AN ASSESSMENT OF THE INCORPORATION AND THE TEACHING OF ENVIRONMENTAL STUDIES IN PRIMARY SCHOOLS IN MURANG'A DISTRICT

BY

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A PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF EDUCATION IN KENYATTA UNIVERSITY.
DECLARATION

THIS PROJECT REPORT IS MY ORIGINAL WORK AND HAS NOT BEEN PRESENTED FOR A DEGREE IN ANOTHER UNIVERSITY.

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DEDICATION

This work is dedicated to my dear wife Margaret Wangui Gathuru and to our daughter Heta Gathuru.
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This project would never have been completed without the help of many friends and to all I am greatly indebted. All cannot be mentioned here but only a few.

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This study assessed the extent of incorporation and the teaching of Environmental studies in primary schools in Murang'a district. The upper primary syllabuses were examined to identify topics on Environmental studies included.

Forty primary school teachers, eight from each of the five divisions in the district were selected using stratified random selection. Each teacher filled a questionnaire containing two parts. Part 1 assessed teachers' attitudes towards the environment and Environmental studies. Part II assessed the teaching of Environmental studies in primary schools. The findings of the study were quantified and expressed in percentages.

The examination of the upper primary syllabuses revealed that, a multi-disciplinary approach is used to teach Environmental studies. The disciplines containing Environmental studies are: Combined course (Geography, History and Civics), Agriculture, Science and Home Science.

The findings of the study showed that teachers in Murang'a district are aware of the state of the Environment and have positive attitudes towards the
environment. The majority of teachers agreed that concern for the environment should be a duty for every citizen. Most teachers agreed that environmental education should play the vital role of changing pupils' attitudes, values and behaviour with a view to making pupils respect, appreciate and protect the environment.

The study revealed that most teachers in the district frequently used the environment as a teaching resource. No textbook on environmental education was being used in primary schools visited. Most teachers had no training on how to incorporate environmental education into their instructional programmes. The problems faced by teachers included shortage of reference books, lack of finance to organize field trips and other problems.

Recommendations to ensure that environmental studies are effective in promoting environmental awareness and solving environmental problems include those to the inspectorate, curriculum developers, suppliers of teaching materials and the school community.

Recommendations for further research include an assessment of pupils attitudes towards the environment, research on whether pupils apply the knowledge acquired on environmental education after they graduate from primary schools and others.
Twentieth century will remain in history as the century when man rediscovered his relationship with the environment in its totality. No other century has witnessed so much money and time been utilized to organize conferences, seminars and workshops at national, regional and international levels to discuss threatening environmental problems. From 1960's a sort of rebirth or 'renaissance' of environmental quality's awareness took place especially in Western countries. Ecologists started to detect environmental degradation evidenced by death of marine life and extinction of species. Issues like pollution of air, land and water, deforestation and other environmental problems were highly published. Presently man is not only worried about nuclear bombs but also the deteriorating environment from which he derives his sustenance. Reporting on 14th Session of UNEP's Governing Council, Ofula Owuor (1987) said:

"We either save the environment or perish. Nations of the world must combine the efforts to curb the frightening destruction of their environment and ineffective use of the earth's resources which threaten the survival of future generations".

According to the Bible record, man was not created to destroy the environment which God had created and declared ---'it was very good'. The book of Genesis
records that the Lord God created man and put him in the garden of Eden --'to dress and keep it' (Genesis 2:15).

There is an interaction between living organisms and the physical factors of the environment. In the interaction living organisms modify the environment and adapt to it. The inter-relationship between living and non-living components of the environment and between the living things themselves has existed since life appeared on the earth. The way the factors of the environment regulate the populations of different species and the communities is referred to as the balance of nature.

Man unlike other organisms is not wholly under the mercy of the environmental factors. Aided by his high intellectual capacity man has colonized practically all ecosystems. Curiosity compelled the early explorers especially from European countries to venture to 'unknown' and 'dark' continents. The exploration of space in modern times, man landing on the moon and other manoeuvres show man's determination to colonize all the environments. In the process of colonization all the ecosystems have been contaminated to such an extent that survival of living things is threatened. Most of the ecosystems have been transformed and are no longer natural (Report of the Centre for Educational Research for Innovation, 1976). Forests have been transformed into agricultural lands and for human settlements while no sound environmental management is exercised.
The present and the future generations will depend on man's ability to work fundamental changes in the natural environmental (Herfindahl and Kness, 1965). The changes referred to by Herfindahl and Kneese are such activities as clearing forests, ploughing, construction of dams for irrigation and power generation, green revolution industrialization and others. These activities as they meet human needs such as food, energy and other needs destroy our environment as William Wordsworth says in a quotation by Nyamu:

"There was a time when meadow grove and stream, the earth and every common sight
Apparelled in celestial light
The glory and the freshness of a dream
It is now as it hath been of yore
Turn whereso'er I may
By night or day
The things which I have seen I now
can see no more"

William Wordsworth laments of meadow grove, streams and common sights disappearing but other environmental problems have already appeared. Examples of contemporary environmental problems are water pollution, the purposeful introduction into the environment of chemical substances such as pesticides, insecticides, preservatives, colouring agents and other chemicals, poor use of urban space and the rural countryside enchroachment into the world areas has occurred without due concern to the environment.
Most of the environmental problems are caused by modern technology and large populations. As the technological man's ability to control and modify the environment increase, the quality of those environments is sharply decreasing (Vivian, 1973).

Environmental problems caused by modern technology occur mainly in developed countries. In Kenya as in other developing countries poverty is the main cause of environmental problems, evidenced by rural and urban poverty, poor housing, slums, poor sanitation, deficiency diseases, deafforestation, soil erosion, wildlife destruction and other problems (NES, 1982). His Excellency President Daniel arap Moi mentioned some of these problems while addressing a Kenya's plant Communities in August 1984 in Nairobi:

"Our land and its great variety of plant and animal species is one of Kenya's greatest assets. These natural resources which are so crucial to the future well being of our nation are however under threat of desertification, destruction and even extinction."

Man cannot continue polluting the air, water and land for ever. Desertification, destruction and extinction of species will eventually cause extinction of life unless man changes his way of behaviour, and acquire positive attitudes towards the environment. Newbould (1973) states it plainly by proclaiming:
"Conserve or perish on the theme that unless man learns rapidly to limit his population growth, conserve his resources more fairly, he will not survive into the 21st century".

Writing about Ethiopia, Brown (1973) in the same year made a similar observation which can apply to Kenya as well:

"Actually I can see this beautiful and potentially productive country sliding towards early and complete environmental and consequently economic ruin".

Man's first time to deal with environmental problems at an international level was on June 1972 in Stockholm, Sweden during a United Nations Conference on the Human Environment. The theme of the Conference was "Mankind has only one Earth the finite resources and unitary life supporting system which were being overtaxed". The Stockholm conference declared that there was a close link between society and the environment and that relationship was at a critical stage. Delegates stressed the dangers posed by the environmental problems at their national and regional levels and the need to solve these problems and prevent future ones from arising. The international community at the Stockholm conference agreed that Nations of the world should practically participate in solving environmental problems at National level and stressed the need for regional and global co-operation in solving
environmental problems which go beyond national boundaries.

The Stockholm conference recognized the role environmental education should play in solving environmental crisis.

"Recommendation 96 of the Stockholm Conference on the Human Environment called for development of Environmental education as one of the most critical element of all-out attack on the world's environmental crisis". (UNESCO, Connect, 1976)

Environmental education is expected to produce citizens who are environmentally literate, who will have acquired the basic knowledge of, and concern for environmental problems, an awareness of what those problems imply and initiate elementary solutions necessary in environmental management.

As a member of United Nations Organization, Kenya was represented at Stockholm Conference. In response to the recommendations passed at the Conference, National Environment Secretariat (NES) was established in 1974 in the President's Office and was charged with co-ordination of all national environmental matters. The Secretariat was later transferred to the Ministry of Environment and
Natural Resources which was created in December 1979. The Secretariat was to work closely with Kenya Institute of Education (K. I. E.) in orientation of the education systems in order to stimulate action and behaviour leading to sounder environmental management. As a result of various workshops on Environmental education such as 'Kenyatta University College Environmental Education Workshop in 1979', Kenya National Symposium on Environmental Education and Training in 1979 and other workshops, new environmental studies have been added to the existing curricular, at primary, secondary and tertiary levels.

Background of the Problem

Murang'a is one of the five districts in Central Province. Other districts are Kiambu, Kirinyaga, Nyandarua and Nyeri. Murang'a district is divided into Kangema, Kiharu, Makuyu and Kandara divisions. The district is 914m to 3,353m above sea level. As a result of its topography and geology, the district is divided into four vegetational zones (see appendix A and B).
Zone 1:- Forest
Zone 2:- Wooded and Brushed Grassland
Zone 3:- Wooded Grassland
Zone 4:- Woodland mixed with Dwarf shrubgrassland.

Rainfall in the district is not equally distributed. Some areas in the eastern side receive below 500mm of rainfall while other high potential areas on the western side receive up to 1,600mm of rainfall. The whole district is drained by several rivers from the eastern upper reaches of Aberdares Mountains. These rivers form part of the upper Tana drainage system. The hilly nature of the district coupled with high population density has lead to accelerated soil erosion.

In 1983, Murang'a district's population was estimated at 648333. Young people whose age ranged from 0-14 years old comprised 32.86%. Although 261 per Km² in 1983 was taken to be the district's population density, Kandara division had a density as high as 430 per Km². The high population density in Muranga is causing greater demand for land and other natural resources.

Murang'a district is a high potential area and agriculture is the backbone of the district's economy. Peasant farming, accelerated land fragmentation, deafforestation, environmentally unsound developmental programmes make the district to experience many environmental problems such as soil erosion, desertification threat, pollution and other problems.
As in other districts in the country, free primary education has resulted in tremendous rise in enrolment of pupils in primary schools. In 1983 there were 212,729 pupils in 344 primary schools in the district. (Murang'a District Development Plan, 1983). In 1981 there were 5054 primary school teachers. Armed with positive attitudes towards the environment, this large group of teachers can play a very important role in propagating environmental awareness to the pupils who are the future farmers in the district (Murang's District Environmental Assessment Report, 1982).

**Statement of the Problem**

Environmental studies are expected to make pupils aware that man absolutely depends on the natural environment and the importance of man becoming aware of environments in various stages of deterioration. The studies are expected to provide pupils with knowledge, values, attitudes, commitment and skills needed to protect and improve the environment. Environmental education is generally expected to create new patterns of behaviour among individuals, groups and society as a whole towards the environment. Brezhnev the former President of Union of Soviet Socialist Republic (U.S.S.R.) in his welcome speech which was read on the opening day of the Intergovernmental Conference on Environmental Education convened in Tbilisi, Georgia (U.S.S.R.) said:
"--- and it is clear that development of a considerate and careful attitude to the environment together with dissemination of the knowledge and skills necessary for its protection and improvement should become an integral part of the general system of education and training, (Connect, 1978).

