally) educated society.

5. The role of adults

Negev, Sagy, Garb, Salzberg and Tal (2008) brought out the important role of teachers or other adults who mediate children's relationship to nature and have a crucial impact on attitudes and behaviours. It is also important for parents to be involved in education. They should take time together with their children to focus on activities that teach a child to develop awareness and responsible behaviour towards the environment. It should not merely be about sorting waste or energy efficiency, but also about renouncing the desire for material gain, striving for a healthy lifestyle, doing exercises, and adopting a critical attitude toward environmental "wounds", origins of pollution, consumption, spoiled individuals, etc. It is important to make children understand the meaning of leading an environmentally responsible life.

5.3 Conclusions

This research accomplished the goals set. It is my hope that its results would make people think and be useful in integrating Environmental Education Programmes in schools. It is now important to further consider and elaborate plans for greater efficiency and improvement of awareness and more responsible environmental behaviour in the long

run. Experience has taught us that the value of knowledge lies in its usefulness. Dealing with environmental issues in schools helps broaden and deepen knowledge of the environment, but fails to encourage logical and knowledge-based reflection on the causes and consequences of human activities affecting the environment. Therefore, it is necessary to observe and think more, rather than simply to learn facts. It takes inspiration to do research -in other words, curiosity and creativity at the same time. In order to achieve better results in awareness and environmentally responsible behaviour, we should move from simple accumulation of knowledge to taking action. Positive examples, (ecological) trends and taking on values will play a crucial role.

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APPENDIX I

14thSeptember,2010

Dear Respondents,

I am a student at the University of Nairobi, pursuing a Postgraduate Diploma in Project planning and Management.

I am carrying out a research study on Environmental Education which is a partial fulfillment of my course.It is my request that you support me; by responding to the questions contained in the attached questionnaire n order to enable me get the data that I require to complete the project.

Kindly indicate your name and age on the form and I promise to treat the information provided with utmost confidence.

Yours Sincerely,

Angela Simel
Administration No: l42/61101/09

APPENDIX II

INSTRUCTIONS

a. Please read each item carefully before answering the questions

b. All information given will be treated with confidence

1. Match the items

A Herbivore	1 Micro-Organism
B Decomposer	2 Chicken
C Producer	3 Caterpillar
D Carnivore And Herbivore	4 Wheat

2. The items from No. 1 are organized in a food chain. Which combination is correct?

a) A, B, C, D
b) B, A, C, D
c) C, A, D, B
d) D, C, B, A

3. What is the meaning of the concept "endangered species"?

a) Animals or plants which have lived in the past
b) Just a limited number of individuals of this species are alive
c) This animal or plant has replaced other species
d) Other_____

4. Match the item with its explanation

Genetics	science of relations between organisms in their environment
Ecology	science of heredity
Evolution	science of the development of species

5. Which are the optimal conditions for seed germination and plant growth?

a) Light and dry
b) Dark and Dry
c) Light and wet
d) Dark and Wet

6. Draw the symbol of 'recyclable'?

7. Write down an example where you have noticed degradation of the environment.

8. Which of the following factors is most responsible for climate change?
a) Large amounts of community waste
b) Use of pesticides
c) Industrial waste and wastewater
d) Use of fossil fuels

9. What is your opinion about future living conditions on the Earth?
a) Will be worse
b) Will be the same
c) Will be better

10. Put in order from 1 (very much) to 6 (not at all) your hopes about life

a) To be healthy
b) To live in a clean and organised environment
c) To be wealthy
d) To have a good job
e) To live in harmony with nature
f) That my needs correspond to my possibilities

11. What do you think - how serious are some problems? Mark from 1, very serious, to 5, not important

a) Air pollution
b) Water pollution, industrial wastewater
c) Food additives
d) Nuclear power plants, nuclear waste
e) Deforestation

12. How often do you think about environmental problems?
a) Often   b) Sometimes   c) Very rarely   d) Never

13. Describe what and where you have noticed degradation of the environment because of human actions

14. Which of the following problems are the most threatening? Mark from 1 to 3.

Ozone layer destruction
Water and sea pollution
Pesticides and other chemicals in food
Deforestation
Greenhouse effect
Nuclear waste

Acid rain

15.Which of the following human activities contribute mostly to the uncontrolled destruction of the forest? (Tick 4 of the most common)

 Human settlement
 Clearing land for farming
 Wild fires
 Cutting firewood
 Sale of timber
 Charcoal burning

16. What should people in your area do to conserve their forest? (Give at least 3 solutions)

17. Which problems are people likely to face in future because of destroying their forest? (Tick at least five problems)

 Floods during the rainy season
 Outbreak of diseases
 Reduction in amount of rainfall
 Human wildlife conflicts
 Disappearance of plant varieties
 Soil erosion
 Inadequate water

18.Which of the following diseases are associated with lack of clean drinking water? (Tick 4 only)

 Malaria
 Typhoid
 Amoebiasis
 Brucellosis
 Pneumonia
 Bilharzias
 Influenza
 Cholera

19.How should people handle both organic and inorganic wastes from their homes? (Tick one of the most appropriate)

Put them in the same waste bin
Separate and put them in different waste bins
Use them to make manure

Separate and recycle organic waste and use inorganic waste to make manure
Separate and use organic waste to make manure and recycle inorganic waste

20.Which of the following problems would you associated with poor solid waste disposal?
(Tick 3 of the most common)

Increase in water-borne diseases
Breeding grounds for mosquitoes
Rusting of iron sheet roofs in town
Spoil the beauty of the surrounding
Increase in livestock diseases

21.Which human activities have led to the low quality of water from your source(s)?
(Tick 3
of the most common)

Untreated sewage from homesteads
Fertilizers used in farming
Soil due to poor farming methods
Chemicals used in farming
Contamination by human faeces

22. Do you know of any international agreement about environmental protection?
a) No
b) Yes (which one?) _____