

A STUDY OF THE AWARENESS OF ENVIRONMENTAL
PROBLEMS IN KENYA AMONG PRIMARY SCHOOL
TEACHERS OF AMUKURA DIVISION, BUSIA
DISTRICT, KENYA

By:

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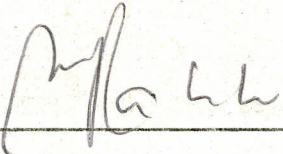


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DECLARATION

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

 1/2/91

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This project has been submitted for examination with my approval as University Supervisor.

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DEDICATION

DEDICATIONS TO MY

WIFE AND CHILDREN

MY ABILITIES MIGHT HAVE FAILED

YOU BUT YOUR ENCOURAGEMENTS

DIDN'T.

ACKNOWLEDGEMENT

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CHAPTER ONE

INTRODUCTION

1.0 Background to the Problem

Prior to 1972, environmental issues were not given serious consideration. Although attempts had earlier on been made to widen "environmental movements", this process was extremely slow. For instance, in the developed countries, a conservation movement appeared in the last decade of the 19th Century and the first decade of the 20th century. It was basically concerned with both efficient management of natural resources and the preservation of natural habitats and historic monuments. However, the widening of the "environment movement" in the second half of the 20th century brought three developments of major importance. First, the scientific and nature protection components grew together especially under the influence of professional ecologists. Second, appreciation of the environment grew in many countries outside Europe and North America. Third, and most important, the character of the approach changed. A much broader conception of the environment was adopted. The movement became concerned with literally all aspects of the natural environment: land, water, mineral, all living organisms and life processes, the atmosphere and the climate, polar ice-caps and remote ocean-deeps and even space.

Developments during the 1950s and the 1960s alerted humanity of the need to manage his environment adequately. Among those were the air pollution episodes in London and New York in 1952 and 1966, the fatal instances of mercury poisoning at Minamata and Niigata in 1953 and 1965 respectively, the reductions in aquatic life in some of the North American lakes, the deaths of birds caused by the unexpected side-effects of DDT and the massive oil pollution from the wreck of the Torrey Canyon in 1966. These widely publicized events caused many people in the developed world to fear that pollution was already jeopardising the human future. It is not surprising, therefore, that when the Stockholm Conference was held in 1972, representatives from the industrialized world met with environmental problems weighing heavily on their minds.

In his quest for higher standards of living, man has become a leading cause of environmental degradation. Mankind is just beginning to realise that unplanned activities such as technological and agricultural expansion, building of roads, dams and industries often result in the depletion of natural resources, desertification and overcrowding in cities. Most of these environmental problems result from lack of knowledge and information which would assist in predicting the impact.

Here in Kenya, it is important that in order to protect and conserve the environment, every citizen must have

a good understanding of his environment because if public awareness is translated into effective action, the deterioration of the environment can be halted. This point is emphasized by the following quotation from Unep's Annual Review (1976). "Man does not deliberately damage his own environment any more than a rational person would purposely destroy his own house. But when man takes action to satisfy his needs - when he grows his own food, rears cattle, builds roads, establishes industries - his activities involve side effects which are environmental. These side effects may make it difficult or even impossible for man to sustain his original activities" (Unep, 1976: p. 6).

Kenya is presently facing a number of environmental problems which require remedial measures. Actions to remedy these problems are possible only if the initial causes are known. This will be like treating the disease instead of the symptoms.

1.1 Statement of the Problem

Environmental issues are no longer myths. They are real current problems facing many countries the world over. The ability to arrest environmental degradation will solely depend on the consciousness or awareness of the people whose actions directly impinge on the environment. In Kenya the role of formal education cannot be over-emphasized in this respect. Hence the need to have teachers who are well informed in matters

affecting environmental degradation. The study, therefore, seeks to answer the questions: Are primary school teachers in Amukura division of Kenya aware of environmental problems? If so, to what extent are they aware to the prevailing environmental problems in Kenya?