The Tbilisi Declaration required member states of United Nations Organization (U.N.O.) to introduce environmental concerns, activities and contents into the education system. The Kenya Institute of Education (K.I.E.) which is concerned with curriculum development for primary, secondary and teacher education in Kenya has managed to introduce environmental studies as part of the Science teaching programme (NES, 1982). Although it is reported that Environmental Studies have been incorporated into the primary school curriculum, no research has been done to assess to what extent the studies have been incorporated. In view of the role environmental studies are expected to play in solving current and future environmental problems in Murang'a district, this researcher felt that it was necessary to assess to what extent environmental studies have been incorporated into primary school curriculum; and the attitudes of primary school teachers in Murang'a district towards the environment and environmental studies. The researcher sought answers to the following research questions:

1. To what extent has the primary school curriculum incorporated environmental studies?
2. Which approach is used in teaching environmental studies in primary schools?

3. What resources are used by primary school teachers in teaching environmental studies?

4. What are the attitudes of primary school teachers in Murang'a district towards the environment and environmental studies?

5. What problems do primary school teachers in Murang'a district face while teaching environmental studies?

**Purpose of the Study**

The purpose of this study was to assess the extent to which environmental studies are incorporated into the primary school curriculum. The investigator intended to find out the topics included in the syllabuses for upper primary school section, which can create awareness about the environment and environmental management. The study also assessed the attitudes of primary school teachers in Murang'a district towards the environment and environmental studies.

The study examined the resources used by primary school teachers in teaching environmental studies. The study also investigated the problems faced by primary school teachers while teaching environmental studies.
Significance of the Study

Environmental studies should involve an individual in an active problem-solving process within the content of specific realities and it should encourage initiative, a sense of responsibility and commitment to build a healthy environment. Carson (1973) asks:

"Why are we concerned about environmental studies? The general position is that there are today countless men and women armed with means and the motive power to transform the countryside who lack entirely a knowledge of ecological principles and who in their ignorance can take action to damage irreparably natural resources and destroy our environment".

Men and women in Murang'a district have taken and are still taking actions in ignorance which have resulted to the existing environmental problems like soil erosion, population growth, environmentally unsound agriculture, encroachment of aridity especially on the south-eastern side of the district and other problems. Effective environmental management depend on a well informed public and so it is important that pupils in Murang'a district primary schools are given the opportunity to acquire environmental awareness through environmental studies. The studies will enable pupils to develop values, attitudes and skills which are necessary to enable them to relate changes in the living environment to the best interest of society and the environment.

A large proportion of students in Murang'a district like in other districts as well will only attend primary
schools without chances to proceed on with education. Primary school education therefore should give sufficient attention to the creation not only of attitudes but also of skills to solve environmental problems currently existing and future ones (UNEP, 1978). The terminal nature of primary education is also emphasised in Gachathi's Report, (1976).

"The present system of primary education is in fact a terminal form of education for the majority of Kenya children who will inevitably have to survive on means related to that level of education".

To ensure that pupils not proceeding on with education beyond standard eight benefit from environmental education, it is important that those concerned with education and the environment, understand the extent environmental studies have been incorporated into the primary school curriculum. This study is expected to provide that information, especially to the curriculum developers and National Environment and Human Settlement Secretariat which is expected to co-ordinate all matters of environment in Kenya.

Teachers as facilitators of learning process are very important in assisting pupils to acquire positive attitudes towards the environment. Even if the curriculum developers were to include all the relevant topics on environmental studies in the primary school curriculum,
Teachers as implementers of the curriculum are the determiners of the success or failure in achievement of the expected goals. When the teachers possess environmental awareness, values, attitudes, knowledge, skills and the will to solve problems affecting the qualities of their environment, they can be expected to give environmental studies the required emphasis as they teach. As attitudes play a great role in one's behaviour, this researcher felt that it was important to assess the attitudes of primary school teachers in Murang'a district towards the environment and environmental studies and to suggest areas that need improvement.

Teachers can succeed in imparting environmental awareness in their pupils only when they possess a positive attitude coupled with teaching and learning resources, like textbooks, and aids such as films, charts and others. The study aimed at assessing the resources used by the primary school teachers in teaching environmental studies with a view of recommending further resources which can be included in the curriculum in the future.

The findings of this study will be significant to the curriculum developers and the National Environment and Human Settlement Secretariat as it will suggest ways of improving the teaching of environmental education in primary schools and in pre-service and in-service training of primary school teachers.
Assumptions of the Study

Murang'a district is divided into four ecological zones as was mentioned in the introduction. Not all teachers in primary school in Murang'a were involved in this study, and not all the teachers involved were trained. In carrying on this project, this researcher made the following assumptions:

1. Teachers in different ecological zones in Murang'a district would have similar attitudes, (either positive or negative) towards their respective environment.

2. The sampled teachers would honestly and correctly fill the questionnaires.

3. The findings would be representative of Murang'a primary school teachers.

4. The findings of this study from Murang'a district would be generalized to other districts as well where such a study has not been carried out.

Limitation of the Study

This study was limited to selected upper primary school teachers in Murang'a district. The selected teachers were teaching, science, Agriculture, combined course (Geography, History and Civics), Home Science and Arts.
and crafts. This researcher limited this study to an assessment of the environmental studies incorporated into the primary school curriculum and the teaching of environmental studies which is influenced by the teachers' attitudes and the availability of resources.

The study did not investigate the attitudes of pupils and Head teachers of primary schools in Murang'a district towards the deteriorating environmental quality. The study would have produced better results if graduates from primary schools in Murang'a district especially those who did not proceed on with education were studied to find out whether they acquired positive attitudes towards the environment after going through school and whether they were participating in solving environmental problems in their respective areas.

Definition of Terms

The following are definitions of terms and abbreviations as used in this study.

Ecosystem: A natural complex made of living organisms and non-living environment interacting to form a stable and self sustaining system with exchange of materials and energy.

Environment: The aggregate of the surrounding things, that is, the living and non-living things
and the conditions that influence the life of an organism or population including humans.

Environmental education: The educational process that deals with the human interrelationships with environment, and that utilizes an interdisciplinary problem-solving approach with value clarification. Environmental education is concerned with educational progress of knowledge, understanding attitudes, skills and commitment for environmental problems and considerations. Environmental education is continuous and life-long (UNESCO, 1983).

Environmental Studies: Programmes and courses that deal with environmental problems on a broad interdisciplinary approach. Environmental studies utilize disciplines from the natural sciences, social science, applied sciences and humanities towards a general approach. (UNESCO, 1983).

G.H.C.: Geography, History and Civics (Combined course).

N.E.S.: National Environment Secretariat. It is currently referred to as 'National Environment and Human Settlement Secretariat (N.E.H.S.).
Summary

This chapter has explained how man in his manouevres, has colonized all ecosystems and in the process, the natural state of these ecosystems has been spoiled. The disturbance of ecosystem has resulted to the existing environmental problems which threatens man's survival today.

Man in this twentieth century has re-discovered his relationship with the environment, consequently, many conferences, seminars and workshops have been organized since early 1970s. These meetings were organized to find solutions to environmental problems. The first international conference (The Stockholm conference, 1972) on Human Environment recognized environmental crisis.

Murang'a district is experiencing many problems and the environmental studies incorporated into the education curricular are expected to enable the school leavers to conserve the environment and to prevent future environmental problems.
This study, guided by five research questions assessed the incorporation and the teaching of the environmental studies in Murang' a district primary schools. The significance and the purpose of the study had been given. The need for the teachers as curriculum implementers, to possess positive attitudes towards the environment and environmental studies to enable the success of environmental education, has been emphasized in the chapter.

The limitation of the study, assumptions and the definitions of terms and abbreviations as used in this study were given.
CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

This chapter is a review of literature written on Environmental studies or Environmental Education (EE). Environmental education has received great emphasis since 1970's after the International Community realised the role education can play in environmental management. Not much has been written on Environmental Education and no research on environmental studies has been done in Murang'a or any other district in the country. The Literature cited in this chapter are mostly papers presented at conferences, seminars, and workshops on Environmental education. The researcher has also cited some publications by UNEP, UNESCO, newspapers, textbooks and other relevant literature.

Education for Social Change

The school has been regarded as the social invention to serve social need. One of the tasks of education is to hand on the cultural values and behaviour patterns of the society to its young and potential members of the society. To provide for change is the creative function of education. Education is expected to play a great role in social reconstruction, cultural change, social integration, rural regeneration development of individual's excellence, social philosophy and other roles (Ottaway, 1966); In his book Education for Social Reconstruction Ukeje says:
"It is the role of education to promote participation in social improvement, to influence people's ways of doing things to be in accordance with the changing times, to improve the standard of living, to show ways of preventing sickness and practising sound habits of health, sanitation, nutrition, develop attitudes and habits necessary for adjustment to technology."

Environmentally, the whole world is in a state of want and so education cannot be for knowledge's sake but more specifically it ought to be education to help man to understand his environment adjust to environmentally sound technology. Nichoff (1977) says that:

"In a world of want education must be something far more restrictive and practical as a means of improving living standards rather than an end itself."

When the current environmental problems are taken as evils perpetuated by men, Plato sees the solution to be the school when he mentions that:

"No man does wrong knowingly, it is from ignorance that evil stems and the school can best encourage virtue by concentrating on knowledge and virtues."

Unfortunately the role education is expected to play in environmental management came into limelight only recently (late 1960's and early 1970's) after the International community began to be aware that environmental problems were threatening man's survival both directly and indirectly.
Environmental Education as a Long-term Solution to Environmental Problems

Man has interacted with his environment since life appeared on earth and his way of life has been determined to a great extent by the factors of the environment. Agricultural economy, nomadism, fishery and other economies are determined by the prevailing environmental conditions. In his struggle for survival, man has changed or modified the environment mostly to his detriment. Environmental impact by man's activities has reached its maximum with the present technological society as is stated in Connect (UNESCO/UNEP, 1976):

"Our generation has witnessed unprecedented economic growth and technological progress which while bringing benefits to many people have also caused severe social and environmental consequences".

The environmental consequences referred to above are such issues as soil erosion, deforestation, environmental illnesses, desertification, extinction of plant and animal species, water and air pollution and other problems which all cause deterioration of environmental quality. The worsening of the physical environment which threaten sustainable yield of food and other natural resources call for reform of world order, ethics and new approach to development. Kenya like the rest of the world has become aware of the pressing environmental problems as stated by His Excellency the President of Kenya in 'Voices in Defence of the Earth'
"Throughout this decade the Republic of Kenya has been aware of the increasing need to pay attention to environmental phenomena and stress. Our aim is to integrate environmental considerations into Development Planning". (Moi, 1982).

