A SURVEY OF RESOURCES FOR TEACHING AND LEARNING
ENVIRONMENTAL EDUCATION IN PRIMARY
TEACHERS COLLEGES IN KENYA

A PROJECT SUBMITTED IN PARTIAL FULFILMENT FOR
THE DEGREE OF MASTER OF EDUCATION (PRIMARY
TEACHER EDUCATION), M.ED. (PTE), OF
KENYATTA UNIVERSITY

BY

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A Survey of resources
for teaching and
DECLARATION

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

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To my dear friend and husband, David Ndolo, and our children, Wambua, Nthambi, Kioko, Ndunge and Mutindi.
ACKNOWLEDGEMENT

The cooperation and goodwill of many friends have helped to make this work a success and I am grateful to them all.

In particular, I would like to give very special thanks to my supervisor, Dr. Michael Korir-Koec for the thorough and prompt professional support and guidance given at all the stages of this investigation.

I am also indebted to Professor Patel for the helpful suggestions on the design of the study and Mr. Kerich for proof-reading the final draft of the project.

To Mrs. Munene of K.I.E. for tirelessly making available to me the K.I.E. prepared teaching/learning materials for Primary Teachers Colleges and Primary Schools.

To all the tutors of G.H.C, Science, Agriculture and Home Science at Thogoto, Kilimambogo, Machakos and Highridge Teachers Colleges, for very kindly completing my questionnaire and the check-list.

To Mr. James Mbandi for helping with the materials necessary for the production of this work.

To Mrs. Grace Wambui Muchiri for very efficiently typing the work and finally to my husband David Ndolo for the immense support he gave throughout my M.Ed. Course.

May God bless all of them.
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Environmental Education (EE), has been a subject of great importance the world over, in the last two decades. This has been necessitated by the fact that environmental problems created by man, especially during this technological era, are seriously threatening the very survival of man himself. It was the awareness of the seriousness of environmental degradation rampant throughout the world that led to the formation, in 1972, of the United Nations Environment Programme (UNEP). Soon after the launching of UNEP, the UNEP Governing Council realised through its deliberations that education on the environment would be an effective means of combating Environmental problems. This realization culminated into the formation of the International Environmental Education Programme (IEEP) in 1975, by UNESCO in collaboration with UNEP.

It is the desire of the IEEP that all the nations of the world incorporate EE in their education systems, using either the inter-disciplinary or the multi-disciplinary approaches.
Kenya decided to incorporate EE in her education curriculum during the implementation of her newly adopted 8-4-4 system of education.

This study was an exploratory survey whose purpose was to find out whether EE has been properly implemented in Primary Teachers Colleges in Kenya or not. In particular, the researcher wanted to find out:

a) whether teaching/learning resources for EE are available in the Primary Teachers Colleges,

b) where such resources were obtained from,

c) whether the tutors of EE had been academically and professionally prepared to teach the subject,

d) whether students were exposed to the environmental problems that face Kenya in particular, through the use of field trips or studies,

e) how the resources were stored and finally,

f) whether the tutors of EE were afforded a forum for sharing ideas on production and use of EE materials.
Design:

Two instruments were employed to gather the data. These were: a questionnaire and a check-list appearing as appendixes A and B respectively.

A total of 32 respondents were sampled from among the GHC, Science, Agriculture and Home Science tutors from the 4 Primary Teachers Colleges used for the study, namely: Highridge, Thogoto, Machakos and Kilimambogo.

After the questionnaire and the check-lists were completed, the researcher analysed the data in Chapter Four of this project. The data analysis revealed that there are no adequate resources for teaching EE in the 4 Colleges from which the sample was drawn; that most of the tutors were not even aware of what EE was all about. Consequently, field studies were not being effectively used and hence it could be concluded that EE has not properly taken off in Primary Teachers Colleges in Kenya, since this study can be generalised to the other thirteen Teachers Colleges which were not covered.
CHAPTER 1

1.0 BACKGROUND TO THE PROBLEM

1.1 The Global Development of Environmental Education (EE)

Environmental Education (EE) is, relatively, a new term whose origin can be traced back to the early 1970s. Environmental Education was conceptualised after the realisation that the rapid growth of human population with its attendant needs, and the scientific and technological advancements which enabled man to exploit the environment more intensively, were accelerating the pace of environmental degradation so fast that there was a danger of ruining the environment and hence rendering it incapable of supporting human life, if the degradation was not checked.

Wheeler, (1975) in his paper, "The Genesis of Environmental Concept" wrote,

man cannot be separated from his environment: not only the environment of his natural world but also the environment of his cultural background. 1

Man therefore constantly interacts with his environment.
It is his natural environment that nurtures him, and his cultural environment that dictates to him the kind of choices he must make, and the actions he must take when confronted with different environmental problems. Example, the different types of pollution brought about by technological developments, desertification, resource mismanagement, unplanned rural and urban settlements etc.

Trends in environmental degradation, in the 1950s and 1960s, led concerned observers to pronounce the need for action to be taken to protect the human environment. It was that need that led to the formation of the "United Nations Environment Programme", (UNEP), in 1972.

Twenty years prior to the 1972 Stockholm Conference, potential perils on human race had been discussed in various United Nations Organisation (UNO) conferences. During late 1960s, problems of human environment were specifically identified and discussed thoroughly by United Nations Organisation and its agencies.

The 1972 Stockholm Conference "was convened to bring to the attention of governments and people of"
the world evidence that man's activities were damaging the natural environment, and were giving rise to serious risks for the survival and well being of man himself".2 "To defend and improve the environment for the present and future generations has become an imperative goal for mankind",3 declared the Stockholm Conference.

Problems of pollution, resource depletion, hunger, malnutrition, disease and illiteracy were incorporated in the UNEP programme. The Stockholm Conference developed an action plan that consisted of 109 recommendations, calling on governments, UN agencies and international organisations, government and non-governmental, to co-operate in taking specific measures to deal with the wide variety of environmental problems. A UNEP Governing Council was then convened to steer the activities aimed at minimising environmental degradation. The first UNEP Governing Council meeting took place in Geneva in 1973, and the first policy objective was:

To provide through inter-disciplinary study of natural and man-made ecological systems, improved knowledge for an integrated and rational management of the resources of the biosphere, and for safe-guarding human well-being as well as the ecosystems.4
So, it is clear that formal education was immediately seen by the United Nations Organisation and its agencies, and many world governments as playing a significant role in disseminating knowledge on environmental awareness.

The second session of UNEP Governing Council took place in Nairobi–UNEP Headquarters – in 1974. In 1975, UNESCO, in collaboration with UNEP launched the International Environmental Education Programme, (IEEP). In 1975 also, a survey of International Environmental Education needs and priorities, in which 80% of its member states took part, was conducted. Within the same year, 1975, and with the same view, UNESCO organised an international workshop on Environmental Education in Belgrade. At the same time, regional and sub-regional meetings on EE were held in Africa, the Arab States, Asia, Europe and Latin America. Environmental Education has therefore, been a subject of global concern. Experimental EE studies have been undertaken in all the regions of the world and an international network of information on EE set up. The launching of the International Environmental Education Programme in 1975 aimed at promoting exchange of information and experiences, research and
experimentation, training of personnel, curriculum and curriculum material development, and international co-operation in the field of EE.

The Belgrade Charter proposed several guiding principles to EE programmes and stressed that EE should have the following characteristics:

- be a continuous life long process.
- be inter-disciplinary in approach.
- consider the environment in its totality.
- emphasise active participation in preventing and solving environmental problems.
- examine major environmental issues from a global point of view, giving due importance to regional differences, and,
- promote the value of local, national and international co-operation in the solution of environmental problems.

The Tbilisi Conference held from 14th to 26th October, 1977, was the first Inter-governmental Conference on EE organised by UNESCO/UNEP. Indeed, it was the culmination of the first phase of the IEEP, launched by UNESCO in 1975. "...the Tbilisi Conference was the starting point for an international environmental
education programme consistent with the wishes of the member states". The Conference helped specify the actual nature of EE by laying down its aims, characteristics and strategies to be adapted at international level.

It considered that EE as an essential component in comprehensive and lifelong education with a problem solving approach and providing for active involvement by the public, should help to make education systems relevant and more realistic, and to establish greater inter-dependence between these systems and their natural and social environment, with a view to increased well-being in human communities.

In his opening address to the Conference, the Director General pointed out that:

EE should, in respect of ethical and aesthetic values as in respect of economic considerations, promote attitudes which will encourage individuals to discipline themselves first of all in order not to impair the quality of the environment but also in order to play a positive role in collective action to improve it.

The Tbilisi Conference envisaged EE not as an extra subject to be tucked on to the existing curriculum
but rather one that demanded an inter-disciplinary approach; that is, incorporation within the traditional disciplines which play an essential part in understanding the complex problems of the environment and devising solutions for them. Therefore, EE is an all encompassing field of study, an aspect which helps portray the magnitude of its importance. Environmental concerns must therefore be seen as an ever present dimension and function of education in a broad sense.