1.2 Hypotheses

- (a) Majority of primary school teachers in Amukura division of Busia district are aware of the major environmental problems in Kenya both at national and local level.
- (b) Majority of primary school teachers in Amukura division of Busia district are aware of the causes of and remedies to environmental problems in Kenya.

1.3 Purpose of the Study

Environmental degradation is a current problem in this country. In an effort to conserve and protect her environment, the Kenya Government has instituted a number of measures. Educational campaigns through the mass media have been one measure adopted. In the formal education sector, the teacher's role has been recognized. To be able to fight environmental degradation, it is important that teachers who play a pivotal role in the education sector, should be made aware of the existing environmental

problems in the country. They should also be aware of the causes of these problems if solutions to solve them have to be sought.

Like the rest of the country, Amukura division has seen a lot of rain-water go to waste, top rich soil washed away during heavy downpours and grazing land diminish. There are a number of factors that have contributed to this state of affairs. These have included population growth, cultivation on hilly locations and sheer neglect of conservation measures.

This study is, therefore, an attempt to create an awareness on the part of the primary school teachers in the division to these pressing environmental problems. The causes have to be identified and possible solutions found to arrest the problems.

1.4 Significance of the Study

Although the Kenya Government has made tremendous efforts in disseminating environmental conservation messages through the mass media, much remains to be done. Success can be achieved through both the formal and non-formal methods. The government places much emphasis on the formal education sector. That is why it spends up to 40% of its national budget on education alone. This goes to show the great attachment Kenyans have towards education. It is the most important inheritance a parent can give to his

child. Since children are the future leaders, this is all the more reason why they should be well prepared for the task of nation-building. This is where the teacher's role becomes extremely crucial. Since the teacher is with the child most of the time he can shape his thinking by moulding him into a useful future citizen. A correspondent in the "Sunday Nation" had this to say about this important role. "The children of the earth are the hope of the future, so they must be brought up to really understand love and have reverence for mother earth, their true mother" (Sunday Nation, Dec. 2, 1990, p. 17). The teachers can thus successfully perform this duty if they themselves are well informed and are aware of the environmental issues at hand.

The teacher's role in the community in which they live is also an important one. He is supposed to be a mirror upon which society can learn from. His influence can thus be a factor to decide on the community's attitude towards environmental conservation and management. Through active participation on environmental conservation and management, the local community can emulate the teacher's example. It will be one way of spreading the conservation message.

It is with this in mind that teachers in Amukura division are expected to respond to current environmental problems in the area. Once they have identified the

problems in the area, measures should be instituted to prevent further environmental degradation. Tree-planting, gabion-building and construction of terraces could be some of the measures taken to prevent soil erosion for example.

Also positive attitudes towards environmental preservation should be developed. Through practical examples, the local community should be able to appreciate the need for proper environmental management. This study aims to achieve just that.

1.5 Basic Assumptions of the Study

It has been assumed by the researcher that:

- (a) the information given by the respondents is correct.
- (b) the respondents did not influence each other in answering the items on the questionnaire.
- (c) the items on the questionnaire were understood by all.
- (d) the age and sex of the respondent did not have an effect on the responses given.

1.6 Limitations of the Study

The M.Ed. (PTE) programme is structured in such a way that much time is devoted to class-room work leaving little time for the research project. Three months is,

therefore, a very short time to undertake comprehensive research work.

Environmental problems discussed in this project are those that hinge around the pollution of the physical environment and depletion of resources. Others are those that affect the ecological, economic and social environment. However, there is one aspect of the environment that is not discussed in this project and that is aesthetic environment. It is an important aspect of environmental conservation as aptly put by His Highness, The Aga Khan. He said, "people all around the world are becoming increasingly alarmed about the deterioration of the natural environment. In this setting of anxiety, two principles are essential. First, scientific knowledge and ecological expertise are vital if people are to understand what to do. But secondly, and equally important, are the moral and ethical aspects - the religious dimensions - which help people understand why they should care for nature." (The Weekly Review, April 27, 1990 p. 22).

1.7 Area of Study

Amukura division is a newly created administrative area carved out of the former large Amagoro division. The division lies on the northern part of Busia district.