It is important that the policy makers as well as the general public realise that the effectiveness of environmental decisions depend to a large extent on the level of awareness of the citizens involved. Since industrial revolution, laws have been passed with an aim of protecting the environment as well as people from environmental illnesses. Nations, Voluntary Organizations and international bodies have involved people in conservation measures. Here in Kenya during 1920's and 1930's the European settlement led to land clearance, the introduction of intensive farming, plantation crops and concentration of natives in then called "native" areas. All these activities led to more forest clearance and increased pressure on soils through shorter fallow periods. Deforestation and unsound peasant farming caused severe soil erosion which prompted the colonial government in 1940's to introduce measures to urgently conserve soil in Central, Eastern and Western provinces where soil erosion was critical. The Africans were communally forced to cut terraces to stop soil erosion. Unfortunately, use of force in digging terraces and latrines without adequate explanation on the benefits of doing so, resulted to apathy and resistance, as mentioned in Murang'a district Environment report, (1982):
"although the purpose of the policy was good, the colonial approach was considered brutal and the enforced construction of terraces was at its height during struggle for independence".

In his opening address during the 'National Symposium on Environmental Education at Kenyatta Conference Centre in 1979, Towett the then Minister of Education mentioned the failure of the former measures to protect the environment and suggest the cause of failure:

"Strict policies and legislation for the preservation and improvement of the environment in many countries has failed to achieve the desired effect. This is partly due to the fact that the role of education is often neglected".

President Moi (1982) also sees effective programme of information and education as the prerequisite to effective environmental management.

"The ultimate achievements in this context of sound environmental management will only be achieved when appropriate values are instilled into the minds of people. Towards this goal we must rapidly introduce more effective programme of information and education."

Geddes in 1889 tried to show the connection between quality of environment and the quality of education. He explained that environmental awareness makes a student to learn better and develop creative attitudes towards the surrounding. Geddes is regarded as the
founder of environmental education. It wasn't until 1965 when Environmental education was heard for the first time and there was an emphasis later that it should be introduced to all citizens.

In 1968 the then Swedish Ambassador to United Nations Organization proposed to the organization the need to discuss measures to protect global environment and suggested Stockholm in Sweden to be the venue of the conference. From 5th June 1972 the United Nations Conference on the Human Environment was held in Stockholm. The conference was man's first attempt to deal with environmental problems on global basis. It was at the Stockholm conference that the International Community recognized the role of Environmental education in solving environmental crisis. Many recommendations were passed at the conference with recommendation 96 calling for development of Environmental education:

"Recommendation 96 of the Stockholm conference on the human environment called for the development of Environmental Education as one of the most critical elements of an all-out attack on the world's environmental crisis".

The establishment of a United Nations in Environmental education according to the recommendation of the United Nations General Assembly is one of the potentially positive outcome of the United Nations Stockholm Conference, (Withrington, 1977). UNESCO was
entrusted with the role of establishing an International programme in environmental education by the United Nations General Assembly.


Environmental education is for all ages and levels, interdisciplinary and holistic problem oriented, continuous and life-long as Stapp (1974) says:

"It is important to assist each individual whether urbanite, suburbanite or ruralite to obtain an understanding of the environment, its related problems and the surrounding land. It is important to provide an opportunity and informational tools for individuals so that they may be effective in working towards the solution and prevention of environmental problems. This approach designed to reach citizens of all ages is called Environmental Education."

The aim of Environmental education is to inculcate awareness and commitment on the part of the general public for the need to preserve the environment and appreciate the interrelationship between the environment and man in his socio-economic setting. The environmentally educated citizen as Trost (1972) says must:

"1. have some basic knowledge of ecological concepts and facts.
2. have a basic knowledge of socio-ecological problems of urban environment.
3. understand his relationship with the natural world."
4. have an understanding of abnormal ecology and over-population.
5. develop a vigorous interest in local state and national politics which bear heavily upon ecological problems.
6. learn to make decisions based upon the best available evidence after detailed analysis."

Nationally, Environmental education must ensure that every citizen of Kenya, adults and children alike are made to realise that indiscriminate use of our scarce resources has long-term adverse effect on our environment. When introduced into the mainstream of education, Environmental education can systematically promote environmental awareness in young people.

Environmental education is expected to create positive attitude in all people, towards the environment. The root cause of the environmental crisis is not population growth, industrial growth, economic and political systems, but human attitudes and values which motivate human decisions. Attitudes are fundamental to dynamics of behaviour. They largely determine student's not only willingness to study environmental issues but his use of environmental knowledge as well. Swan (1974) states:

"It is clear today that environmental education programmes are directed towards the development of attitudes, values and behavioural skills in the area of environmental-decision making and problem solving".
The International Community agrees that the goal of environmental education should be:

"...to develop a world population that is aware of and concerned about the environment and its associated problems and which has the knowledge skills, attitudes, motivations and commitment to work individually and collectively towards solutions of current environmental problems and the prevention of new ones".  
(UNESCO, 1981)

When one considers the magnitude of the current environmental problems and the threat they pose to the survival of living things (man included), one can accurately conclude that the need for environmental education has never been greater nationally and internationally, prompting international conferences, seminars, workshops on Environmental education such as:

1. The Stockholm Conference (United Nations Conference on Human Environment) of June 1972, which is of tremendous importance because Environmental education came to prominence and consequently the need for global strategy for Environmental education was emphasized. The Stockholm Conference saw the creation of the United Nations Environmental Programme (UNEP) whose headquarter is in Nairobi.

2. A pilot seminar (Mombasa Seminar) for African region was held in 1974 October. The Mombasa Seminar on Environmental education was to consider issues raised at Stockholm Conference and identify possible
strategies for programme development within various regions. The seminar investigated possibilities for development of Environmental education programme for Africa based on existing programmes available elsewhere.

3. In 1975 a UNESCO/UNEP sponsored workshop was held in Belgrade Yugoslavia. At the Belgrade workshop, Belgrade charter was drawn outlining new approaches to development and giving guidelines for establishing a global framework for Environmental education, giving goals, objectives and guiding principles for Environmental education. It was at the Belgrade workshop where the International Environmental Education Programme (IEEP) was created.

4. In 1976, an African regional conference on Environmental education was held at Brazzaville (Congo). The conference discussed strategies for developing Environmental education in the African region and at the same time refined the Belgrade recommendations on the light of regional realities.

5. In October 1977 the International Conference on Environmental Education was held at Tbilisi (USSR). Regional meetings such as Brazzaville Conference formed the basis for the preparation of Tbilisi Conference. The strategies for the promotion of Environmental education programmes and activities at National and International levels were discussed. The Tbilisi Conference adopted a holistic approach
to teaching of Environmental education rooted in broad interdisciplinary base. This approach expected environmental education to create an overall perspective which acknowledges that the natural environment and the man-made one are profoundly inter-dependent.

Development of Environmental Education in Kenya

Environmental education is not new to Kenya's education system. Many disciplines taught (Before the Stockholm Conference) at primary secondary and tertiary levels contained elements of environmental education as is stated in the 'Kenya Country Position Paper at Tbilisi Conference, (1977):

"Environmental education was been taught in Kenyan primary, secondary and tertiary schools before 1972's Stockholm Conference. The courses were been offered as integral part of subjects as Geography, General Science, Biological Sciences etc".

Although environmental studies were included in Kenya's education curricula, it was found that students were studying "from" the environment, "in" the environment but not "for" the environment as well. That education, failed to sensitize or motivate the youth in schools and the public at large about the need to care for the environment. Saitoti (1979) attributes the failure to:

"1. Lack of interdisciplinary approach in various subjects taught in schools where the subjects are taught in isolation."
2. teachers having a limited knowledge due to their inadequate training in the field.
3. wrong approach especially in educating the masses".

Kenya as a member of United Nations Organization has participated in all International Conferences, Seminars, Workshops and Symposia organized at regional and global levels to discuss Environmental Education. To comply with regional and global resolutions, Kenya has gone far ahead in introducing Environmental education in primary, secondary and tertiary levels of education. Saitoti (1979) has identified various factors that have influenced the development of Environmental education in Kenya. Among these factors are:

1. The United Nations sponsored Conferences and workshops organized in various regions of the world like the Stockholm, Belgrade, Tbilisi, Brazzaville Conferences.
2. Kenya's own conferences and workshops on environmental education such as the National Symposium on Environmental education in 1979 organized by the National Environment Secretariat and Kenyatta University College to discuss strategies for developing more and efficient Environmental education. The symposium was meant to be a follow-up of the Tbilisi conference. On the same year (1979) a workshop on Environmental Education for practising teachers was organized by Kenyatta University College.
The workshop looked at the ongoing Environmental Education programmes in formal education and how to improve these programmes.

3. The National Environment Secretariat which was established in 1974 has played a major role in assisting in the introduction of environmental education system. The Secretariat has worked closely with the Kenya Institute of Education in developing curricula oriented towards Environmental education, as stated by NES (1982):

"The Kenya Institute of Education is most fundamentally concerned with curriculum development at all levels of teaching. At the primary stage now K.I.E. has managed to introduce Environmental education as part of Science teaching programme."

In developing curricula incorporating environmental studies, the K.I.E. is guided by the following environmental education principles:

1. Environment should be treated in its totality.

2. Environmental education must be a continuous process starting from pre-school level.

3. The content must cover national, regional and global environmental issues.

4. Environmental education must focus on current and evolving environmental situation.

5. Environmental education should relate
environmental aspects to local and national development.

6. The environment should be the over-all resource.

7. The ability to observe the emerging problems and offer possible solutions.

Environmental Education in Primary Schools in Kenya

Kenya like many developing countries has succeeded in providing most children with primary school education. The Kenya government through the Ministry of Education has given great emphasis to creation of positive attitudes towards the environment in primary school children through formal education. Saitoti (1979) giving the importance of environmental education at primary school level states:

"Introduction of Environmental Education at this level would have a great impact to the future generations because it would assist in forming the right attitudes about the environment."

As future adults, primary school children need environmental education to assist them in the future, in making decisions, which will not affect the environment and as such they need to be assisted inorder to acquire the experiences, knowledge and concern, necessary in making informed environmental decisions.
One of the aims of the Primary school education is to develop awareness and understanding of pupil's immediate environment. It is hoped that the new curriculum (8-4-4 system) is sensitizing the pupils enough in order to make them aware of the environmental problems in their surroundings and provide practical solutions to solve those problems and to prevent future ones.

Many words have been spoken in conferences, seminars workshops and symposia organized at national, regional and international levels to discuss environmental problems and the incorporation of environmental studies into the existing education curricula. What remains is an action towards that direction according to Potter (1977):

"---- I must stress that I believe that not only words but actions will be required if environmental education is to be established universally and at all levels".