Although environmental problems are global, they take on different and peculiar characteristics in different regions of the world, individual countries and even within different regions in a country. For example, whereas most developed countries have to wrestle with the problem of different kinds of pollution as a consequence of their higher technological developments, the developing countries have to contend with the problems of hunger and malnutrition, disease, unemployment and illiteracy.

The major purpose of the Tbilisi Conference was to formulate recommendations for actions which might be undertaken at the national, regional and international levels for the promotion and development of
EE. The specific activities that are carried out under the principle domains of action of EE programme as proposed by the Tbilisi Conference include:

1. Collection, systematization and circulation of information. To help disseminate the information, an international network of EE communication system was established. Its first instrument was the publication of the newsletter "CONNECT", which is published three times a year and circulated to all UNESCO member states and to any other institutions or individuals who show interest through subscription. Each issue of CONNECT is dedicated to a principal theme.

2. An international survey under EE, Needs and Priorities is undertaken. It surveys environmental activities, collects, systematises and circulates information. In addition, it reports, and disseminates to all member states, resolutions reached by meetings of experts both at regional and international levels. Pilot projects are also identified and financial assistance given to facilitate the undertakings. These are normally carried out in preparation for future inter-governmental conferences in which the studies are reported.
Although the above undertakings by the International Environmental Education Programme (IEEP) are indicative of an attempt to solve environmental problems through EE, it should be noted that it would be unrealistic to claim that EE can solve all the environmental problems. The reason is that, environmental problems have different causes; economic, social, cultural, physical, biological and ecological. However, EE can play a facilitating role to the solutions by helping create an awareness and greater sensitivity to the problems. As Mustafa Tolba, the Director of UNEP once stated:

Ignorance is one of the most important causes of environmental 'impoverishment. With an adequate system of information, we can learn not to repeat the mistakes of others but also to benefit from others achievements.9

Rajabu, in his article, "Experiences in the Field of EE and Training", appears to deem EE as the panacea to environmental problems. He wrote the following in the above connection:

It is generally accepted that education is a sine qua non of social and economic developments...education also brings about change of attitude towards issues of personal survival. The "modernity
syndrome" which comprises attitudes such as adaptability high level of awareness, or receptability to new ideas, and which is directly associated with education, is a prerequisite to change... Additionally, research evidence indicates that the effect of education and development is greater than the sum total of these attributes. Taking these attributes in mind, it is very clear that environmental conservation and protection can be achieved through environmental education.10

1.2 DEVELOPMENT OF EE IN KENYA

The awareness of environmental problems has a long history in Kenya.

Even before independence, though with little conscious impulse, environmental aspects were embodied within the agriculture, geography, nature study and hygiene.11

According to the Ministry of Environment and Natural Resources Report (1981), Curriculum for primary school is influenced by the African Primary Science Programme (APSP) started in 1965, and the Science Programme for Africa established in 1971 to further Environmental Science Programme, which had been begun by the African Primary Science Programme (APSP) and the Kenya Primary Science Programme (KPSP)
begun in 1974 by the Kenya Institute of Education (KIE) to supplement the work of Science Education Programme for Africa (SEPF).

The report goes on to say that one of the aims of the programmes was to help children understand how the environment functions. It can therefore be argued from the above examples that there has been some attempt to inco-operate environmental studies in Kenya's school curriculum since the early 1960s, and perhaps even since late 1950s, albeit without a clear policy.

Environmental awareness has been for a long time, inculcated in the minds of Kenyans through informal education systems. This has been evidenced by Development Plan statements which clearly indicate that, real development depends on the proper utilization and preservation of Kenya's natural endowments (resources) which constitute the physical environment.

Writing about Environment and Development, the National Environment Secretariat report (1978) reiterated,
...but perhaps the most profound change in Kenya as well as in most other parts of the world, has been belated recognition that yet another dimension must be added to the development process. This, of course, is the quality of the human environment with is critical bearing on all aspects of community welfare. 12

The report further pointed out that:

...the development process thrives on the use of resources from the environment...continuing exploitation of material resources naturally accelerate their scarcity and may result in environmental degradation...most environmental resources are finite and in most cases are non-renewable... 13

The establishment of the National Environment Secretariat (NES), in February of 1974 is another example of the Government's attempt to spread environmental awareness to the public.

The creation of a whole government ministry in 1979, devoted entirely to the matters of Environment and Natural Resources - The Ministry of Environment and Natural Resources - was another indicator to the felt need of "educating" Kenyans about the environment, since environmental issues emanating from the Ministry would reach the general public through the mass media.
The decision of the Stockholm Conference, (1972), to make Nairobi UNEP Headquarters, and the subsequent hosting of United Nations Centre of Human Settlement, UNCHS (HABITAT) in Nairobi Kenya have played a key role in sensitising Kenya on the issues of environmental education.

In collaboration with the UNESCO/UNEP, the Kenya Science Teachers College (KSTC) has been involved in preparing materials for environmental science for a long time. Kenya Science Teachers College has also, in the recent past, developed a one year course on environmental science which involves the study of ecology, resource conservation, pollution, energy and food circulation. This course embodies both practical field work and theory work.

EE was given proper formal status by "The Report of the Presidential Working Party on the Second University". Environmental Conservation and protection was one of the major concerns of the working party. The report recommended the establishment of a school of environmental studies at the Second University (Moi University).

The new Kenyan Education System, the 8-4-4, has
incorporated EE in the education curricula at all the levels of the education system. Different approaches for teaching EE have been used at the different levels of education. For example, in the primary school curriculum, EE topics have been infused in the Geography, History, Civics - G.H.C. (Combined course), Science and Agriculture and Home Science syllabi. The same approach is being used in the Primary Teacher Education curriculum. In the Diploma colleges, EE is offered as a separate subject.

Muthiani's project (1986), indicates that, Moi University offers a full EE course to her undergraduate students.

In addition, Kenyatta University has established a centre for EE, within the Faculty of Education. According to "BERC" Bulletin, November 1987, Issue No.16, the Centre has been in operation for the last six years and offers M.Ed. degrees in EE, i.e. in a programme for training teachers for Diploma Colleges in Kenya. The Centre for Environmental Education (CEE), also offers a compulsory EE introduction course (Unit) for B.Ed. students and this same Unit is compulsory to all Postgraduate Diploma in Education (PGDE) students. In addition, the Centre has proposed an
M.Ed. degree in EE which is going to be implemented in the near future.

Further, the Kenyatta University Centre for Environmental Education introduced, as from September 1987, a specialised EE postgraduate course units for the M.Ed. (P.T.E.) students. The writer/researcher of this project took the course in preparation for teaching EE in the Kenya Primary Teacher Training Colleges.

At the University of Nairobi, the Faculty of Engineering has recently begun to offer degrees in Environmental Health and Engineering. The course is aimed at helping students to be able to deal with a wide range of constitutional and mechanical problems pertaining to the environment.

1.3 EE AND THE INFORMAL SECTOR

The National Environment Secretariat (NES) Management Report (1978) notes that, the out of school EE programmes in Kenya feature in:

1) The work of the N.E.S. itself; N.E.S. works in
close liaison with the K.I.E., the Kenya Public Universities, the National Museum, relevant government departments, the Wildlife Club and the Scouts and Guides movements. If requested, N.E.S. can help supply teaching resources for EE to the formal education sector.

2) The board of adult education.

3) The women's organisations, especially

i) the National Council of Women, a body which has 28 affiliated member organisations, Clubs and societies, and which initiated the establishment of the popular "Green Belt" projects in various parts of the country.

ii) The Y.W.C.A. also sponsors short courses for women in urban areas whereas in Nairobi, the "Nairobi Home Economics Training Centre" organises courses on personal and domestic hygiene - clean water supply and waste disposal.

iii) The Ministry of Agriculture has a programme on "Home Economics" which reaches about 26 districts of Kenya through Farmers' Training Centres.
iv) Women Groups throughout the country are currently involved in "self-help" projects or activities whose primary aim is to enable women to generate incomes without degrading the environment.

4. Health Education: courses stressing motivation and teaching methods for medical students and paramedical personnel have been organised in Kenya. The aims are:
   i) to promote public health and EE programmes,
   ii) to strengthen national health education service.

5. The National Youth Service (NYS) initiated in 1964 has eight units distributed throughout the country which try to practically provide solutions to environmental problems through such activities as building gabbions to stop soil erosion.

6. Youth Organisations:

   Teachers workshops on conservation and on broader aspects of EE were launched by the Wildlife Clubs of Kenya in 1972, and annual attendance now represents teachers from academic institutions at every level. This gives rise to better leadership, helping individual clubs to base their activities on clearer understanding of conservation and resource management.
In addition, the 4K and the Young Farmers Clubs help students at primary and secondary school levels respectively, to develop a creative interest in farming and ability to adapt to the environment in order to develop concern and skill in the conservation of soils, vegetation and wildlife.