Administratively, the division has two locations - Teso West and South Teso. Teso West and South Teso.

The area is thickly populated with the people living in family units of man, his wife/wives and an average of five children. Polygamy is common and the average land-holding per family is three to four hectares. However, because of population pressure, the land-holdings are getting smaller each time because of sub-division.

The people living in the division are peasant farmers. Main subsistence crops are maize, beans sorghum, millet and cassava. A variety of livestock species including indigenous cattle, sheep, goats and chicken are kept. The number of exotic cattle and chickens is negligible mostly because of disease problems.

The area under study (269sq. km) comprises one-third of hilly landscape, another one-third of swamp and the remaining one-third flat land. Because of the increasing population, pressure has been exerted on the land, forcing cultivation to extend to hilly locations. Here trees have been cut to give way for cultivation. This has resulted in serious soil erosion. The swampy areas have not been properly drained. As a result water-clogging becomes a problem during the rainy season. Pressure has also been exerted on the land as a result of increased animal populations (cattle, sheep, goats and recently, pigs). The increased number has reduced the amount of pasture available for grazing.

Economically, Amukura division, like the rest of Busia district, is poor as evidenced by the figures shown in Table One below.

Table 1

Comparative Economic Figures in Kenya

Earnings	For Kenya	For Busia
Wage Earnings	£788,681,000	£3,499,800
Annual per capita Income	Shs.1,900 p.a.	Shs.520 p.a.
Poverty line	Shs.2,000 p.a.	75% Below

If the present trend of land degradation continues, then the problem of poverty will increase. There is, therefore, an urgent need for the people of the area to be made aware of the importance of managing their environment properly.

1.8 Definition of Terms

The terms used in this study are defined below.

- (a) Awareness - The state of being conscious about the existing environmental problems.
- (b) Environmental Problems - These are the problems encountered in the environment as specified below: soil erosion, flooding, urbanization, wildlife conserva-

tion, industrial pollution and poor agricultural practices.

These are the major problems in Kenya discussed in this project paper.

(c) Majority - In the data analyses, this will refer to percentage figures from fifty (50) and above.

1.9 Organization of the Study

The remaining part of the study has been arranged in the following pattern: Chapter Two will be a Review of Related Literature whereas the Design of the study will comprise Chapter Four. Data Analyses takes care of Chapter Five. The last chapter (Chapter Six) will be summary of the findings, Recommendations and Suggestions for further study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

Much has been written on environmental problems. The aim has been to highlight these problems so that people become aware of them. Leading the crusade has been Unep. Since its inception in 1972, the United Nations Environment Programme (Unep) has strived to live up to its mandate. For instance, on environmental awareness, Unep encourages the inclusion of environmental issues in education. The joint Unep/Unesco International Programme in Environmental Education, launched in 1976, includes the training of teachers, publications and technical assistance to governments. Unep also provides environmental training components for use in ILO management programmes and supports regional networks of environmental training institutions. Besides, Unep provides information through its publications and press releases.

Here in Kenya the government followed up the Stockholm Conference by establishing a number of bodies with specific roles with regard to environmental issues. The National Environmental Secretariat (NES) was established in 1974 initially in the office of the President. During the re-organization of government in 1979, the Secretariat was moved to the newly created Ministry of Environment & Natural Resources.

and Natural Resources. The Secretariat is mandated with technical matters related to the resolution of environmental and human settlement issues. The secretariat is structured into eight divisions and one of these is the Environmental Education and Information division. Some of the functions of this division include the planning and developing environmental education programmes as well as assisting the Director on the establishment and servicing of the National Research Centre for materials on Environmental Education.

In January, 1981, His Excellency the President, announced the establishment of the Permanent Presidential Commission on Soil and Water Conservation and Afforestation. Broadly, this commission was to review all programmes pertaining to soil, water, afforestation and flood control.

The establishment of these two bodies just goes to show the seriousness with which the government viewed environmental problems in the country.