Like all sound educational reforms environmental education in Kenya requires serious planned assessment and evaluation in order to provide planners, curriculum developers, trainers, policy makers and other educators with necessary information for making effective and viable decisions about environmental education at all levels (Koech, 1986) This researcher in this study aimed at assessing the incorporation and the teaching
of environmental studies in primary schools in Murang'a district.

Summary

The literature reviewed shows that in this age of deteriorating environmental quality, education has a role to play in making pupils aware of the conditions of their environment. Environmental educations makes people realize that indiscriminate use of natural resources has a long-term adverse effect to our environment. Environmental education should of necessity be introduced in all levels of education system. Various national, regional and international conferences have been organized in various countries of the world to discuss the establishment of Environmental education in the existing education system. The Kenya Institute of Education has (through the assistance of National Environment and Human Settlement Secretariat) introduced Environmental studies into the primary school curriculum. There is a need to assess to what extent environmental studies have been incorporated into the primary school curriculum.
CHAPTER 3

DESIGN OF THE STUDY

Introduction

This chapter describes the methodology used in this study to assess the incorporation and the teaching of the environmental studies in Murang'a district primary schools. The study sought answers to the following research questions:

1. Are environmental studies incorporated into the primary school education curriculum?
2. What are the attitudes of primary school teachers in Murang'a district towards the environment and the environmental studies?
3. Which resources are used by primary school teachers in Murang'a district in teaching environmental studies?
4. What problems do primary school teachers in Murang'a district face while teaching environmental studies?

Population of the study

The population in this study was made up of primary school teachers in Murang'a district. However owing to the large number of teachers in the district and
shortage of time allocated to this study the researcher selected a sample of forty teachers. Stratified random selection was used in this study to get a representative sample. Two schools were selected from each of the five divisions in the district making a total of ten schools. To remove bias, the Headteacher of each school, selected four teachers from his/her staff teaching upper primary classes either Science, combined course (Geography, History and Civics), Agriculture, Home Science or Arts and Crafts. Table 1 below shows the schools in Murang'a district visited in this study.

Table I

Primary Schools in Murang'a District visited in This Study

<table>
<thead>
<tr>
<th>DIVISION</th>
<th>PRIMARY SCHOOL</th>
<th>ENROLMENT (1987)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIGUMO</td>
<td>Maragua</td>
<td>1136</td>
</tr>
<tr>
<td></td>
<td>Mutunguru</td>
<td>724</td>
</tr>
<tr>
<td>KANGEMA</td>
<td>Muruguru</td>
<td>1450</td>
</tr>
<tr>
<td></td>
<td>Mukarara</td>
<td>600</td>
</tr>
<tr>
<td>KANDARA</td>
<td>Gatanga</td>
<td>1192</td>
</tr>
<tr>
<td></td>
<td>Mukerenju</td>
<td>1380</td>
</tr>
<tr>
<td>KIHARU</td>
<td>Maragi</td>
<td>871</td>
</tr>
<tr>
<td></td>
<td>Koimbi</td>
<td>913</td>
</tr>
<tr>
<td>MAKUYU</td>
<td>Muthuri</td>
<td>448</td>
</tr>
<tr>
<td></td>
<td>Kiama</td>
<td>485</td>
</tr>
</tbody>
</table>
Procedure

Before going to the field the researcher examined the upper primary school syllabuses to find out the extent to which environmental studies have been incorporated into the primary school curriculum. Each discipline was individually probed and topics (written in the syllabuses) which could impart information related to the environment, recorded.

As all the subjects in the primary school curriculum are compulsory for all students, multidisciplinary approach to teaching environmental studies ensured that all students had an opportunity to acquire environmental awareness. Although multidisciplinary approach is also used in secondary, schools, all subjects are not compulsory for all students consequently some students miss some aspects of environmental education as they fail to study some subjects.

The construction of a questionnaire and writing of a research proposal were done after examining the syllabuses. Since time for the research was limited the M.ED. (T.D.C.) programme co-ordinator gave the researcher a tentative introductory letter to enable the researcher to collect data, while awaiting for the official permission from the President's office. From the middle of June 1987 the researcher went to
Murang'a district to collect data. The researcher started by getting official permission from the District Education officer who indicated on the tentative letter that he had authorized the researcher to visit primary schools in Murang'a district to do this study.

Method of Collecting Data

The researcher visited an average of two school per day because the selected schools were far apart and the researcher was using public means of transportation. In the school the researcher would talk first to the school Headmaster or Headmistress requesting for permission to carry out a research in his or her school. After a brief explanation the school head teacher would then select four teachers teaching either combined course, Science, Agriculture, Home Science or Arts and Crafts in upper primary.

The researcher would explain to the selected teachers the aim of the study and how to fill the questionnaires. After explanation the researcher then administered the questionnaire. The teachers were given enough time to fill the questionnaires and the researcher availed himself incase individual teachers needed further explanation on individual items in the questionnaire. The process of filling the questionnaires took place in either the staffroom or empty classroom.
The questionnaires were collected after every teacher had filled his or hers to individual's satisfaction. This method was followed in all the ten schools visited and at the end of the data collection process, the researcher managed to collect a total of forty filled questionnaires to be used later in data analysis.

Data Gathering Instrument

For this study, the researcher used a questionnaire divided into two parts. All the selected teachers were expected to fill both parts. The researcher felt that the teachers would be reluctant if requested to fill two separate questionnaires one after the other, so the researcher preferred two questionnaires in one. Part I of the questionnaire assessed the attitudes of the teachers towards the environment and environmental studies. Part II assessed the teaching of environmental studies and the problems teachers face in the process of teaching environmental studies.

To assess the attitudes of the teachers, Lickert-type scales were included in part I of the questionnaire. The scales were found by the researcher to be relatively better and the responses were easier
to analyse in percentages. However, although Likert scales use five responses (strongly agree, agree, neutral, disagree and strongly disagree) the researcher avoided 'neutral' response so he used four responses instead of five. Without neutrality, the researcher felt that the teachers would avoid the tendency of neutral responses in most of the items.

Field Problems

Like most researchers, the researcher faced various problems in the field. Some head teachers of the schools visited were suspicious of the motive of the researcher. As some of the visited schools were heavily eroded, the head teachers suspected that the researcher was sent to such schools by the Ministry of Education and they feared the consequences. The researcher explained to such headteachers that the study had nothing to do with the Ministry of Education but it was a Kenyatta University's requirement for all M.Ed. (T.D.C) students. The researcher told them that the results of the study were purely for statistical purposes.

The study took place simultaneously with district's zonal mock examinations. In some of the schools visited,
the required teachers were not available as they had gone to some centres to assist in setting zonal mock examinations. That, somehow, delayed data collection process as the researcher had to re-visit these schools another day.

Murang'a district is hilly and the selected schools to be visited were distantly isolated. The topographical aspect of the district made the researcher walk long distances, crossing valleys and climbing hills to reach some schools especially where public means of transportation were not readily available.

Method Used in Data Analysis

For every item in Part I of the questionnaire, the researcher recorded the responses in a Tally sheet. From the tally sheet, the researcher calculated the percentages from the frequencies obtained.

Part II of the questionnaire which contained Yes/No variety of items, were analysed separately from Part I items. Parts of the items in Part II required teachers to write their responses in spaces provided. The researcher used percentages and tables of responses to analyse items in Part II.

This study was a fact finding one consequently no hypotheses were formulated before the study commenced.
and so hypothesis testing was not applied in data analysis.

**Summary**

The chapter described the method used to assess the teaching of the environmental studies in Murang'a district primary schools. The study sought answers to four research questions. In an attempt to answer these questions, the researcher sampled forty teachers in Murang'a district to fill the questionnaires. Modified Likert-type scales were included in Part I of the questionnaire while a semantic differential scales were used in part II. Percentages and tables of responses were used in data analysis.
CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

Introduction

This chapter presents an analysis and interpretation of the data collected in the study. In the first section, the incorporation of environmental studies into the primary school curriculum is analysed. The upper primary syllabuses are probed individually in order to identify the topics on environmental education. In section two the attitudes of primary school teachers towards the environment and environmental studies are assessed using modified Likert scales included in part I of the questionnaire. The resources used by the teachers in the district and the problems they face while teaching environmental studies are assessed using part II of the questionnaire. The findings of the study are presented by the use of tables.

Environmental Studies Incorporation into the Upper Primary Syllabuses

The upper primary syllabuses were examined to determine the extent to which environmental studies are incorporated into the school curriculum and the approach used in teaching environmental education in primary schools. The examination revealed that a multi-disciplinary approach was employed where different topics from environmental studies were distributed to the existing disciplines. Table 2 below shows the disciplines which incorporated environmental studies.
**TABLE 2**

Disciplines Containing Environmental Studies in Upper Primary Schools:

<table>
<thead>
<tr>
<th>DISCIPLINE</th>
<th>OBJECTIVE RELATED TO ENVIRONMENTAL EDUCATION</th>
<th>ENVIRONMENTAL STUDIES INCLUDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRICULTURE</td>
<td>To develop self reliance, resourcefulness, problem solving ability and occupational outlook in agriculture.</td>
<td>Land Use: Best use of available land</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Sources: Uses and water conservation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trees: How to plant trees and care for them.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Erosion: Agents of soil erosion, factors influencing soil erosion, soil conservation.</td>
</tr>
<tr>
<td>COMBINED COURSE (Geography, History and Civics)</td>
<td>The learner should be able to identify problems in his environment.</td>
<td>- Resources and economic activities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Physical environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Forestry:- Uses, conservation, forest industry.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Wildlife:- Economic importance conservation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Tourism</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The people of our province and nation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Economic activities in Kenya and the rest of Africa e.g. high</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aswan Dam, Volta river scheme.</td>
</tr>
<tr>
<td>DISCIPLINE</td>
<td>OBJECTIVE RELATED TO ENVIRONMENTAL EDUCATION</td>
<td>ENVIRONMENTAL STUDIES INCLUDED</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Migrations in Kenya: reasons and effects of migration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Natural Resources: Soil types, uses, courses of soil erosion, soil conservation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water: Uses, sources, sources of pollution.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Forests: Uses, tree planting, conservation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kenya National Parks and reserves.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agriculture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Positive and negative effects of industrialization.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Urbanization and problems of urban growth.</td>
</tr>
<tr>
<td>HOME SCIENCE</td>
<td>Learners will be able to make appropriate decisions individually and collectively on selection and use of the available resources and services in the community in relation to home and family living.</td>
<td>Safe water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Household pest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poisonous substances in the home.</td>
</tr>
<tr>
<td>DISCIPLINE</td>
<td>OBJECTIVE RELATED TO ENVIRONMENTAL EDUCATION</td>
<td>ENVIRONMENTAL STUDIES INCLUDED</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------</td>
</tr>
</tbody>
</table>
| SCIENCE    | Pupils to acquire and preserve certain useful attitudes about themselves and their relationship with the environment. | - Methods of refuse disposal:  
- burying  
- burning  
- compost pits  
- feeding to animals  
- garbage collection  
- Soil: Types of soil drainage, soil erosion and its control.  
- Energy: Conservation imported jikos.  
- Environment: Components  
- pollution  
- Conservation  
- making good use of waste materials.  
- recycling of materials.  
- Living things. |

Some disciplines which aimed at preparing pupils to appreciate and enjoy the environment did not include topics related to environmental education although, some stated objectives implying such inclusion. For example:

1. **Physical education**: One of the objectives of teaching Physical education in primary schools is to make
pupils able to participate in outdoor pursuits inorder to explore and appreciate the environment and hence be aware of the natural resources and inspiration it offers.