1.4 CONCLUSION

To conclude this background information on the development of EE, the researcher would like to point out that, EE is of significant importance to Kenya because Kenya has been confronted with many environmental problems which are likely to get out of control if proper measures to alleviate them are not taken.

Firstly, Kenya has, currently, the highest population growth rate in the world - about 4% per annum. This means that there is an urgent need for Kenyans especially the young, to be taught how to control population for the benefit of all Kenyans. Population is an environmental problem which can have many other attendant problems such as unemployment, illiteracy, malnutrition disease, stress, resource depletion and misuse etc.
Secondly, the mainstay of Kenya's economy is agriculture. Hence young Kenyans need to learn proper methods of farming which would help combat soil erosion and hence desertification. Also, there is need to learn about the dangers and benefits of using pesticides and fertilizers so that chemical, water and air pollution are prevented.

Thirdly, a big portion of Kenya's population practises pastoralism. This can pose dangers of soil erosion and desertification especially in the arid and semi-arid lands which comprise the greatest part of Kenya's land.

Fourthly, Kenya has been quite famous for her wildlife, a sector which has earned her great income for a long time. There is need to educate Kenyan youth on the importance of wildlife and how to preserve it so that species do not get extinct.

Fifthly, Kenya is blessed with abundant waters - she has rivers, lakes, and even a coastline. Her population, especially the young needs to be aware of water and marine pollution so that they can protect Kenya's waters from such pollution.
Sixthly, the problem of settlement has been rampant in the country since independence due to the rural-urban migration. This has led to the development of urban slums in which living conditions are deplorable. The Kenyan youth needs to be educated on proper settlement systems.

Due to the rapid development of the industrial sector in Kenya, serious chemical pollution is already eminent. Proper management of industries is an issue on which the Kenyan youth needs to be educated about, if optimum benefits have to be reaped.

Lastly, Kenyans need to be made aware of the possible sources of energy available to her, and how they can be utilised for optimum benefit. All the above goes to show that EE is a necessity in Kenya today.
### 1.5 LIST OF ABBREVIATIONS

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<tr>
<td>A.P.S.P.</td>
<td>African Primary Science Programme.</td>
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<tr>
<td>E.E. (EE)</td>
<td>Environmental Education.</td>
</tr>
<tr>
<td>G.H.C.</td>
<td>Geography, History, Civics (A combined Course).</td>
</tr>
<tr>
<td>K.P.S.P.</td>
<td>Kenya Primary Science Programme.</td>
</tr>
<tr>
<td>K.I.E.</td>
<td>Kenya Institute of Education.</td>
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<tr>
<td>K.S.T.C.</td>
<td>Kenya Science Teachers' College.</td>
</tr>
<tr>
<td>L.R.C.</td>
<td>Learning Resource Centre.</td>
</tr>
<tr>
<td>M.ED. (PTE)</td>
<td>Master of Education (Primary Teacher Education).</td>
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<tr>
<td>N.E.S.</td>
<td>National Environment Secretariat.</td>
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<tr>
<td>N.Y.S.</td>
<td>National Youth Service.</td>
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<tr>
<td>P.T.E.</td>
<td>Primary Teacher Education.</td>
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<td>P.1</td>
<td>Primary School Teacher Grade I.</td>
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1.6 STATEMENT OF THE PROBLEM

This project is a response to the need to investigate how Environmental Education is being taught at the Primary Teacher Training Colleges in Kenya, with a particular reference to the teaching/learning resources available in the colleges.

Availability of teaching/learning resources reflects on the environmental issues which students are exposed to while undergoing their teacher training. Subsequently, it can be assumed that the same issues will be taught to the primary school children by the teacher trainees upon graduation from the colleges. It can therefore be possible to infer whether EE is being promoted at the basic and most important level of our education system or not.

1.7 OBJECTIVES OF THE STUDY

The objectives of this study are to find out the following:

1. The types of resources available that are used in the teaching/learning of Environmental Education in Primary Teacher Training Colleges in Kenya.
2. The various sources of those resources.

3. Whether the tutors who teach EE are qualified and hence able to select and use EE resources effectively.

4. Whether the tutors/students make their own resources for teaching/learning EE.

5. Whether the tutors use the immediate environment to teach Environmental Education.

6. Whether the tutors have an opportunity to share ideas on the use and production or acquisition of EE teaching/learning resources, with tutors from other institutions.

7. How the tutors store the materials they use for teaching EE.

8. Whether the tutors have an opportunity to share ideas on the use and production or procurement of materials for teaching EE.

9. How the teachers store the materials they use for teaching EE.
1.8 SIGNIFICANCE OF THE STUDY

Statistics show that the largest part of Kenya's population is composed of youngsters under fifteen years old. The future survival of the Kenyan environment is dependent on the ability of the youth of today to preserve the environment tomorrow as they struggle to wrench a living from it. The words of Tolba, Executive Director of UNEP,

I am asking the youth of the world to help us work on the side of the future to see to it that when the older generation passes on the inheritance of the earth, they will hand it over to a young generation which knows how to preserve the long natural chain of resources that sustain us all.  

apply to the Kenyan youth today more than ever before.

The only way to prepare the Kenyan youth for such task is by giving them proper environmental orientation when they are young - in primary schools. The task of preparing the youth lies on the teacher and the teacher can only be effective if he has the proper tools for the job. This is the reason why the researcher/writer of this project has decided to focus her attention on the survey of the teaching resources
used to teach EE by tutors in Primary Teacher Training Colleges. Availability or lack of teaching resources at teacher training level will lead to a chain of events whose end result will affect the primary school child either positively or negatively.

The teaching/learning of EE in primary schools and Primary Teacher Training Colleges has been given prominence in the present education curricula for both primary schools and Primary Teacher Training Colleges. The general and specific objectives for teaching G.H.C. (combined course) in both lower and upper primary are centred around the child's physical and cultural environments, and issues related to environmental degradation: thus according to the objectives, the Geography, History, Civics (G.H.C.) course appears to be an EE based course. Isolated environmental issues are also tackled in the science and agriculture and home science syllabi.

In the same way, the Primary Teacher Education Pre-service Course Draft Syllabus for Pl, G.H.C. (combined course), places central to the course the teaching/learning of EE. The introduction reads in part, "...it (G.H.C.) should therefore be understood
as a genuine inter-disciplinary study of human influences on his environment and how the environment in turn influences him". 18

The other isolated environmental issues are covered in the agriculture, science and home science syllabi.

Therefore, due to the importance given to the teaching of EE in both primary schools and the Primary Teacher Training Colleges the researcher decided to establish whether the objectives of teaching EE in those institutions are being achieved. A survey of the teaching resources in Primary Teacher Training Colleges would help indicate the position, for the reasons given above.

This study is therefore expected to be of interest to, and use by the following:

1. The Ministry of Education.
2. The Kenya Institute of Education (KIE).
3. Primary Teacher Training College tutors.
4. Primary school inspectors and the entire primary school administration.
5. The National Environment Secretariat.
7. Any other interested educators from educational institutions and the general public, the International Environmental Education Programme personnel and members of non-governmental organisations.

1.9 BASIC ASSUMPTIONS OF THE STUDY

The basic assumptions to this study are as follows:

a) that there are not enough resources available for tackling effectively the EE aspects or components of the Primary Teacher Training Curriculum.

b) that tutors in the Primary Teacher Training Colleges are not aware of how and where they can obtain resources for teaching EE.

c) that Primary Teacher Training College tutors are not committed to teaching issues of EE as they ought to due to:
i) the interdisciplinary approach used in which EE can be easily obscured.

ii) lack of readiness on the part of the tutors.

iii) lack of knowledge as to what types of resources are available and where they can be secured.

1.10 LIMITATIONS OF THE STUDY

There are seventeen Primary Teacher Training Colleges in Kenya, located in different parts of the republic. This study will confine itself to only four of these colleges namely: Highridge, Thogoto, Machakos and Kilimambogo Teachers Colleges, situated not more than 100 kilometers from each other.

The sample will therefore not be as representative as the researcher would have liked. The major reason for this limitation is the time factor. The researcher picked on the colleges which would be easily accessible within the limited time available to the investigator. However, the information
gathered in this research study can be generalized to the other Teacher Training Colleges in Kenya not included in the study.

1.11 DEFINITIONS OF THE SIGNIFICANT TERMS

Educational Resources: Sometimes referred to as "resources" or teaching/learning aids. In this study "resources" refer to printed materials, audiovisual materials, realia; real things or objects, and community based resources such as resource persons and sites, that the teacher/learner uses as an aid to the teaching/learning processes.