Why then conserve the environment? Issues related to water and soil conservation are closely inter-related. Desertification and deforestation will inevitably lead to loss of soil and water on land. First, the aim of conserving the environment is to reduce soil erosion. Lack of this can lead to sediment pollution. Sediment pollution can be a nuisance to irrigation schemes through blocking and reduction of water flows. Sediment loads can also accelerate the tear and wear of pipes and sprinklers.

Soil should also be protected to reduce chemical pollution. Since top soil contains nutrients on which plants thrive, it should be protected at all costs.

Secondly, the environment should be preserved to protect forests and other vegetative cover. Trees are needed for domestic use (fuel, building materials), industrial demand (paper industry) and trees also help in the protection of soil and water catchment areas. Trees reduce the amount of silting in dams.

Thirdly, water conservation is important for crop production, H.E.P. production, aquatic and ecological balances and for domestic use.

With these purposes in mind the Permanent Presidential Commission on soil and water Conservation and Afforestation has been working tirelessly throughout the country to meet the challenges facing the country's environment.

The literature reviewed include: publications by NES, Unep, ecology books dealing with environmental conservation and management and the Kenya Government policy papers on environment.

2.1 The Global Context

Concern for the preservation of the environment can be said to have gained momentum with the establishment of Unep in 1972 at the Stockholm Conference. However, as early as the 3rd century B.C., the Chinese are reported to have shown concern for their environment. Tivy (1981) reports, "There is evidence that as early as the third century B.C. in China, population growth and resource use had resulted in widespread deforestation and severe erosion in upland and mountain areas. Sources record the existence of official forests and watershed conservators whose responsibility was to regulate timber extraction and ensure the maintenance of the last remaining strands of mountain forests respectively" (Human Impact on the Ecosystem, 1981, p. 190).

With increase in human populations, it became increasingly clear that if environmental issues had to be adequately tackled, there was need for more information regarding environmental problems. This would be the only sure way of combating them. A data bank was necessary. Mathews emphasises this context when he says, "As concern for environmental quality increases, there is an awareness growing among planners, decision-makers, and the public that more accurate and objective information on the status and trends of the environment is necessary to improve the formulation, implementation

and communication of environmental policy."

(Resource Materials for Environmental Management and Education, 1976, p. 164).

Concern for environment has, therefore, become a global issue. In its broadest sense, conservation is now concerned not just with the protection of discrete phenomena, but with maintaining and, if possible, enhancing the whole biosphere.

2.2 The Kenyan Context

In Kenya, awareness of the seriousness of environmental conservation began with the establishment of NES and the Permanent Presidential Commission on Soil and Water conservation and afforestation in 1974 and 1981 respectively. The issue became critical because the environment was closely linked with development.

Immediately after Kenya's independence in 1963, many changes began taking place. Resettlement programmes for the landless were started, provision for free health services were embarked on and the Harambee spirit suddenly saw an upsurge in the number of pupils going to school. All these developments had their impact on the environment. More settlement schemes meant more land had to be opened up for cultivation. Better medical facilities resulted in reduced mortality rates. This meant an increase in population. The increasing number

of people required more land for settlement, more food and virtually more of everything. Thus the educational system had to be geared to meet these challenges if the environment had to be conserved. As early as June 1966, the late Founding Father of the Nation, Mzee Jomo Kenyatta had this to say, "It has long been my opinion that over the world as a whole, techniques of education have been too formal and too static. Certainly in this Republic, we must move with the future, ensuring that the system and substance of education can best equip our young people for careers and contribution directly linked to development needs", (Strategies for Environmental Education, 1978, p. 6).

In short, what Mzee was emphasizing was development without destructions.

By 1988, more efforts had been made at conservation as evidenced by a statement made by Zephania Anyieni, the Chairman of the Permanent Presidential Commission on soil and Water Conservation and Afforestation. He declared that the Commission had aroused widespread awareness of the importance of environmental conservation. It had also been able to restore any form of land degradation. Clearly the efforts of the Commission were beginning to pay dividends.