2. Arts and Crafts: One of the objectives of teaching Arts and Crafts in schools is to make pupils exhibit self-expression of their immediate environment.

There was found to be duplication in the syllabuses examined since some topics were included in more than one discipline. An example of such topic was soil erosion which appeared in Combined course, Agriculture and Science Syllabuses. With co-ordination the curriculum developers could place such topic in one discipline and that could create more time for indepth coverage of other topics on environmental education in other disciplines.

Teachers were expected to use the environment as the main teaching resource in all the disciplines. That would enable the teachers to seize any available opportunity to emphasise to the pupils the importance of the environment and the need to conserve it. In that case all the disciplines in the primary school could be engaged in propagating environment awareness in the pupils. However, the use of the environment as a resource may depend on how teachers view the environment. The attitudes of teachers toward the environment are therefore important in implementing environmental studies.
Teachers' Attitudes Towards Environment and Environmental Studies

The research also assessed teachers' attitudes towards the environment and environmental studies. The findings of that assessment are presented in Table 3 below.

**TABLE 3**

Teachers' Responses to The Questionnaire On Attitudes Towards The Environment and Environmental Studies:

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>STATEMENT</th>
<th>FREQUENCY/PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Our environment is being spoiled by soil erosion, deforestation, pollution and other environmental problems.</td>
<td>STRONGLY AGREE: 28 (70%)</td>
</tr>
<tr>
<td>2</td>
<td>All citizens should be concerned about these environmental problems</td>
<td>STRONGLY AGREE: 26 (65%)</td>
</tr>
<tr>
<td>3</td>
<td>Active participation in protection of the environment should be a duty of every citizen in Kenya.</td>
<td>STRONGLY AGREE: 25 (62.5%)</td>
</tr>
<tr>
<td>4</td>
<td>Education in the primary schools should play a vital role in imparting environmental awareness in primary school pupils.</td>
<td>STRONGLY AGREE: 24 (62.5%)</td>
</tr>
<tr>
<td>ITEM NO.</td>
<td>STATEMENT</td>
<td>FREQUENCY/PERCENTAGE</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STRONGLY AGREE</td>
</tr>
<tr>
<td>6.</td>
<td>The 8-4-4 primary school curriculum contains more topics on environmental</td>
<td>15 (37.5%)</td>
</tr>
<tr>
<td></td>
<td>studies than the previous curriculum.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>The exam-oriented teaching in primary schools gives less emphasis to</td>
<td>7 (17.5%)</td>
</tr>
<tr>
<td></td>
<td>environmental studies.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Topics on environmental studies require more time than allocated in</td>
<td>24 (60%)</td>
</tr>
<tr>
<td></td>
<td>the time-table.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Environmental studies in the school curriculum are too detailed for</td>
<td>5 (12.5%)</td>
</tr>
<tr>
<td></td>
<td>primary school students.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>In-service courses on environmental studies for primary school teachers</td>
<td>27 (67.5%)</td>
</tr>
<tr>
<td></td>
<td>should be organized at divisional level.</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Centres for environmental studies responsible for organizing seminars</td>
<td>27 (67.5%)</td>
</tr>
<tr>
<td></td>
<td>and production of teaching resources should be established in every</td>
<td></td>
</tr>
<tr>
<td></td>
<td>division in the district.</td>
<td></td>
</tr>
</tbody>
</table>
From item 1 in table 3, it is clear that primary school teachers in Murang'a district are aware of the state of their environment. That is evidenced by the fact that all the selected teachers in the district agreed that, the environment was being spoiled by soil erosion, deforestation, pollution and other environmental problems. Moreover, 70.0% strongly agreed with the statement.

It was the opinion of all the selected teachers (with 65.0% strongly agreeing) that, all the citizens should be concerned about the environmental problems. That implied that, pupils in primary schools should be concerned and become aware of the state of the environment. The environmentally aware pupils are likely to develop positive attitudes towards the environment and participate in environmental conservation activities individually or as a group.

As a result of their environmental awareness, all the selected teachers in the district agreed with the statement that, 'Active participation in protection of the environment should be a duty of every citizen in Kenya'. As table 3 shows, 62.5% strongly agreed with the statement.

Of all the teachers who filled the questionnaires only one disagreed with the statement that education in primary schools should play a greater role in imparting environmental awareness in primary school pupils. The
affirmative responses to item 4 implied that teachers were aware of the role of education in social reconstruction.

Responses to item 5 (see table 3) indicate that teachers were of the opinion that although environmental studies have been part of the primary school curriculum most school leavers have continued to destroy the environmental quality as evidenced by deteriorating environment. New approaches and emphasis are required if pupils in primary schools are to develop environmental awareness, acquire skills and knowledge to enable them to stop destroying the environment and engage in environmental conservation activities.

Compared with the previous curriculum the new (8-4-4) primary school curriculum contains more environmental studies. That is inferred from the responses to item 6 where 92.5% of the selected teachers responded affirmatively. It would seem that those teachers who disagreed with the statement were not familiar with the topics in other disciplines other than the ones they were teaching. This may be due to the fact that teachers teaching different disciplines filled the same questionnaires.

In item 7, 52.% of the teachers agreed that, the examination oriented teaching in primary schools, gave less emphasis to environmental studies. As educational zones and districts in the country try to over-shine
each other in the final examination (K.C.P.E.), teachers spent most of their time drilling students with a view to make them pass the examinations.

Of all the teachers selected, 80.0% agreed that topics on environmental studies required more time than allocated in the time-table. One way of overcoming this problem would be for teachers to use other times either after classes in the evenings or on Saturdays to cover topics which required more time than allocated in the time-table.

The majority (70.0%) of the teachers disagreed with the statement that; 'Environmental studies in the primary school curriculum were too detailed for primary school pupils'. Probably the teachers who agreed with the statement (30.0%) were referring to the newly introduced topics such as pollution, ecological relationships, migrations in Kenya and others.

An overwhelming majority of teachers (95.0%) were of the opinion that, in-service courses on environmental studies should be organized at divisional level. That response compared favourably with response to item 11 where 95.0% of the teachers agreed that 'Centres for environmental studies should be established in every division in the district. The centres could offer the necessary follow-up to ensure that the teaching of environmental studies' programme was not rendered
ineffective by lack of resources and training. The centres could also provide demonstration sites and where possible, provide means of transport to primary schools needing such facilities for effective teaching of the programme.

The Teaching of The Environmental Studies in Primary Schools in Murang'a District

Part II of the questionnaire, assessed the teaching of the environmental studies and the problems teachers faced as they taught environmental studies. The items in Part II of the questionnaire required YES/NO responses, with some items requiring teachers to fill some more responses in the spaces provided. The items were analysed separately as Table 4 below shows:

Table 4
Teachers' Responses to The Teaching Part of the Questionnaire

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM STATEMENT</th>
<th>RESPONSE</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Have you been trained on how to teach environmental studies?</td>
<td>YES</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>27</td>
<td>67.5</td>
</tr>
<tr>
<td>2.</td>
<td>Have you attended any seminar or inservice course on environmental education?</td>
<td>YES</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>33</td>
<td>82.5</td>
</tr>
<tr>
<td>NO.</td>
<td>ITEM STATEMENT</td>
<td>RESPONSE</td>
<td>FREQUENCY</td>
<td>PERCENTAGE</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>3.</td>
<td>Do you involve students in your class in identifying and finding solutions to environmental problems in the school compound or surrounding area?</td>
<td>YES</td>
<td>37</td>
<td>92.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>4.</td>
<td>Do you conduct field trips such as visits to developmental project sites, exhibition and other environmental studies' supportive learning activities?</td>
<td>YES</td>
<td>25</td>
<td>62.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>5.</td>
<td>Have you involved students in your class(es) in environmental conservation activities like tree planting, soil conservation in the school compound or surrounding areas?</td>
<td>YES</td>
<td>35</td>
<td>87.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>7.</td>
<td>Do students use the same text book(s) as the teacher's reference book(s)</td>
<td>YES</td>
<td>30</td>
<td>75.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>10</td>
<td>25.0</td>
</tr>
<tr>
<td>8.</td>
<td>Do you get information on environmental issues from other sources apart from the reference books?</td>
<td>YES</td>
<td>32</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>9.</td>
<td>Do clubs such as wildlife, Young Farmers, 4-K, Scouts and Guides, which play an important role in imparting environmental awareness in students exist in your school?</td>
<td>YES</td>
<td>25</td>
<td>62.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>NO</td>
<td>ITEM STATEMENT</td>
<td>RESPONSE</td>
<td>FREQUENCY</td>
<td>PERCENTAGE</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>10</td>
<td>From your own observation are environmental studies adequately included in primary school curriculum</td>
<td>YES</td>
<td>26</td>
<td>65.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
<td>14</td>
<td>35.0</td>
</tr>
</tbody>
</table>

N.B [Item 6 was omitted deliberately to be analysed elsewhere since it required written responses]

Asked whether they were trained on how to teach environmental studies, the majority of teachers (67.5%) were found to have had no training. This cohort consisted of the untrained teachers and teachers who underwent training when there was no emphasis on environmental education. Item 2, asked teachers whether they had attended any seminar or in-service course. Out of forty teachers, 82.5% responded in the negative. The findings of item 1 and 2 indicated an urgent need to organize in-service courses and workshops, to ensure that all the teachers were adequately prepared to teach environmental education effectively.

Surprising responses were obtained in items 3 - 5. Although most teachers had no training on methods of teaching environmental studies, 92.5% of the selected teachers involved pupils in their classes, in identifying and finding solutions to environmental problems in their school compounds or surrounding areas. A large percentage of teachers (62.5%) conducted field trips to enhance the learning of environmental studies. Of the teachers who
filled the questionnaires, 87.5% involved pupils in their classes in environmental conservation and other activities in the school compounds and the surrounding areas. Considering that, a majority of the selected teachers had no training on how to teach environmental studies, the responses to items 3 - 5 came as a surprise but nevertheless encouraging since they indicated innovativeness on the part of the teachers.