Learning Resources: Those resources which enhance learning, e.g., by promoting memory, helping a learner change his attitude to the desired one, or helping him acquire a skill faster than would have otherwise been the case.

Teaching Resources: Those resources which help a teacher achieve his teaching objective faster and more easily.
Supplementary Books: Books used by the tutor over and above the text books that are recommended in the syllabus.

Tutor: A college teacher who guides the studies of a number of students in his subject area.

Primary Teacher Training College: An institution in which prospective teachers for primary schools are trained.

Teaching/Learning Resources: Resources (teaching aids) which will enhance teaching and learning simultaneously.

8-4-4: An education system which Kenya adopted in 1985. It means eight years of primary or basic education, four years of secondary education and four years of university education.
CHAPTER II

2.0 REVIEW OF RELATED LITERATURE

2.1 Introduction

Available literature indicates the importance of resources in enhancing effectiveness in the teaching/learning situations. The use of resources implies involvement of many of the human senses at the same time, in the learning process.

Psychologists have told us that we learn only 11% through the sense of hearing, and 83% through the sense of sight. We retain 20% of all that we see and 50% of what we both see and hear. It is therefore clear that the use of more senses leads to more effective learning.

Jowi and Njuge (1986) point out that,

For proper communication and learning, students want certain media available and used, not only because media are interesting and seem to make school time pass more quickly, but because when various senses are used in learning, there will be greater perception, understanding and reinforcement, and hence retention of the subject matter.
Comenius once wrote that the commencement of knowledge must always come from the senses. Many educators and educational psychologists have over the years emphasised the use of teaching aids in learning for the simple reason that, they necessitate the utilization of more than one sense.

Summer, in his book, *Visual Methods in Education*, wrote,

"Enthusiasts in the cause of teaching aids in education have looked to them to redeem teaching and learning from the folly of verbatim." \(^{20}\)

and Patel, (1986) argues that:

If a learner is to gain information and understanding about a theoretical concept, visual aids will do the job; but if a learner is to acquire a certain skill, then the aid may be in form of simulation exercise. \(^{21}\)

Patel further says that "materials (resources) should be used as an integral part of learning activity in order to achieve the highest level of understanding within the context of their subject matter". \(^{22}\)

Therefore, teaching/learning resources play a very significant role in education.
In his editor's introduction to, *Audio Visual Materials: Their Nature and Use* (1962), Guy Fowkes wrote,

> hearing, seeing, looking and listening are the primary means of human learning. What we see and hear markedly influence how we behave..., the teacher today... must become intimately familiar with learning materials in order to approach complete effectiveness.

EE is a relatively "new" field of study and hence for teachers to teach it effectively there is need to use a wide variety of stimulating teaching/learning resources that appeal simultaneously, to as many senses as possible.

Due to its recent establishment, it is unlikely that one will find much literature on the use of teaching/learning resources for EE, especially in the developing countries since very little research has been done on the subject. The related literature materials that will be reviewed in this study will centre around:

a) the meaning of resources.

b) the importance of using teaching/learning resources in teaching EE.
c) selection of resources for EE.

d) how tutors and students can use resources in teaching and learning EE.

e) summary of the literature review.

2.2 The meaning of Resources

In an attempt to define "resources", Davies (1975) wrote,

"In the broadest sense, resources can be taken as anything in the school or its environment that may be used to help teaching or learning; these may include, people in various guises, buildings and their surrounding physical plant and even actions resulting from a change in any particular section."

The above is rather a narrow definition of resources, since teaching/learning resources do not have to be necessarily confined to the school. A teacher can take students away from the school to a site (resource material) by observing or manipulating which learning can be reinforced. Resource persons can also be invited to the school or visited at their places of work.

Davies further defines resources as; "any items
living or inanimate used during the learning process". He tries to differentiate between teaching and learning resources by alluding that materials intended for use by a teacher, to improve or extend his teaching are referred to as "teaching aids", whereas those used as "an item or environment that has been structured so that a user may be expected to learn from it, i.e. achieve one or more defined goals, is referred to as a learning resource".

In an attempt to distinguish between teaching and learning resources, Ogomo (1985), argues that the difference comes in the way a particular resource is used. He says that if a teacher uses a resource to convey some information to the students, such a resource can be conveniently referred to as a teaching resource. On the other hand, he argues that if the resource is given to the students to learn from it by themselves, with or without the aid of the teacher it can be referred to as a learning resource.

Both Davies and Ogomo seem to emphasise the accessibility to and use of resources by the teacher or student to aid teaching or learning respectively, as the criterion for distinguishing between teaching
and learning resources. However, although there can be learning without teaching, it can be argued that in a formal school situation the student's activity which results to learning has been planned by a teacher, the teacher will have made some contribution to the learning thus making the learning resource a teaching resource as well; thus there is no significant difference between teaching resources and learning resources. In any case, the ultimate goal of teaching is to cause learning and therefore if a resource makes teaching effective, it affects learning positively.

2.3 The Importance of Using Teaching/Learning Resources to Teach Environmental Education

The subject matter of EE deals with material things. These material things themselves can be utilised as resources. They are things that can be observed, felt, smelt and analysed. EE is concerned with fostering skills, principles and attitudes that should govern the utilization of the environment both natural and man-made. EE should be made a practical course as much as possible.
The basic concepts in EE are related to the functions of ecosystems, the inter-relationships among different types of populations – terrestrial and marine, belonging to flora and fauna species – and how they extract supporting nutrients from the non-living resources such as soil, minerals solar energy, air, water, etc. It especially deals with the ways in which man utilises these natural resources. Poor utilization of the resources lead to a multitude of environmental problems which cause general environmental degradation, while proper use of the resources can lead to enhancement of good environmental conditions and preservation of the resources.

Teaching/learning resources are needed in the teaching/learning EE to help children understand the concepts involved in the inter-relationships outlined above. Therefore, teaching resources such as flow-charts; pictorial illustrations or pictures, real things, visits to environmentally degraded areas or places where pollution is rampant are all necessary in teaching EE. Since the major aim of EE is to help the learner develop the proper attitudes, skills and values that would enable him to utilise the environment
conservingly, real experience with the environment is of special importance in teaching EE, since it would help the learner to integrate the above concepts in a more meaningful and realistic manner.

The Tbilisi Conference (1977) emphasised the need for training teachers of EE. Recommendation No.18 was entirely devoted to this need. The recommendation emphasises that, "teachers in training should be given an understanding of as wide a range as possible of educational materials and aids with special reference to low cost materials and opportunities for adaptation".27

To reiterate on the importance of resources, the African Sub-regional Conference held in Nairobi, August 1986 declared,

We must organise seminars and workshops to produce relevant resource materials and wherever possible, be exposed to new ideas/approaches at national, regional and world levels. 28

The workshop pointed out that, "ways and means of stimulating awareness include use of mass media e.g. press, radio, etc."29 Among the methodologies
recommended for the training levels was, collection of available materials/literature. Attention of target groups was drawn to the existence of a collection of literature and audio-video teaching materials.

The paper on the Development of EE in Kenya, which was presented at the Tbilisi Conference by the Kenyan delegation pointed out the importance of teaching resources for EE. The paper read in part,

...we in Kenya are interested in the special kit developed in Pakistan to use by teachers which enables them to produce inexpensive instructional materials on their own. 30

The paper further alleged that,

At primary level, educational resources have been developed to cater for whole seven years of primary education including the preparation of materials for teachers in Teachers Colleges. 31

This implies that since the formalization of EE, the Kenyan educational system has been aware of the need for teaching/learning resources for EE. This project will help establish the extent to which this need has been fulfilled.
Muthiani, (1986), concluded that lack of trained personnel for teaching EE in Diploma Colleges was retarding the establishment and development of the subject at the colleges. Muthiani further notes: "resources can enhance teaching and learning in a college especially if both the tutor and the student have access to them". 32

Jackson (1976) wrote, "materials and equipment can facilitate and improve the quality of environmental studies in a college" 32 and Muthiani (1986) pointed out that,

Resources create interesting teaching/learning situations to students and can be very strong motivating factors for students to do more researching in EE". 34

It can therefore be concluded that teaching/learning resources play a very significant role in the teaching/learning of EE. Collecting and compiling environmental teaching/learning resources, for example, from newspapers and magazines can make learners more involved in the subject. It is also important that students participate in activities aimed at combating environmental degradation, for example, afforestation, digging
bench terraces, gabbion building, visiting and helping the needy, etc. so that they can learn about environmental problems from first-hand experiences, and hence be more effective promoters of environmental awareness.

2.4 **Selection of Resources for EE**

Resources can be grouped under the following categories:

i) Audio-visual, that is, recorded audio programmes, photographs pictures, etc.

ii) Printed resources; that is books, pamphlets, maps, charts etc.

iii) Realia; that is real items such as bones, stones, animals, people etc.