Other than the establishment of the two bodies the government has made sure that Kenyans are constantly

reminded of the importance of the environment by devoting special days in the year to environmental issues. There is the annual National Tree-Planting day and the World Environment Day which are observed each year in recognition of the importance of proper environmental management.

In the campaign on environmental conservation, there is no person other than the Head of State, His Excellency, President Daniel Arap Moi, who deserves greatest credit. Since he assumed the highest office in the land, he has tirelessly worked, encouraging Kenyans to preserve their environment for future generations. His actions on the environment have won him wide acclaim both here and in other parts of the world. For instance on the 4th of June, 1989, His Excellency was given an award by Unep for his outstanding contribution to environmental conservation in the country. During the presentation of the award the Executive Director of Unep, Dr. Mostafa Tolba, said this of the President, "For more than a decade, President Moi has exercised strong leadership in Kenyan and African environmental issues, particularly in the fields of soil preservation, reforestation, national parks and sustainable rural development. He is also a leading advocate of international co-operation to preserve the ozone layer and for measures to limit change." (The Kenya Times, 1988, p. 24).

On several occasions in his public addresses, the President has reminded Kenyans of the need to have a clear

understanding of the environment. His love for wild-life was demonstrated when on the 18th of July 1989, he set on fire ivory worth Shs. 60 million. On that occasion he declared, "The ivory which is worth shs.60 million will go up in smoke in this animal sanctuary to signify our commitment of the cause of wildlife conservation both within and outside our borders. In fact, and in a wider sense, we abhor any activity that would destabilize the ecosystem of the world" (The Standard, 1989, p. 12).

From the educational point of view, no efforts have been spared to include environmental education in the school curriculum. In 1988, the Report of the Presidential Working Party on Education and Manpower Training for the Next-Decade and Beyond (Kamunge Report) realised the contribution of the environment to national development and the role of education and training in its preservation and enhancement. It recommended that:

- (a) environmental education or studies be made part and parcel of the education and training curricula and be taught at all levels of the education system.
- (b) concerted efforts be made to educate members of the public on methods of, and their specific role in the conservation and the enhancement of the environment. (Kamunge Report, 1988 p. 4).

Although these recommendations have not been fully implemented, a start has been made in a number of educational institutions. The Kenya Science Teachers College in Nairobi has a course on environmental science. Earlier on (1986), the President had suggested the introduction of environmental education in Moi University. At the time, he had urged Kenyans to realise the importance of the environment. He noted that the environment influenced the climate and hence the need to protect it at all costs. Moi University is currently offering a post-graduate programme in environmental science.

Kenyatta University is another institution of higher learning that has been a beneficiary from the government's efforts to expand environmental education. During the sixth graduation ceremony held at the college in August, 1990, the President ordered for the establishment of a Faculty of Environmental Education. On that occasion, he reminded Kenyans that the protection of the environment called for a collective responsibility and challenged University researchers to address themselves to the issue of waste matter and other environmental pollutants. He added, "It is incumbent upon us to protect the water catchment areas, to prevent air pollution and to preserve the wildlife for the benefit of this country". (Kenyatta University News, 1990, p. 2).

Other environmental problems discussed in this project have been given due attention by the government.

This is clearly illustrated in Kenya's Report to Unep of 1972. In all, the aim has been to create an awareness on the public in general and teachers in particular. Teachers play an important role in the education of the country's children. Hence their contribution in the area of environmental conservation is of great significance.

In the next chapters the researcher intends to find out how knowledgeable primary school teachers in Amukura division, are about environmental problems in Kenya. This is in recognition that the process of development must indeed take place if poverty, the worst of all environmental ills, is to be eradicated. But it must be equally recognized that the environment is the "goose" that lays the "golden egg" of development and that if the development process is to be sustainable in the long run, it must take place without undermining the environmental base upon which it depends. If mankind is to be the master of his destiny, then he must among other things conserve and protect the environment and also manage it in such a way that it benefits not only himself, but also his children and the children's children.