An examination of the syllabuses indicated that the activities to be conducted by the teachers as they taught various disciplines were clearly stated. Such activities were, visiting an eroded area at different times of the year; planting trees and other outdoor activities. It is obvious that responses to items 3 - 5 were to a large extent as a result of teachers following the instructions given in the syllabuses. It was therefore concluded that, with well written textbooks and other resources even the untrained teachers would go far in propagating environmental awareness in their pupils and also assist them in developing positive attitudes towards the environment.

Item 4 (b) asked teachers who responded negatively to item 4 (a) to write down reasons why they were not conducting field trips as they taught environmental studies. The reasons given by these teachers were:

1. Field trips required longer time than allocated in the time-table, so it was not possible to conduct a field trip within that time.
2. Some field trips required means of transport to take the pupils away and the schools did not possess them. Moreover, most parents were poor and could not contribute money for hiring public vehicles to take pupils out.

3. Some teachers taught many streams and large classes, which made it difficult to organize field trips.

4. In some schools, poor communication due to impassable roads made it difficult to reach some projects.

5. Some school administrators were reluctant in arranging and financing field trips.

Field trips provide specific learning resources not readily available at the school. An intensive interaction between a pupil and the environment is required in order to make him remember and understand what is taught in the classrooms. To quote an old Chinese proverb:

"I hear and I forget
I see and I remember
I do and I understand".

(Troost and Altman, 1972)

Such proverb should be a motto in guiding environmental education curriculum implementers.
Item 6 asked teachers to give titles of the reference books they used as they planned lessons on environmental studies. The findings are contained in Table 5 below:

Table 5
Reference Books Used by Teachers in Teaching Environmental Studies

<table>
<thead>
<tr>
<th>CLASS</th>
<th>SUBJECT</th>
<th>BOOK TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Agriculture</td>
<td>Beginning Agriculture for Std 4.</td>
</tr>
<tr>
<td>5</td>
<td>Agriculture</td>
<td>Start Finding out for Standard 4</td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>Beginning Agriculture for Primary School.</td>
</tr>
</tbody>
</table>
|       | G.H.C. (Combined Course) | - G.H.C. (Combined Course) for Standard 5,  
|       |           | - Looking at Kenya and other lands,  
|       |           | - Kenya Primary School Geography. |
| 6     | Agriculture | - Primary Science and Agriculture for standard 6 and 7,  
|       |           | - Secondary School Agriculture  
|       |           | - Agriculture For Tropical Schools,  
|       |           | - Basic Agriculture. |
|       | Science   | - Primary Science and Agriculture for Standard 6 and 7,  
<p>|       |           | - Simple Science |</p>
<table>
<thead>
<tr>
<th>CLASS</th>
<th>SUBJECT</th>
<th>BOOK TITLE</th>
</tr>
</thead>
</table>
| 7     | Agriculture | - Primary Science and Agriculture for Standard 6 and 7  
|       |          | - Science and Agriculture for standard 7  
|       |          | - Learning Science and Agriculture for standard 7. |
|       | G.H.C. (Combined Course) | - Kenya Primary Geography,  
|       |          | - G.H.C. (Combined Course) for standard 7.  
|       |          | - The continent of Africa. |
|       | Science | - Learning Science for standard 7,  
|       |          | - Learning Science and Agriculture for Standard 7,  
|       |          | - Beginning Science,  
|       |          | - K.C.P.E. Encyclopaedia. |
|       | Agriculture | - Primary Agriculture for standard 8,  
|       |          | - Science and Agriculture for standard 8,  
|       |          | - Agriculture for Tropical Schools,  
|       |          | - Agriculture for School and Colleges,  
|       |          | - K.C.P.E. Encyclopaedia |
Table 5 above, gives a false impression that teachers in Murang'a had a wide choice of reference books to assist them in teaching environmental studies. The truth of the matter is that in some primary schools visited, some teachers were using college notes as reference books, because of lack of reference books. The researcher while analysing the data, found out that, in different schools teacher teaching the same subjects to the same levels used different reference books.

In some schools, teachers were using reference books which were relatively advanced for primary level. An example
is 'Secondary School Agriculture' a reference book which was being used by one teacher teaching agriculture in standard six. The teachers generally complained that, there was a shortage of reference books and that those few available ones were shallow. Some teachers mentioned the syllabus, as the reference book they used, since they did not have any other text book.

Surprisingly, no teacher mentioned any reference book written solely on Environmental education or Environmental studies. That implied that no text books written on Environmental Education were in use in primary schools. That signals an urgent need for the curriculum developers to produce relevant text books on environmental education to be used in primary schools. There is a need for uniformity in supplying reference books to primary schools to ensure that, teachers received similar reference books, and that they were not handicapped in teaching environmental studies by the lack of reference books.

Item 7 asked teachers whether pupils in their classes used the same text books as used by teachers as reference books. Most of the teachers (75.0%) responded positively. In cost-sharing, the Ministry of Education gave the parents the responsibility of buying their children the relevant text books in various subjects. Some able parents bought their children text books similar to
the ones the teachers were using as reference books. However, most of the pupils did not own text books. Table 6 below summarises the titles of pupils' text books in different classes and subjects.

Table 6
Titles of Text Books Used by Pupils in Learning Environmental Studies

<table>
<thead>
<tr>
<th>CLASS</th>
<th>SUBJECT</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Combined Course)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Start Finding Out.</td>
</tr>
<tr>
<td>5</td>
<td>Science</td>
<td>- Start Finding Out.</td>
</tr>
<tr>
<td>6</td>
<td>Agriculture and Science</td>
<td>- Learning Science and Agriculture for Standard 6 and 7.</td>
</tr>
<tr>
<td>7</td>
<td>Agriculture</td>
<td>- Agriculture for Primary Schools</td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>- Learning Science</td>
</tr>
<tr>
<td>8</td>
<td>Agriculture</td>
<td>- Beginning Agriculture</td>
</tr>
</tbody>
</table>

Table 6 above shows that few pupils' text books were mentioned by the teachers who filled the questionnaires. The researcher learned that it was not compulsory for the
pupils to buy text books on a given subject. Some pupils left their personal text books at home to avoid theft cases in the school.

The researcher wanted to know whether teachers in the district got information on environmental issues from other sources a part from the text books mentioned in Table 5. The study found that, 80.0% of the teachers got information on environmental issues from other sources. That response to item 8 compared well with responses to item 1 in Table 3 where 100.0% of teachers agreed that the environment was being spoiled by soil erosion, deforestation, pollution and other environmental problems. Asked to mention those sources the teachers gave the sources contained in Table 7.

Table 7
Teachers' Other Sources of Environmental Education
Information Other Than Reference Books

[N.B. The Percentages indicate the teachers using the mentioned source and should not be added]

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>NO. OF TEACHERS USING THE SOURCE</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pied Crow</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td>Newspapers</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>Rainbow</td>
<td>14</td>
<td>35.0</td>
</tr>
<tr>
<td>Agricultural Officers</td>
<td>8</td>
<td>20.0</td>
</tr>
</tbody>
</table>
Most teachers who filled the questionnaires got information about environmental issues from radio especially broadcast to schools. Indeed, other sources such as newspapers, magazines like Pied Crow, Rainbow played a major part in propagating environmental awareness among the teachers. These findings are significant to Environmental Education department of the National Environment and Human Settlement Secretariat as the department could utilize such channels to educate the public about the environment and the need to conserve the environment in its totality.

The researcher learned from the teachers that, schools received few copies of 'Pied Crow' and 'Rainbow' magazines and even some teachers were not aware of the existence of

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>NO. OF TEACHERS USING THE SOURCE</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio</td>
<td>17</td>
<td>42.5</td>
</tr>
<tr>
<td>Green Belt Promoters</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Guest Speakers</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Local Leaders</td>
<td>5</td>
<td>12.5</td>
</tr>
</tbody>
</table>
such magazines, in their schools. Since schools lacked teachers' reference books as well as pupils' text books, schools should be assisted in getting enough of the above mentioned magazines which are relatively cheaper than text books and contained up to-date information on the state of the environment.

Only one teacher out of forty teachers received information on environmental issues from a guest speaker. There was no doubt that, more guest speakers should visit schools with a view to addressing pupils and teachers about the environment and environmental conservation measures. That largely depend on the motivation of teachers and school administrators who should extend invitations to such speakers.

Asked whether clubs such as Wildlife, Young Farmers, 4-K, Scouts and Guides existed in their schools, 62.5% of the teachers responded affirmatively. The schools were analysed individually to find out which clubs existed and the findings are contained in the table below:

Table 8
Clubs existing in The Primary Schools Visited
[N.B. The percentages were calculated out of 10 schools visited and the percentages should not be added]
The study revealed that, Wildlife clubs did not exist in the primary schools visited. The researcher proposes that Wildlife clubs of Kenya officials should visit primary schools in Murang'a with a view to establish wildlife clubs in these schools in the district. The activities of the wildlife club would supplement what is taught in the classroom and also assist in developing environmental awareness in pupils.

The researcher learned from the teachers that some clubs were not active. In some schools, teachers were not aware that some clubs existed in their schools. The researcher tried to find out why some clubs were dormant in some schools and he got the following reasons:

1. Teachers were over-loaded with lessons and all the school time was used either marking pupils' books or planning for the next day's lessons and had no time for club activities.
2. Clubs met after classes when teachers and pupils were planning to go home.
3. Teachers were not conversant with the activities of the clubs consequently they failed to motivate the pupils.

The researcher was of the opinion that some teachers indicated the existence of clubs in their schools even if
such clubs did not exist because they feared that the D.E.O. would find out.

Item 10 asked teachers whether environmental studies were adequately incorporated into the primary school curriculum. Most of the teachers (60.0%) responded affirmatively. The teachers who were dissatisfied with the environmental studies already included in the primary school curriculum gave the following as the topics they wanted included:

1. Land and air pollution
2. Afforestation
3. Problems caused by large population and family planning.
4. Disposal of effluence from coffee factories.
5. Location of pit latrines and their hygiene
7. Pollution of the environment.

For the study, the researcher dealt with a cross-section of teachers teaching either Agriculture, Science, G.H.C. (Geography, History and Civics), Home Science or Arts and Crafts. Some of the topics, the teachers wanted included in the curriculum appear in Table 2 meaning they existed in the syllabuses, but some teachers did not know. The multi-disciplinary approach used in teaching environmental studies in the primary schools, made teachers not to know the topics on environmental studies, included in
the disciplines they were not teaching.

This study, also assessed the problems faced by primary school teachers in Murang'a district while teaching environmental studies.

Problems Faced by Primary School Teachers in Murang'a District While Teaching Environmental Studies

The study found the teachers faced many problems and the researcher classified them as economic, social and others.

A. Economic Problems
1. Lack of finance needed in organizing field trips far from the school.
2. Lack of relevant reference books and other teaching aids.
3. Lack of learning resources such as pupils' text books.
4. Lack of tools to be used in conservation activities.