From the above categories of resources, the tutor should select those that appeal to specific learners and are relevant to the aim of the lesson and its material contents.

According to Gibson (1975), the following suggestions which a teacher should consider when
selecting teaching resources are given:

1. the ends the resources serve in the teacher's hands.

2. the ends the resources serve in the pupil's hands, and

3. the value the resources possess in themselves.

The above points suggest the importance of resources to the end results for both the teacher and the learner. This end result should therefore guide the teacher in selecting resources. The tutor should carefully weigh the contribution resources make to the teaching/learning processes.

Ikumi, (1985), wrote that the basic question may be, "will they (resources) help the learner in achieving this goal?" Therefore before one can make any valid decision about which material to use and how best to use it for educational reasons, there must be a firmly defined basis for those decisions.

Ikumi's contention that a teacher should look at teaching aids as only supportive material that
will only help him to achieve his purpose indicates that the teacher should be completely versed in his subject matter.

In addition, materials for teaching/learning EE should be chosen on the basis of how the class is going to be managed, how the teacher intends to present the aid and how the class would be organised.

As Wright (1976) says, the choice of resources is affected by the age, interests, intelligence and experience of the learners. The physical circumstances of the classroom, the cost and convenience of the materials are also important aspects to consider.

Jackson (1976) pointed out that "...the main problem associated with EE materials is that of dissemination". It is necessary therefore that college tutors know what EE materials relevant to the topics or syllabi on which the teaching is based.

The EE syllabus cannot recommend all the viable resources. The tutor should therefore be on the look out for newly produced materials for example, those
published yearly in journals and other magazines, publications by such bodies as UNESCO, UNEP, HABITAT, and newly researched projects or thesis, etc.

For realia resources, newspapers and periodicals can be very useful since they could highlight on the new areas that have suffered environmental degradation or current types of environmental degradation. The tutors can make use of the information by paying visits to the sites, taking photographs, film strips or slides of the scenes to bring to the class.

Also, tutors can try to check the books that may have been produced lately on EE, and also books on other related disciplines to see whether they have chapters or sections relevant to the environmental issues the class may be dealing with.

2.5 **SUMMARY OF LITERATURE REVIEW**

From the foregoing discussion, it can be concluded that;

a) Resources mean anything that will make the teaching/learning processes more effective.
b) With proper use, resources can facilitate and enhance learning;

c) The choice of resources and organisation of the learning situation determine their effectiveness.

d) Total involvement by students in learning EE is necessary for students to internalise the concepts, develop the skills and form the right attitudes to environmental utilization.

e) What is required for effective dissemination of EE are, the tutor's proper orientation and experience in teaching EE together with adequate resources both book and community based.
CHAPTER III

3.0 DESIGN OF THE STUDY

This research project employed two methods of gathering information. The first method of gathering data was a questionnaire for tutors of Geography, History, Civics - G.H.C. (a combined course), Science, Agriculture and Home Science.

The questionnaire was used to provide information such as:

i) the experience the respondents had in teaching the integrated parts of EE in G.H.C. (a combined course), Science, Agriculture and Home Science.

ii) what the sources of the resource materials were,

iii) the criteria that the tutors used in selecting the resources for the teaching/learning experiences.
iv) whether the tutors were aware of the importance of using teaching aids to teach EE,

v) how resources for teaching EE were stored,

vi) whether the tutors made use of the community based resources,

vii) the various environmental issues that the tutors had managed to tackle in their teaching,

viii) whether tutors/students made their own resources for teaching/learning EE, and,

ix) whether tutors got a chance to share their ideas on the production of teaching resources with tutors from different colleges.

The second method was a check-list. This method was used to confirm information on:

i) the sources of different resources,

ii) the available teaching/learning resources,

iii) the different types of teaching/learning resources that were used.
3.1 THE SAMPLE

The survey's target population was four Primary Teacher Training Colleges namely: Highridge, Thogoto, Machakos and Kilimambogo.

For the questionnaire, the actual sample was drawn from the following subjects tutors: G.H.C. (a combined course), Science, Agriculture and Home Science.

The researcher picked on any two tutors from each of the above four subjects. Therefore, a total of eight tutors from each college responded to the questionnaire. Multiplied by four (4) colleges gave a sample size of 32 respondents.

The researcher was helped with the information required on the checklist by the heads of the four subjects mentioned above; thus G.H.C., Science, Agriculture and Home Science or the heads of the departments under which the subjects fall; thus, Science Department, Creative Arts Department and the Social Sciences Department.
3.2 METHODOLOGY

This research study utilised the following methodologies:

1. a questionnaire
2. a check-list.

Each college was visited twice or thrice. During the first visit the respondents were identified and questionnaires given out. Any questions from the questionnaire were clarified. The respondents were then asked to complete the questionnaire in their own free time.

During the second and third visits the questionnaires were collected and check-lists completed. All the resource that were available for teaching EE in each department were recorded with the help of the heads of the subjects or departments.

Data Analysis

The data collected was analysed on the basis of the research questions posed in this study, and were reported in Chapter Four of the project.
Presentation of Data.

The data was presented in percentages and frequencies.

After data analyses, conclusions were drawn, and recommendations and suggestions for further research made in Chapter five of the project.
4.1 Introduction

This study involved 32 tutors who taught the four subjects in which EE topics were infused. These subjects were:

- Geography, History, Civics - G.H.C. (a combined course), Science, Agriculture and Home Science.

A copy of the questionnaire was presented to each of the 32 respondents. They were asked to read through, in case there were some unclear points or statements. The researcher was available to clarify any points from the questionnaire that needed clarification.

The check-lists were also handed over to either the subject heads or heads of the Departments. Altogether, four check-lists were completed at each college.

The questionnaire and the check-lists were successfully completed in one week's time after which
the researcher went round the colleges collecting
them.

In order to observe the general trend of the
availability and use of materials for teaching/
learning EE in Primary Teacher Training Colleges,
the responses from both the questionnaire for tutors
and the check-lists were tallied in separate tables
and percentages calculated. The findings have been
reported in this chapter. The discussion or the
findings include the researcher's own comments
deduced from the responses and some oral interviews
which the researcher inevitably would carry out from
time to time.
4.2 FINDINGS:

TABLE 1: GENERAL TEACHING EXPERIENCE AND EXPERIENCE IN TEACHING ENVIRONMENTAL EDUCATION (EE)

<table>
<thead>
<tr>
<th>General teaching experience in years</th>
<th>No. of Tutors</th>
<th>% of the whole sample</th>
<th>Experience in teaching EE in years</th>
<th>No. of Tutors</th>
<th>% of the whole sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>-</td>
<td>-</td>
<td>00</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>1 - 3</td>
<td>7</td>
<td>22</td>
<td>1 - 3</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>4 - 7</td>
<td>6</td>
<td>19</td>
<td>4 - 7</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>8 - 11</td>
<td>7</td>
<td>22</td>
<td>8 - 11</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>12 - 15</td>
<td>4</td>
<td>12</td>
<td>12 - 15</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>16 - 19</td>
<td>5</td>
<td>16</td>
<td>16 - 19</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>20 - 23</td>
<td>2</td>
<td>6</td>
<td>20 - 23</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Over 24</td>
<td>1</td>
<td>3</td>
<td>Over 24</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>32</td>
<td>100</td>
<td>TOTAL</td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>

Out of the 32 tutors who responded to the questionnaire, only eleven, (34%) had the expected teaching experience of between one and three years (1-3). The "new" Primary Teacher Training Education syllabi for the pre-service trainees, introduced at the advent of the 8-4-4 system of education was implemented in the Primary Teacher Training Colleges in May of 1986. It was according to those syllabi that EE was to be taught as an intergrated subject.
within G.H.C. (a combined course), Science, Home Science and Agriculture.

An other eleven, (34%) of the 32 respondents had not taught EE topics at all; at least not regarding them as EE topics. The rest of the respondents had taught EE for an unexpected number of years, ranging between 4 to 19 years.