CHAPTER THREE

DESIGN OF THE STUDY

3.1 Introduction

Amukura division is divided into two educational zones - Teso West and South Teso. These two educational zones correspond with the administrative boundaries of the division. There are a total of forty primary schools in the division with an average of ten teachers per school. This brings to a total of four hundred primary school teachers in the division.

3.2 Sample description Size and Selection

The sample for the project consisted of primary school teachers. The sex, age or professional qualifications of the teachers did not affect the sample selection.

A total of thirty teachers were selected for purposes of administering the questionnaire. These teachers were from six schools - three from each of the two educational zones - Teso West and South Teso. There were a total of ten female and twenty male teachers.

The schools were selected on the basis of their geographical locations. Two of the schools were from

hilly locations, the next two are located in swampy areas and the remaining two are schools from flat locations.

3.3 Instrument Description and Administration

The instrument used for this research project was a questionnaire (see Appendix A). It consisted of a total of thirty items. For each problem discussed in this project, five items were constructed. The theme throughout the construction of the items was similar: existence of the problem at national level (1st item), the causes of the problem (2nd and 3rd items), the existence of the problem at local level in the case of soil erosion and flooding or the respondents attitudes to the problem in the case of urbanization, wildlife conservation, industrial pollution and poor agricultural practices (4th item). The last item required the respondent to provide possible solutions to prevent the problems mentioned above.

In administering the questionnaire, the researcher visited the schools after getting permission from the area Education Officer. The researcher then approached the respective heads of schools and explained the purpose of the study. Questions that needed clarification were discussed together with the researcher. In order to avoid disrupting the teachers' normal routine, a week was given to each teacher in which to complete the

questionnaire. Completed questionnaires were handed over to the headteachers from whom the researcher collected them. Of the total thirty questionnaires given out, only five were never returned.

3.4 Summary

In the next chapter the researcher is going to state the responses given by the teachers in respect to each environmental problem that had been posed in the questionnaire. Percentage figures have been tabulated in the level of awareness/unawareness or the attitudes (both positive and negative) with regard to environmental problems discussed in the project.

CHAPTER FOUR

DATA ANALYSES

4.0 Introduction

Data obtained from the questionnaires were analysed on the basis of the problems that had been raised. This consisted of the awareness of the existence of the environmental problem at national and local level, the causes and possible solutions to the problem.

4.1 Soil Erosion

Questions on this problem were as follows:

- (a) Is soil erosion an environmental problem in this country?
- (b) Should people be allowed to cultivate on hilly locations?
- (c) Should forest lands be cleared to create more human settlement?
- (d) Do you come from an area that suffers from soil erosion?
- (e) If the answer in (d) above is in the affirmative, what measures can you take to prevent soil erosion in your locality?

The responses obtained are shown in Table II below:

Table II

Responses relating to Soil Erosion as a Problem

	Aware	Not aware
Existence at a National Level	100.0%	0.0%
Causes	68.0%	32.0%
Existence at local level	72.0%	28.0%
Solutions	72.0%	28.0%

From the figures in the above table, all teachers questioned were aware of the existence of the problem at national level. At local level the figure was down. This would be expected as not all teachers come from hilly locations where soil erosion is common as a result of overuse of the land or because cultivation has been extended to hilly locations.

For teachers whose areas suffer from soil erosion, the following solutions were provided.

- Building of terraces especially on hilly areas to prevent soil from being washed away,
- planting of trees was highly recommended as this would keep the top soil together.

- livestock should also be reduced to avoid overgrazing which inevitably leads to soil erosion.
- contour ploughing was suggested.
- the building of gabions would also reduce soil erosion.
- building cut-off drains was another common solution suggested.

4.2 Flooding

As in the previous case, questions on flooding followed the same pattern.

- (a) Does Kenya suffer from flooding during rainy seasons?
- (b) Do you encourage the felling of trees for fuel wood?
- (c) Should farmers be allowed to cultivate along ^{river} river-banks?
- (d) Does your area suffer from flooding during the rainy season?
- (e) If your answer in (d) above is in the affirmative, what measures can you take to control this flooding?