B. Social Problems
1. Students not motivated enough, especially when asked to soil their hands during conservation activities like planting trees, cutting terraces and other practical activities.
2. Lack of enough ground in the school compound where practicals could be conducted.
3. lack of well informed personnel in the school vicinity who could be invited as guest speakers.

4. Pupils grew in a spoiled environment therefore they lacked comparison.

5. Pupils concentrated more on examination and were not interested in conservation activities.

6. Teachers who were not trained to teach environmental studies felt incompetent.

C. Other Problems

1. Time to cover environmental studies was not sufficient.

2. Teachers were using shallow reference books.

3. Some schools lacked piped water to water the seedlings in the dry season and so discouraged afforestation activities.

4. Primary schools were over-crowded making soil conservation activities in the school compounds ineffective.

With the above problems facing them, item 12 asked teachers the recommendations they would like to suggest with reference to maintaining environmental quality through environmental studies.

Teachers' Recommendations on How to Maintain Environmental Quality Through Environmental Studies.

1. Inservice courses, seminars and workshops for primary school teachers, should be organized in all
divisions in the district.

2. The Ministry of Education through the school equipment department, should supply relevant books for teachers and course books for pupils.

3. The syllabuses should give more time to environmental studies.

4. Schools should be provided with enough magazines such as Rainbow and Pied Crow.

5. Ecological gardens should be set up in primary schools where pupils can show examples to the community in the vicinity by planting trees and conserving soil.

6. The Ministry of Education should assist schools in organizing field trips.

7. Environmental studies Centres should be introduced in the district.

8. Environmental studies should appear in the newspapers at least twice a week.

9. Schools should be supplied with implements to be used by the pupils in conservation activities.

10. Environmental education should be time-tabled as a separate subject where interdisciplinary approach is used.

11. Non-Governmental Organizations such as Wildlife Clubs of Kenya should organize film shows in the primary schools.

12. Local people should be taught the importance of conservation of the environment to help pupils realize the practicability of environmental education.
outside the school.

13. The Ministry of Environment and Natural Resources should with consultation with the inspectorate ensure that school compounds are ecologically maintained.

Summary

The chapter provided the analysis and interpretation of the data collected in the study. The incorporation and the teaching of environmental studies in primary schools in Murang'a district was assessed. The multi-disciplinary approach to teaching of environmental studies was found to be in use in primary schools. The disciplines mostly involved in teaching the environmental studies in upper primary schools are Combined course, Science, Agriculture, Home Science and Arts and Crafts.

Responses to items in Part 1 of the questionnaires indicated that teachers in the district possessed positive attitude towards the environment and environmental studies. The teachers endorsed the statement that, 'Education in primary schools should play a great role in imparting environmental awareness to the primary school pupils.

Most of the primary school teachers in Murang'a district had no training on methods for teaching environmental studies, more over, they had not attended any seminar or workshop on environmental education.
A large percentage of teachers conducted field studies involved pupils in identifying and solving environmental problems and in environmental conservation.

Teachers in the district used different reference books in teaching the same subjects to the same classes in different schools. Teachers complained of shortage of reference books.

Most primary schools had clubs such as Young Farmers 4-K, Scouts and Guides, however in some schools the clubs were not active. Most teachers got information related to the environment from sources such as Pied Crow and Rainbow magazines, Newspapers, Radio and other sources. Teachers faced economic, social and other problems as they taught environmental studies. To improve the environmental quality through environmental studies, the teachers gave various recommendations.
CHAPTER 5

SUMMARY, RECOMMENDATIONS AND CONCLUSION

Introduction

This chapter presents a summary of the study's findings and conclusions derived from those findings. On the basis of the findings and conclusions recommendations and suggestions for further research are given.

Summary

Environmental education has received much emphasis in the recent times than any other time in history. Environmental education is expected to provide a long-lasting solution to the existing and future environmental problems through changing people's attitudes and values to be in line with sound environmental management. To attain that goal, environmental education has been incorporated into the existing curricula in Kenya. To date, no research has been done to assess the extent to which environmental education has been incorporated in Kenya's primary school curriculum. The researcher therefore aimed at assessing the incorporation and the teaching of environmental studies in primary schools in Murang'a district.

The following questions guided the research:

(i) To what extent are the environmental studies incorporated into the primary school education curriculum?

(ii) What are the attitudes of primary school
teachers in Murang'a district towards the environment and environmental studies?

(iii) What resources do primary school teachers in the district use in teaching environmental studies?

(iv) What problems do the teachers in the district face while teaching environmental studies?

The study used a questionnaire divided into two parts. Part I assessed the attitudes of teachers towards the environment and environmental studies. Part II assessed the teaching of environmental studies in Murang'a district. The upper primary school syllabuses were also examined to identify the approach used in teaching environmental studies and the extent to which environmental studies are incorporated into the primary school curriculum.

Summary of the Findings

The examination of the syllabuses revealed that a multi-disciplinary approach to teaching environmental studies is used. The studies are incorporated into the existing disciplines. The incorporated studies are mainly in Agriculture, Combined Course (Geography, History and Civics), Science and Home Sciences syllabuses. Some topics on environmental education were found to be incorporated in more than one discipline.
Teachers in Murang'a district primary schools were found to have positive attitudes towards the environment and environmental studies. The teachers were aware of the state of the environment in the district. They accepted the fact that, concern for the environment and especially active participation in solving the existing and future environmental problems should be a duty for every citizen, implying their pupils also.

The teachers agreed that: (1) education should play a vital role of imparting environmental awareness in the pupils, and (2) education should assist pupils in clarifying and developing values and attitudes, acquire knowledge and skills to enable them to conserve their environments.

The study showed that, most teachers in the district had no formal training on how to incorporate environmental education into the instructional programmes of other disciplines. Moreover, few teachers had attended or participated in any seminar or in-service course(s) on environmental education.

In spite of lack of training, most of the teachers who filled the questionnaires were active in organizing out-door activities and involving pupils in identifying and solving environmental problems in their school compounds and surrounding areas. The teachers engaged
the pupils in such activities as afforestation, soil conservation and other related activities. The few teachers who did not organize field trips and other out-door activities gave excuses such as lack of time, lack of transportation, large classes to organize trips for, poor communication to and from schools and unco-operative administrators.

In many schools visited in this study, teachers had a shortage of reference books. A majority of the teachers complained that the few available reference books were shallow and did not provide the teachers with all the information on environmental studies as the syllabuses required. The shortage of reference books was so acute in some schools that some teachers used advanced textbooks meant for colleges and secondary school students.

Many teachers, mentioned newspapers, radio, magazines ('Pied Crow' and 'Rainbow'), agricultural extension officers, guest speakers and local leaders as the other sources of information on environmental issues. However, these teachers complained of inadequate magazines saying that, few copies reached the schools making it impossible for all teachers to have an access to these magazines. The researcher noted with concern that no text book on environmental studies was in use in any of the schools visited.
It was found that, most of the primary schools visited, had clubs such as Young Farmers, 4-K (i.e. Kuungana, Kufanya, Kusaidia, Kenya) Scouts and Girl Guides. Most of the clubs, as testified by some teachers, were inactive. The teachers who were supposed to motivate the club members, complained of much school work, bad scheduling of club members' meeting time, and lack of familiarity with the activities of the clubs they were patronising.

Most teachers were satisfied with environmental studies already included in the syllabuses. The few teachers who had different opinions quoted the topics they thought were worthy including in the syllabuses. These topics ranged from afforestation, pollution, siting of pit latrines and environmental conservation. Surprisingly, most of these topics were already included in some syllabuses other than the ones these teachers were familiar with.

The teachers had various recommendations they thought necessary in order to improve environmental quality through environmental studies. These recommendations were mainly on improvement of teaching of environmental studies. The teachers recommended the organization of in-service courses, seminars and workshops for primary teachers at either district or divisional levels. The in-service courses, seminars and workshops should be used as a forum to impart environmental awareness to teachers and a training ground for the teachers to learn how to inco-operate environmental education into their respective instructional programmes.
Discussion

The results of this study indicate that environmental problems exist in Murang'a district even though the incorporation of the education needed to alleviate such problems is already done. There is a need to alter man's attitudes and values which determine his behaviour if the problems are to be solved. As the environmental education per se, cannot solve these problems, the education should be directed towards acquisition of environmentally sound beliefs, attitudes and values which are expected to direct man's behaviour and cause him to appreciate and respect the environment.

An uninformed citizenry can never be concerned or committed to the improvement of the environmental quality anywhere. Environmental education should therefore impart environmental awareness in the pupils and make them have a reverence for all life, respect the existence of all the environment (man-made and natural) and accord the highest priority to environmental quality.

Primary school pupils, are at the stage at which attitudes, values and skills necessary in making reasonable decisions are acquired. It is at this critical stage then, that the pupils should be assisted in developing and clarifying values, beliefs and attitudes that are compatible with the environmental quality. The incorporation of the environmental studies and ecological
courses into the primary school curriculum may significantly change the beliefs, attitudes, values and behaviour of the pupils and make them have a respect for the environment and devote themselves to protecting it.

Murang'a district requires people who are out to defend the environment when decisions likely to destroy the quality of the environment are made by the policy makers. The recent out-cry from the environmentalists and the general public when Mama Ngina Drive in Mombasa, which is used for recreation and Impala Park in Kisumu, were to be utilized by private entrepreneurs, indicate that environmental education in Kenya is developing roots. As a result of these out-cries both of the above environments were saved from destruction. People in the district should then guard the environment and much more participate in solving the current and future environmental problems.

For the environmental education to achieve the expected goals, the teachers must be trained to teach it, using inquiry approach. Pupils must learn 'in' the environment, about 'the' environment and 'for' the environment. Environmental education's learning process requires first hand experiences, focusing on total environment in the school compound and surrounding areas. Learning is a process of emergence from within an individual and no wonder it is said that, personal experience is
the best teacher. Environmental education should then involve pupils in personal experiences of the environment by providing for direct exploration of the environment.

To support the environmental studies programme, there is an urgent need to implement what is stated in 1979-1983 Development Plan that: 'Inservice programmes seminars and workshops for teachers and other professionals would be organized, where the need to take account of environmental considerations in their work is emphasized.' Another aspect of the Development plan which requires implementation is a National Centre on Environmental Research, expected to co-operate with National curriculum agencies and informal channels of information. The Centre, is expected to formulate environmental education programmes, provisions of facilities for effective evaluation, dissemination and preparation of educational resources and instructional materials and training of personnel for roles in environmental education.