The above data displayed some unawareness by some tutors, of the presence of EE topics within G.H.C. (a combined course), Science, Agriculture and Home Science. Table two below shows some of the sources from which the teachers of EE obtained materials for teaching EE.
### TABLE 2: SOURCES OF MATERIALS FOR TEACHING ENVIRONMENTAL EDUCATION (EE)

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Education and the Kenya Institute of Education (K.I.E.)</td>
<td>16</td>
<td>50</td>
</tr>
<tr>
<td>Commercial sources e.g. Bookshops.</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>National Environment Secretariat (NES), Presidential Commission for Reafforestation</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Non-governmental organisations e.g. Environment Liaison Centre</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>National, Institutional &amp; Other Libraries</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>UNEP, UNESCO, UNCHS (HABITAT) and other UN bodies like FAO, WHO, IPPF etc</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Tutor and student made materials.</td>
<td>15</td>
<td>47</td>
</tr>
<tr>
<td>Physical Environment through field trips</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>No source indicated.</td>
<td>7</td>
<td>22</td>
</tr>
</tbody>
</table>

Note: In this question a respondent could indicate as many sources as he got materials from.

\[ N = \text{The number of tutors who mentioned a particular source.}\]

\[ % = \text{Percentage of the total population of 32.}\]
TABLE 3: RESOURCES OBTAINED FROM THE MINISTRY OF EDUCATION AND THE KENYA INSTITUTE OF EDUCATION, BY SUBJECTS

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>NO. OF TUTORS</th>
<th>THOSE WHO RECEIVE MATERIALS</th>
<th>PERCENTAGE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.H.C. (a combined course)</td>
<td>8</td>
<td>6</td>
<td>75</td>
</tr>
<tr>
<td>Science</td>
<td>8</td>
<td>6</td>
<td>75</td>
</tr>
<tr>
<td>Home/Science</td>
<td>8</td>
<td>3</td>
<td>38</td>
</tr>
<tr>
<td>Agriculture</td>
<td>8</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>19</td>
<td>60</td>
</tr>
</tbody>
</table>

75% of tutors of G.H.C. (a combined course) and science, each, indicated that they received some materials from the Ministry of Education and the K.I.E. Most of these materials were syllabuses, teaching guides and pamphlets on EE.

Although 50% of the Agriculture tutors indicated that they received materials from the Ministry of Education, the type of materials that they indicated
to have received were farm implements and some recommended books for Agriculture. The Home Science tutors received Home Science equipment such as cookers and dishes as well as charts on nutrition.

Compared to the total number of the general teaching/learning resources which each subject had, the interviewed tutors stated that the materials that were related to EE topics were really minimal. Therefore, although Table 3 above indicates that 75% of both Science and G.H.C. tutors got materials from the Ministry of Education and the K.I.E., and that 50% of the Agriculture tutors also got EE materials. It will be noticed in the "Observed Materials Relevant to EE", pages 69-70, which were compiled from the check-lists, that the materials obtained from the Ministry of Education and the K.I.E. were only syllabi, teachers' guides and some pupils' books.

**TABLE 4: CRITERIA FOR SELECTING RESOURCES**

<table>
<thead>
<tr>
<th>CRITERION</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson objective</td>
<td>14</td>
<td>44</td>
</tr>
<tr>
<td>Nature of Topic</td>
<td>28</td>
<td>86</td>
</tr>
<tr>
<td>Level of students</td>
<td>14</td>
<td>44</td>
</tr>
</tbody>
</table>

N = Number of tutors who chose a particular criterion
% = Percentage
Note: In this question one tutor could indicate one, two or all of the criteria.

Table 4 above shows that majority of the tutors (86%) selected their teaching/learning resources according to the nature of the environmental topic. This is an appropriate criterion for EE since EE is mainly a practical subject which aims at developing awareness, knowledge, skills and positive attitude towards the environment.

Fourteen out of 32 respondents chose "Lesson objective" as a criterion and an other fourteen respondents chose the "level of students". These are also important criteria for selecting teaching/learning resources. On the whole, it is worth noting that at least the tutors used some criterion when selecting teaching/learning resources for EE.

The other criteria indicated by the tutors apart from the above three were: the cost of the resources and whether they were readily available or not.

Responding to the item "d" of the questionnaire which asks "why do you use teaching aids?"
all the tutors felt that teaching aids were necessary for effective teaching/learning processes.

They indicated that teaching aids played an important role in enhancing the teaching/learning processes. They also indicated that teaching aids made learning interesting, and stimulated the senses so that they became more perceptive. However, Table 5 below will indicate whether many tutors used teaching aids to teach EE topics or not.

**TABLE 5: THE USE TEACHING/LEARNING RESOURCES TO TEACH EE**

<table>
<thead>
<tr>
<th></th>
<th>No. of Tutors</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching aids used</td>
<td>22</td>
<td>69</td>
</tr>
<tr>
<td>Teaching aids not used</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>No response</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>32</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Table 5 indicates that 69% of the respondents used teaching aids to teach EE topics while 22% did not use teaching aids. On the other hand, 9% did not indicate whether they used teaching aids or not.

Some of the reasons given by those who did not use teaching aids were:

i) absence of the relevant teaching/learning resources for EE,

ii) that the use of teaching aids required more time which could not be afforded if the wide syllabi had to be covered,

iii) that, since EE was not taught as a subject per se, it was difficult to plan for EE teaching aids.

The first reason given for not using teaching aids can be partly true in view of the fact that not many materials have been produced locally to teach EE. However, the environment itself provides a wealth of resources and hence, only ignorance can lead to total lack of teaching/learning resources.
The second reason (ii) above, given for not using teaching/learning resources seemed to conflict sharply with the positive responses given under item "d" of the questionnaire, regarding the role of teaching/learning aids in the teaching/learning processes. The impression given by the response (ii) above is that in question "d"; tutors may have been referring to the general value of teaching aids in education regardless of whether they were conversant with, or did actually teach the EE contents integrated in their traditional subjects.

The third and last reason given (iii) above seemed to suggest that the inter-disciplinary approach used to teach EE can easily obscure the EE topics within a discipline if the tutors are not properly oriented with environmental issues. Proper orientation can sensitise tutors to environmental issues so that they are able to identify them in the syllabuses and treat them as environmental issues. Table 6 below provides information on the use of field trips by EE tutors while they teach EE. Field trips are an important aspect of teaching/learning resources for EE.
### TABLE 6: THE USE OF FIELD TRIPS TO TEACH EE

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of tutors who take students on field trips</td>
<td>13</td>
<td>41</td>
</tr>
<tr>
<td>No. of tutors who do not take students on field trips</td>
<td>19</td>
<td>59</td>
</tr>
<tr>
<td>TOTAL</td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>

N = Number of tutors out of the 32 respondents.  
% = Percentage

It is significant to note from Table 6 above that 59% of the tutors who responded to the questionnaire did not take their students on field trips. This might imply lack of enthusiasm on the part of the tutors in teaching EE topics. However, one tutor interviewed indicated that the Primary Teacher Training College Pre-Service Programme is too tight to afford time for EE field trips.
TABLE 7: ISSUES COVERED BY EE FIELD TRIPS

<table>
<thead>
<tr>
<th>ISSUES</th>
<th>NO. OF TUTORS</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water pollution</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Soil Erosion</td>
<td>9</td>
<td>28</td>
</tr>
<tr>
<td>Unsanitary living conditions</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Air pollution</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Noise pollution</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Note: In the above question, one respondent could enumerate as many issues as he had covered with students during field trips.

In this regard, it is clear from Table 7 above that not many tutors and students had been exposed to several EE issues.

If the tutors of EE had taken field trips more seriously, the above list of issues could have been much longer than in Table 7. Some of the other issues which could have featured in the list would have included:

- sites of resource mismanagement,
- desertificated areas,
- poor urban settlements (urban slums),
- marine pollution,
- urban traffic congestion,
- road-side farming,
- poor solid garbage disposal,
- poorly sited settlements, e.g. in flood prone areas,
- poor sewage disposal or lack of the system,
- misuse of children's play grounds in urban areas, and many others.

Meetings among colleagues teaching EE topics, or between tutors of EE and Ministry of Education officials to discuss the production and use of EE teaching/learning resources can help diversify the tutor's knowledge of the environmental issues that could be covered during field trips. Table 8A & B below help show the popularity and frequency of such meetings.
### TABLE 8A: TUTORS MEETING WITH COLLEAGUES OR MINISTRY OFFICIALS TO SHARE IDEAS ON PRODUCTION AND USE OF TEACHING/LEARNING RESOURCES FOR EE

<table>
<thead>
<tr>
<th>Activity</th>
<th>No. of Tutors</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutors meeting with colleagues</td>
<td>22</td>
<td>69</td>
</tr>
<tr>
<td>Tutors meeting with Ministry officials</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>No meeting with either Ministry officials or colleagues.</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>32</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### TABLE 8B: REGULARITY OF MEETINGS IN 8A ABOVE

<table>
<thead>
<tr>
<th></th>
<th><strong>MINISTRY OFFICIALS</strong></th>
<th><strong>COLLEAGUES</strong></th>
<th><strong>NEVER</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Tutors</td>
<td>%</td>
<td>No. of Tutors</td>
</tr>
<tr>
<td>Regularly</td>
<td>-</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>Occasionally</td>
<td>3</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Never</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Tables 8A and 8B indicate that tutors hardly ever met with either the Ministry of Education or K.I.E. officials to share ideas on the production and use of teaching/learning resources for EE. Only three out of 32 tutors met with the Ministry of Education officials occasionally.