Results of the responses on this problem are shown in Table III below:

Table III

Responses Relating to Flooding as a Problem

	Aware	Not Aware
Existence at National level	88.0%	12.0%
Causes	84.0%	16.0%
Existence at Location level	28.0%	72.0%
Solutions	24.0%	76.0%

Flooding seems not to be a major problem in Amukura division as shown by the figures in the table. Although Busia district suffers from flooding during the rainy season, this happens to be on the lower parts of the district - mainly in Bunyala division near Lake Victoria. However, it is rather surprising that quite a number of teachers are not aware of the existence of this problem at national level. Floods frequently occur in Ahero in Kisumu district as well as in Tana River district.

Those who responded positively to the existence of the problem at local level must be coming from lower (swampy) areas of the division where water logging is

usually a problem during the rainy seasons.

Because of the relatively small magnitude of the problem within the division, there were not many solutions provided by those who come from flood-prone locations. Some of the solutions given were as follows:

- plant water absorbing trees such as eucalyptus.
- construct artificial banks especially in lower areas of rivers that are prone to flooding during the rainy season.
- other solutions included crop rotation and land reclamation.

4.3 Urbanisation

Although this is a recent problem in the country, it is now causing a lot of concern to planners as the influx of rural people moving to urban areas attains a dangerous phenomenon. Respondents were required to show whether this is becoming a national problem or not. Instead of the existence of the problem at local level, the respondents were asked about their attitudes to the problem. The same pattern is followed for the remaining problems as shown by the questions that follow for each problem. For urbanization, the following questions were asked:

- (a) Is urbanization a problem in this country? problem

- (b) Should all unemployed persons move to town?
- (c) Should physical and social amenities be provided to rural population?
- (d) Do you prefer working in an urban area?
- (e) If you were a policy maker in this country, what measures would you take to curb the urbanization process?

The responses to these questions are shown in Table IV below.

Table IV

Responses Relating to Urbanization as a Problem

	Aware	Not Aware	Positive	Negative
Existence at National level	80.0%	20.0%		
Causes	86.0%	14.0%		
Attitude toward problem			14.0%	84.0%
Solutions	96.0%	04.0%		

80% of the teachers were aware that the problem of urbanization, exists in Kenya. Similarly almost a similar number (86%) know of the causes related to this problem. As regards the individual attitude, not many were willing

to work in urban areas as reflected by the high percentage. Solutions offered to solve the problem were quite many as is indicated below:

- Respondents were of the opinion that more industries should be located in rural areas to ease the congestion in urban areas.
- Social and other amenities should equally be provided to rural populations. This will at least reduce the pull-causes of urban migration.
- With regard to agriculture, some respondents suggested improved farming techniques to boost rural incomes. Low incomes in rural areas is usually one of the major causes of the rural-urban migration.
- The education system should also emphasize blue collar jobs since white-collar jobs are becoming scarce with the increasing number of school-leavers.

4.4 Wildlife Conservation

This is yet another problem that is still new to many teachers. The division does not have any national park or bird sanctuary. The wildlife in the division are viewed as enemies of the people since they destroy the farmers' crops. The common animals found here are

monkeys and baboons. Responses to questions related to this problem attest to this. Respondents were asked to give answers to the following questions:

- (a) Is Kenya's wildlife an endangered species?
- (b) Do you think the government should lift the ban on the sale of ivory?
- (c) Should the government encourage settlement on marginal lands near National Parks or Game reserves?
- (d) Do you think the Ministry of Tourism and Wildlife should be abolished?
- (e) If you were the Director of Wildlife Services in this country, what measures would you institute to curb wildlife destruction?

Responses to the above questions are shown in Table V below.

Table VResponses Relating to Wildlife Conservation as a Problem

	Aware	Not Aware	Positive	Negative
Existence at National Level	76.0%	24.0%		
Causes	60.0%	40.0%		
Attitude Toward Problem			92.0%	8.0%
Solutions	88.0	12.0%		

Many of the subjects were aware of the existence of the problem as reflected in the percentage figure. Surprisingly, the number responding to the causes was lower than those who were aware of the existence of the problem.