Environmental education in primary schools, is facing problems as a result of lack of teachers who can effectively integrate environmental education into their instructional programmes, lack of reference books and pupils text books and other financial problems. Teaching a new subject or topic, a teacher is expected to face such problems. However, there is no alternative, environmental education must be taught if man is to survive beyond the year 2000. This is not a time to bury
our heads into the sand, it is a time to act. The writing is on the wall, as environmental quality disappears we disappear also.

Recommendations

In order to improve the teaching of environmental education in Murang'a district, with a view to solving the existing and future environmental problems, the following are the recommendations:

1. The environmental education panel at the K.I.E. should be revived and be given the role of co-ordinating the incorporation of environmental studies into the existing disciplines. The panel should be involved in pre-service and in-service teacher training, organizing seminars production of teaching supportive services, provision of leadership and assistance where necessary.

2. Primary schools in Murang'a and other districts, should be provided with sufficient copies of 'Rainbow' and 'Pied Crow'. Sufficient copies, to ensure that every teacher in a school gets his or her copy and if possible some for the library to be read by the pupils. should be supplied to schools.
3. An environmental studies Centre should be established in the district. The Centre should work in co-operation with the curriculum developers, informal channels of information such as environmental research institutions, Non-Governmental Organizations dealing with the environmental issues such as Environmental Liaison Centre, Green Belt Movement and other government organizations such as, Permanent Presidential Commission on Soil Conservation and Afforestation, National Environment and Human Settlement Secretariat, and Kenya Missions to UNEP and Habitat.

4. Teachers should frequently organize field trips, excursions and other practical work outside the classrooms. The out-door activities give pupils an opportunity to acquire direct experience of the environment and environmental problems.

5. Primary schools should set aside, ecological gardens where environmental demonstrations could be displayed for the benefit of pupils and the surrounding community.
6. In-service training, seminars and workshops on Environmental education for primary school teachers should be organized frequently at the divisional level to enable teachers to integrate environmental education into their instructional programmes and to use problem solving approach in teaching environmental studies.

7. The school pupils, together with the surrounding community, should ensure that the soil in the school compound is conserved. Most schools visited were heavily eroded as a result of overcrowding in the schools and extended buildings which collect much water forming run-off and carrying much soil from the school compounds.

8. Wildlife clubs should be established in all primary schools in the district. The Wildlife Clubs of Kenya officials should be visiting schools and giving lectures on conservation and showing films related to environmental conservation activities. The Wildlife Clubs of Kenya (WCK) should, through financial aid from the Government, supply to the primary schools the 'Komba' and 'Conservation Bulletin' magazines which can supplement the teaching of the environmental studies by imparting environmental awareness.
Suggested Areas for Future Research

For effective implementation of environmental education, research is required. This researcher suggests the following areas for future research:

1. A research should be carried out to assess the application of environmental education by the primary school graduates in environmental management after leaving school.

2. A study should be carried out to investigate whether environmental education is taught in Village Polytechniques which absorb most of primary school leavers who fail to proceed to high schools.

3. A research should be carried out to investigate the differences in efficiency between teachers who have been trained to incorporate environmental education into their disciplines and those who are not trained.

4. A research on the influence of environmental education on environmental management in Murang'a district should be done.

5. The attitudes of pupils towards the environment should be investigated.

6. There is need to investigate the differences between the traditional lecture method and the inquiry approach in changing attitudes and
values in primary school pupils towards the environment.

7. An investigation should be done to assess how much the primary school teachers use the environment as a teaching resource.

Conclusion

In this project the incorporation and the teaching of the environmental studies in primary school was assessed. Forty teachers, selected through stratified random selection filled the questionnaires. The researcher also examined the upper primary syllabuses to investigate how much environmental studies were incorporated into the primary school curriculum.

Modified Lickert Scales were used in assessing the attitudes of primary school teachers towards the environment and environmental education. The data were analysed, expressed as frequencies and later into percentages.

The research revealed that a Multi-disciplinary approach is used to teach environmental studies in primary schools. The disciplines which mostly contain Environmental studies are Agriculture, Combined Course, Science and Home Science. Teachers in Murang'a District were found to have positive attitudes towards the environment and environmental studies. The selected teachers agreed that environmental education should play
a vital role in propagating environmental awareness to pupils and equip them with knowledge and skills to solve environmental problems. Environmental education should aim at changing pupils' attitudes, beliefs, and values in order to make them sensitive to an environment under destruction and to make them participate in environmental conservation activities.

A Majority of the teachers selected were found to have had no training on how to incorporate Environmental education into their instructional programmes. However, most teachers frequently used the environment as teaching resource. That was evidenced by the fact that 62.5% of the teachers conducted out door activities as they taught environmental studies. That finding was quite encouraging because through such first hand experiences pupils would understand environmental education and respect the environment.

The study revealed that clubs such as scouts and Guides, 4-k, Current Affairs, and Young farmers existed in some primary schools visited. In some schools, these clubs were not active and there is a need to revitalise them so that through these clubs the pupils can acquire environmental awareness which is essential in environmental management. The study revealed that teachers faced various problems such as lack of reference books, means of transportation to the pupils
for field trips far from schools and other economic and social problems. There is a need to intensify the teaching of environmental education in Murang'a district with a view to producing primary school leavers who are aware of the state of the environment in the district and who are motivated enough to halt the existing environmental problems in the district through active participation in conserving the environment.
REFERENCES


Appendix A

LOCATION MAP

FOREST (Zone 1)
Wooded and Brushed Grassland (Zone 2)
Wooded Grassland (Zone 3)
Woodland mixed with Dwarf Shrub Grassland (Zone 4)

TO WHOM IT MAY CONCERN

RE: M.ED. (T.D.C.) RESEARCH PROJECT.

Please kindly assist Mr/Mrs/Miss DANIEL GATHURU MANGURIU
I.D. NO. 5212224/68
to obtain necessary information for the above named project
in your school/institution.

The researcher has already applied for an official
research permit which will be made available to you as soon
as it is cleared through appropriate bureaucratic procedures.

The topic under investigation is AN ASSESSMENT OF THE
INCORPORATION AND THE TEACHING OF THE ENVIRONMENTAL
STUDIES IN PRIMARY SCHOOLS IN MURANGA DISTRICT.

Thank you very kindly for your willing cooperation.

DR. PAMELA E. WANGA,
COORDINATOR,
M.ED. (T.D.C.) PROGRAMME.

PEW/ea.
Dear sir,

REF: EDUCATION RESEARCH QUESTIONNAIRE

I am carrying out an education research on Primary Schools in Murang'a District and your School is one of them. The aim of the research is to assess the incorporation and teaching of environmental studies in primary schools in Murang'a District. On completion of the project recommendations for future improvement will be given. All the data collected will be used strictly for statistical purposes and are confidential. You are required to answer questions in both questionnaires contained here, correctly and honestly.

For the purpose of this research environmental studies are such issues as soil erosion, deforestation, population explosion and its consequences, air, land and water pollution, problems of solid waste in towns and others.

1. Active participation in
   The Parent should be a duty of

Name of the Primary School..............................................

The classes you teach environmental studies........................

..........................................................
ENVIRONMENTAL ATTITUDE QUESTIONNAIRE

Put a tick into the appropriate parentheses to the right to indicate whether you: strongly agree, agree, disagree or strongly disagree with the statements to the left.

<table>
<thead>
<tr>
<th></th>
<th>strongly agree</th>
<th>agree</th>
<th>disagree</th>
<th>strongly disagree</th>
</tr>
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<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

1. Our environment is being spoiled by soil erosion, deforestation, pollution and other environmental problems. 

2. All citizens should be concerned about those environmental problems. 

3. Active participation in protection of environment should be a duty of every citizen in Kenya. 

4. Education in primary schools should play a great role in imparting environmental awareness to the primary pupils. 

5. Though environmental studies have been part of the primary school curriculum, most primary school leavers have continued to destroy environmental quality.
6. The 8-4-4 primary school curriculum contains more topics on environmental studies than the previous curriculum.  (  )  (  )  (  )  (  )

7. The exam-oriented teaching in primary schools give less emphasis to environmental studies.  (  )  (  )  (  )  (  )

8. Topics on environmental studies require more time than allocated in the time table.  (  )  (  )  (  )  (  )

9. Environmental studies in the primary schools curriculum are too detailed for primary school students.  (  )  (  )  (  )  (  )

10. Primary school teachers' in-service courses on environmental studies should be organised at divisional level.  (  )  (  )  (  )  (  )

11. Centres for environmental studies responsible for organising seminars, teaching resources production should be established in every division in the district.  (  )  (  )  (  )  (  )
ENVIRONMENTAL STUDIES TEACHING QUESTIONNAIRE

1. Have you been trained on how to teach environmental studies? Yes ❑ No ❑

2. Have you attended any seminar or inservice course on environmental education? Yes ❑ No ❑

3. Do your involve students in your class in identifying and finding solutions to environmental problems in the school compound or surrounding area? Yes ❑ No ❑

4. (a) Do you conduct field trips such as visits to developmental project sited, exhibition and other environmental studies supportive learning activities? Yes ❑ No ❑

(b) If No Please explain Why.................................................................
..........................................................................................................
..........................................................................................................
..........................................................................................................
..........................................................................................................
..........................................................................................................
..........................................................................................................
..........................................................................................................

5. Have you involved students in your class(es) in environmental conservation activities like tree planting, soil conservation in the school compound or surrounding areas? Yes ❑ No ❑

6. In teaching environmental studies, which reference book(s) do you use?
1. ..........................................................................................................
2. .............................................................................................................
3. ..........................................................................................................................

7. (a) Do students use the same textbook(s)?
(b) If No please give the title(s) of the book(s) the students use in learning environmental studies:
1. ..........................................................................................................................
2. ..........................................................................................................................
3. ..........................................................................................................................

8. (a) Do you get information on environmental issues from other sources apart from the textbook(s) mentioned above?
(b) If YES name those sources
1. ..........................................................................................................................
2. ..........................................................................................................................
3. ..........................................................................................................................

9. (a) Do clubs such a Wildlife, Young Farmers, 4-K, Scouts and Guides which play important role in imparting environmental awareness in students exist in your school?
(b) If Yes please name the existing clubs:
1. ..........................................................................................................................
2. ..........................................................................................................................
3. ..........................................................................................................................
10. From your own observation, do you think:
   (a) environmental studies are adequately included in primary school curriculum? Yes ☐ No ☐
   (b) If No, give some of the topic(s) you would like to be included in the curriculum.
      1. ................................................
      2. ................................................
      3. ................................................

11. Mention some of the problems you face while teaching environmental studies:
   (a) ................................................
   (b) ................................................
   (c) ................................................
   (d) ................................................
   (e) ................................................

12. Write down some of the recommendations you would like to suggest in reference to maintaining environmental quality through environmental studies:
   (a) ................................................ ................................................
   (b) ................................................ ................................................
   (c) ................................................ ................................................
   (d) ................................................ ................................................

THANK YOU FOR YOUR CO-OPERATION