Although 22 out of 32 respondents, that is 69%, of the respondents indicated that they met with their colleagues, the meetings were only occasional, according to Table 8B. Since there seemed to have been no motivation from the Ministry of Education, such meetings were bound to be unfruitful. Furthermore, the meetings were only within a given college, among colleagues who taught the same subject; thus there had not been an inter-college exchange of information on production and use of teaching/learning resources for EE. It is also worth noting that seven (7) out of the 32 respondents had not discussed the production and use of teaching learning resources for EE.

A library can be a useful resource from which printed materials for teaching EE can be obtained. Table 9 below shows how this facility has been utilised by tutors of EE to provide materials for teaching EE.
According to Table 9 above, 47% of the tutors who responded to the questionnaire did not use the libraries nearest to their colleges in search of materials for EE. 34% of the respondents used the libraries only occasionally whereas only 19% (6 tutors), claimed to use the libraries regularly.

Some of the major reasons given for not using the libraries regularly or never using them at all, were that; one, the libraries were situated far from the colleges and therefore it was expensive and time consuming to visit them.
The distances between the colleges - Highridge, Thogoto, Kilimambogo and Machakos and the libraries nearest to them ranged between two to sixty five (2 to 65) kilometres approximately; thus the distance between Highridge and the libraries nearest to it was between 4 and 5 kilometres, Thogoto, 2 and 20 kilometeres, Kilimambogo 25 and Machakos 65 kilometres.

Machakos Teachers College is the only one situated quite far from any public or university library. The tutors said that it was only in Nairobi where they could have access to such library.

Some other tutors felt that they had enough resources in their own college libraries. However, the check-lists (Appendix B) revealed that College libraries and college stores had quite few materials for EE. There were also tutors who felt that since the teaching time-tables did not cater for such visits, it was not possible to carry them out.
CHECK-LIST

4.3 OBSERVED MATERIALS RELEVANT TO EE

The following materials extracted from the check-lists which were completed by either subjects or departments' heads were found to be relevant for teaching EE in the Primary, Teacher Training Colleges:


The production by the K.I.E. of the Primary Teacher Education Draft Teaching Guide was a great attempt to incorporate EE in the G.H.C. (a combined course) syllabus. However, "the Guide" needs to be revised so that more EE can be incorporated in the relevant topics. The chapter on "urbanization" in the Teachers' Guide is given exemplary treatment of EE.

However, since the Primary Teacher Education is supposed to mirror the Primary School Curriculum, there is need to clearly include EE issues in the newly produced Primary School G.H.C., Science, Agriculture and Home Science text books. In the books which K.I.E. has produced this year, 1988 for the above subjects, environmental oriented topics have been included but the treatment given to them is not environmental Education oriented.

The other materials that appeared in the check-lists included the traditional Geography, History, Home Science and Agriculture textbooks. All these books have topics which can be expanded to include EE issues. However, it would only take a tutor who is specially trained in EE or Environmental Science to create EE topics out of the traditional ones.
On the whole, the checklists had limited variety of resources. The only other relevant materials that were cited were cuttings from the Wednesday and Friday Daily Nation papers and the Sunday Nation. These issues have had for the last few months, articles featuring on the environment. Some tutors have been cutting off the news features and compiling them for future use and reference.

The question on how the resources for EE available in Primary Teachers Colleges are stored is analysed in Table 10 below.

**TABLE 10: STORAGE OF TEACHING/LEARNING RESOURCES FOR EE.**

<table>
<thead>
<tr>
<th>PLACE</th>
<th>NO. OF TUTORS</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Library</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Departmental store room</td>
<td>10</td>
<td>31</td>
</tr>
<tr>
<td>Heads of department's office</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Staff Room</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>None</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>TOTAL</td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>
None of the colleges visited seemed to have any sizable resources for EE. Most of the text books which the tutors used were on traditional subjects for example, Science, Geography, Agriculture and Home Science, in which isolated sections with information relevant to EE were found. These books were either kept in the college library or the store from where tutors could borrow them for use.

Materials such as films borrowed from the British Council and charts obtained from the Ministry of Environment and Natural Resources were kept at the College's Learning Resource Centres (LRCs) syllabi and other K.I.E. pamphlets and circulars were kept in the Head of Department's office.

Although EE resources in Teachers Colleges were quite scarce, those that were available were properly stored.
CHAPTER V

5.0 SUMMARY, IMPLICATIONS AND RECOMMENDATIONS

5.1 Summary

According to Table I, only 34% of the respondents had taught EE consciously in Primary Teachers Colleges. Another 34% of the respondents had not taught EE at all whereas, 31% had taught EE topics for more years than was expected. There was no justification for a tutor who had a general teaching experience of 29 years to have taught EE for 9 years, or a tutor who had a general teaching experience of 16 years to have taught EE topics for 12 years. The expected period which tutors were supposed to have taught EE was between one and three years (1-3 years). EE was introduced as an integrated course in Primary Teacher Training Institutions in 1986.

Only small percentages of respondents claimed to have had received teaching/learning resources from the relevant sources. For example, according to Table 2, only one tutor had come across materials from UNESCO-UNEP. In addition, only two respondents had materials from the National Environment Secretariat, (NES).
Although 50% of the 32 respondents got materials for teaching EE from the Kenya Institute of Education (the K.I.E.) and the Ministry of Education, the materials were only syllabus pamphlets and Teachers' Guides to G.H.C. (a combined course), Science, Agriculture and Home Science.

It is expected that 100% of the tutors who teach EE should use teaching/learning aids since EE is a practical and activity oriented subject. According to Table 5, only 69% used teaching/learning aids. Failure to use teaching aids is an indication that ineffective methods are being used to teach EE.

Although field trips are an effective method of teaching EE, only 41% of the respondents indicated that they had used such trips. This also indicates that EE is not being taught effectively in Primary Teachers' Colleges. In addition, the analysed data showed that only very few of the numerous environmental issues had the field trips exposed the students to.

According to table 8A, the Ministry of Education, through the Inspectorate and the K.I.E, has played a very insignificant role in orientating tutors with
environmental issues as well as motivating them so that they can teach EE with enthusiasm and commitment. Sensitivity to environmental issues can cause tutors to go out of their way to look for teaching resources from public and institutional libraries other than their own only. If well motivated, the tutors would also have the initiative to look for teaching resources from the UN bodies headquartered in Kenya, namely UNEP, the UNESCO-UNEP library and the United Nations Centre of Human Settlements UNCHS (HABITAT). They could also consult with national bodies such as, the Presidential Reafforestation Programme, the NES and the relevant government ministries.

According to the checklist, no single book has been written and published on any of the environmental problems that Kenya is currently faced with.

It is also clear from the findings analysed in Chapter 4 that expert personnel on EE have not been used as resource persons by the Primary Teachers Colleges.

5.2 Implications:

The above discussion implies that:
1. Tutors in Primary Teachers Colleges have not been prepared to handle the subject of EE effectively.

2. The inter-disciplinary approach being used to teach EE is not effective due to lack of readiness on the part of the tutors.

3. The Ministry of Education needs to play a more motivating role by preparing a lot more materials for EE and meeting with tutors regularly to discuss the use of such materials.

4. Heads of Primary Teachers Colleges have not been sensitised to environmental issues and the need for EE field trips so that they can be willing to give their staff moral and financial support when it comes to acquisition of resources and making field trips.

5. There is not enough contact among tutors themselves especially at inter-college level.

6. Tutors of EE do not know where or how to obtain relevant resources to teach EE.
All the above points indicate that the teaching of EE in Primary Teachers Colleges has not yet taken off effectively.

5.3 Recommendations:

In view of the foregoing discussion regarding the availability and use of materials for teaching/learning EE in Primary Teachers Colleges, the researcher would like to make the following recommendations:

1. There is a need for the Ministry of Education through the K.I.E. and the Inspectorate Section of the Ministry, to try and write books on various environmental issues that Kenya is currently faced with. Such books would be used by tutors of G.E.C.E., Science, Agriculture and Home Science to supplement the materials which the tutors may already have for teaching EE.

2. There is a need for the K.I.E. in collaboration with the Inspectorate Section of the Ministry of Education, to be organising regular workshops for tutors of EE in which ideas on production and use of materials for teaching EE can be used to produce books for EE to be used in Primary Teachers Colleges.
3. There is a need also, to organise inservice courses for the tutors of EE in Primary Teachers Colleges in order to help create in the tutors, awareness of the EE issues and also a positive attitude towards the subject so that the tutors would be willing to enthusiastically teach the EE in their "traditional" subjects.

4. The present G.H.C. (a combined course), Science, Agriculture and Home Science syllabuses for the Primary Teacher Education Pre-service course, do not clearly indicate the environmental Education issues inherent in the subjects. This may have caused tutors not to pay due attention to the EE related topics. It is necessary for the Ministry of Education in collaboration with the K.I.E. to spell these issues out. This may call for the revision of the syllabi and also, all the series (from Standard One to Standard Eight), of the pupils books for G.H.C. (a combined course), Science Agriculture and Home Science which the K.I.E. has produced in 1988 as materials for helping implement the syllabi. The researcher read through the series of these books and realised that EE related topics had not been given the approach relevant to EE.
5. The Kenya national bodies such as the National Environment Secretariat (NES) and the Presidential Reafforestation and Soil Conservation Programmes need to make the Primary Teachers Colleges aware of the services they can render on environmental issues. This can be possible through visits or written communication. The colleges can then seek services of such experts.

6. There is a need for the Ministry of Education and the local universities to provide scholarships both locally and abroad for post-graduate studies geared towards producing teachers for EE in Primary Teachers Colleges. Kenyatta University has already taken a lead in this move by starting an EE course for the Master of Education (Primary Teacher Education) M.Ed. (P.T.E.) students.

7. The tutors entrusted with the teaching of EE in primary Teachers Colleges should, with the help of their students, try to collect their own materials for teaching/learning EE. This can be done by encouraging students to write projects on environmental issues that Kenya is currently plagued with. The projects can be combined and kept in the library
or the Learning Resource Centre for future use and reference. Also film-strips and slides can be prepared from pictures taken during field trips. These can be kept in the Learning Resource Centres for future use. In addition, important lectures by resource persons, on environmental issues can be tape-recorded and kept in the LRC for future use. Also, tutors and students can compile newspaper cuttings on the environmental features and keep them in the library for reference purposes.

5.4 Suggestions on areas for further research

This study was an attempt to investigate the availability and use of the teaching/learning resources for EE in Primary Teachers Colleges. The availability or lack of teaching/learning resources can be an indicator as to whether EE is being taught effectively at the Primary Teachers Colleges or not. If EE is not being taught effectively at the Teacher Training level, this would imply that EE is consequently not being taught effectively in primary schools. The total general consequence of this would be a fact that the Kenyan people are not being sensitised
enough on the environmental issues and problems, especially those that Kenya as a country is plagued with currently, or those that it is likely to encounter in the foreseeable future.

In order to find out whether EE is being given the prominence it deserves in the lower level of the Kenyan education system, and as a follow up of this study, the researcher of this project would like to make the following recommendations on areas of further research in the subject:

1. a survey of resources for teaching and learning EE used in primary schools in different parts of Kenya.

2. the attitude of tutors of G.H.C. (a combined course) Science, Agriculture and Home Science, in primary Teachers Colleges towards the teaching of EE.

3. the attitudes of primary school teachers towards the teaching of EE.
4. A survey of the problems that the Ministry of Education and the K.I.E. have had in trying to implement EE in Primary Teachers Colleges.

5. A survey of resources for teaching and learning EE in other Primary Teachers Colleges not included in this study.
FOOTNOTES


7. Ibid. Preface

8. Ibid. Preface.

9. BERC Bulletin No. 16, Kenyatta University, Basic Education and Environment, article by Mutunga, S.N. Title, "Practical Methodologies for Mobilising Primary School Age Level Children."

10. Ibid, Article by Rajabu, A.R.M.S., Experience of Tanzania in the Field of Environmental Education and Training", p.25.


16. Ibid, p.44.


25. Ibid, p.3.


28. Ibid, p.44

29. Ibid, p.46


31. Ibid, p.46.


BIBLIOGRAPHY


Ikumi, E.M. A survey of resources for teaching and learning Kiswahili in some primary schools of Central Division Iveti, South, Machakos District (Research Proposal). Kenyatta University, 1985.


Primary Teacher Education Pre-service Course

Primary Teacher Education Pre-service Course


Kenya Ministry of Education Science & Technology.


APPENDIX A

QUESTIONNAIRE

Dear Sir/Madam,

I am carrying out a research project entitled "A Survey of Resources for Teaching and Learning Environmental Education in Primary Teacher Training Colleges in Kenya".

I am therefore asking you to kindly help me gather some information by responding to the items in this questionnaire.

The research is for purely educational purposes and hence your honest response will be highly appreciated. Confidentiality will be guaranteed.

Thank you.

Yours faithfully,

L.M. Wambua
M.Ed. (P.T.E.) II YEAR STUDENT
EDUCATIONAL COMMUNICATION & TECHNOLOGY DEPT.
KENYATTA UNIVERSITY
QUESTIONNAIRE FOR THE TUTORS

1. a) Name of the college ____________________________
   b) i) Name of the person completing this questionnaire ____________________________
       ii) Rank/Title ____________________________
       iii) Teaching experience ___________ years.
       iv) Subject taught ____________________________
       v) Years spent teaching EE topics in your subject ____________________________
   c) Other subjects taught ____________________________

2. GENERAL INFORMATION

   a) Which materials are provided by the Ministry of Education for teaching EE? List them.

   1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________
   5. ____________________________
   6. ____________________________
   7. ____________________________
   8. ____________________________
   9. ____________________________
   10. ____________________________
b) Who provides the other materials?

1. 
2. 
3. 
4. 
5. 
6. 

c) What criteria are used by tutors in the selection of the resource materials?

Indicate by a tick (✓)

i) Lesson objective ( )

ii) Nature of topic ( )

iii) Level of students ( )

iv) Other (specify) ( )

d) Why do you use teaching aids?

(Write your reason(s) below)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

e) If you do not use any teaching aids to teach EE topics in your subject, provide your reasons.

________________________________________________________________________

________________________________________________________________________
f) What system is used in keeping a record of Environmental Education materials borrowed by members of academic staff, non-teaching staff and any other people from your collection? (Tick ✓ as appropriate).

i) List of names in an exercise book  

ii) A file  

iii) The materials are loaned by the college library  

iv) Other(s) (specify)  

---

g) (i) Do you take your students for field trips specifically for EE topics. Tick ( ✓ ) as appropriate

Yes  

No  

(ii) If Yes give the destination (places) to which you usually go for field trips:

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________
(iii) What EE issues do these trips expose your students to? Tick (✓) as appropriate.
- Water pollution (  )
- Soil erosion (  )
- Unsanitary (dirty) living conditions (  )
- Air pollution (  )
- Noise pollution (  )
- Water treatment (  )
- Marine pollution (  )
- Others (specify) ____________________________

h) Do you get opportunities to meet and share ideas on production and use of materials with.

Tick (✓) whichever is appropriate.
   i) Colleagues - Yes (  ) No (  )
   ii) Ministry of Education Inspectors -
       Yes (  ) No (  )
   iii) Others specify ____________________________

i) How often do you hold meetings with (h) above?

Tick (✓) as appropriate.

Regularly (  )
Occasionally (  )
Never (  )
If not at all (never), what are the reasons?


3. a) How far is the nearest University/other large library from your college?


Do you make use of the library in (a) above?
Tick (√) as appropriate.
On regular basis  ( )
Occasionally  ( )
Never  ( )

If never, what are the reasons?


APPENDIX B

A CHECK-LIST FOR THE RESOURCES AVAILABLE
(TO BE COMPLETED BY HEAD OF DEPARTMENT)

I. PERSONAL INFORMATION

a) (i) Name of the College ________________________

(ii) Subject being taught. Tick (✓) as appropriate.

Social studies (G.H.C.) ( )
Science ( )
Agriculture ( )
Home Science ( )

(iii) Group being taught. Tick ( ) as appropriate.

First years only ( )
Second years only ( )
Both first and second years ( )

II. GENERAL

Which books are recommended by the Ministry of Education, for teaching the EE topics in your subject?

1. Author __________________________________________
   Title __________________________________________
   Publisher _______________________________________
   Year ____________________________________________
b) Which books does your department use to teach EE that are not recommended by the Ministry of Education (List them).
<table>
<thead>
<tr>
<th></th>
<th>Author</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td></td>
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<td>10.</td>
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</table>
c) Other books

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
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<td>1.</td>
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<td>5.</td>
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</tbody>
</table>
d) Reference books e.g. Encyclopaedia EE dictionary etc.

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
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e) Journals and other non-book materials (e.g. newspaper cuttings, films, slides etc on various topics of EE.

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10. 

f) Indicate how you store and keep inventory of these resource materials. Place a tick ( ) in the appropriate box.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>Exercises or other books</td>
<td>Loose papers</td>
<td>Shelves</td>
<td>Cartons or Boxes</td>
<td>Lockers</td>
</tr>
<tr>
<td>Department Store-room</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College Library</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Room</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
g) (i) Elaborate on any of the methods provided in (d) above.

(ii) Other methods of keeping inventory of EE resource materials.

(iii) Other resource materials (a) recommended by the Ministry of Education.

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(b) Tutor made resources: e.g. pamphlets papers etc., written on various topics on EE.
c) Student-made resources, e.g. papers written as projects and subsequently used in teaching at the college.
d) Commercially manufactured charts, maps, slides, films etc.

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4. 
5. 

e) Others

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2. 
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