With regard to attitudes towards conservation 92.0% were in favour of wildlife conservation as a National Reserve. The number giving possible solution to the problem was also quite high. The following were some of the solutions suggested to combat wildlife destruction:

- poachers should be jailed or outrightly killed on sight.
- More personnel should be provided to bolster the anti-poaching campaign.

- With increased personnel, intensified patrols should be conducted in the National Parks to flush out the poachers.
- There should also be a total ban on the sale of animal trophies. This measure will enable the government to close the loop-holes in the illicit trade.
- Others suggested the banning of hunting. This measure is still in force.
- A suggestion was also made regarding the fencing of National Parks. This should be done using electric fences.

4.5 Industrial Pollution

Industrial pollution as an environmental problem was not considered high as reflected by the figures in Table VI below. Responses to questions relating to this problem were mixed. There were those who considered industrial pollution was a national problem whereas others thought it was not. Respondents were divided on this particular issue. Questions asked were as follows:

- (a) Do you think Kenya is an industrialised country?
- (b) Does Kenya suffer from air pollution?
- (c) Is noise a pollutant?

(d) In your opinion which is the most dangerous pollutant resulting from industrialization?

(e) If you were the Director of Industry how would you go about reducing industrial pollution in this country?

Below are the figures representing the respondents answers to the above questions.

Table VI

Responses Relating to Industrial Pollution as a problem

	Aware	Not aware	Positive	Negative
Existence at National level	56.0%	44.0%		
Causes	82.0%	18.0		
Attitude to problems	-	-	64.0%	36.0%
Solutions	52.0%	48.0%		

From the above figures, it is clear that quite a number of respondents did rate Kenya as being an industrialized country. However, those who felt Kenya is an industrialized country is slightly more (56%). As regards the causes, 82.0% were of the opinion that the most prevalent pollutant is carbon monoxide which is emitted by factories and motor vehicles.

Solutions given to combat this problem were not many. The few suggested solutions included the following:

- Enact laws regulating the various types of industrial pollution.
- There should be proper sewage disposal facilities.
- Waste products should be properly treated before disposal.
- The use of electricity should be encouraged in manufacture instead of fossil fuels which normally emit obnoxious smells.
- Finally, there should be designated points for waste disposal.

4.6 Agricultural Practices

Questions regarding this problem revolved around on the proper use of chemicals in order to increase food production. Though necessary for modern agriculture, these chemicals have side-effects which the farmer should be made aware of. The questions appear below:

- (a) Is the use of agricultural chemicals a hazard to agriculture in this country?
- (b) Should farmers be allowed to use fertilizers to increase food production?
- (c) Are pesticides good for agriculture?
- (d) Do you think there should be an authority to

to oversee the use of agricultural chemicals in this country?

- (e) If you were the Director of Agriculture what steps would you take to protect Kenyan farmers from chemical poisoning?

Responses in percentage form are shown in Table VII below:

Table VII

Responses Relating to Agricultural Practices as a Problem

	Aware	Not Aware	Postive	Negative
Existence as National Problem	54.0%	46.0%		
Causes	82.0%	18.0%		
Attitude Toward Problem			92.0%	8.0%
Solutions	96.0%	4.0%		

From the above table, there were again mixed reactions on the use of chemicals for agriculture. 54% of the respondents felt that agricultural chemicals were a hazard whereas 46.0% said it was not.

As for the causes - the use of fertilizers and pesticides on the farms - the majority were of the opinion that though, these chemicals were needed for increased

food production, they were also dangerous if not properly used.

On the establishment of an authority to oversee the proper use of chemicals to be used on the farms, the majority felt that there should be one.

As for suggestions for possible solutions to the use of chemicals, 96.0% of the respondents gave solutions which could assist farmers on the proper use of these chemicals. Some of the suggestions given were as follows:

- Agricultural chemicals should be tested before given to farmers for use.
- As far as possible farmers should be encouraged to use natural manure.
- Education should also be intensified. This should involve extension officers instructing farmers on the proper use of chemicals.
- Seminars and demonstrations during field days should be held on regular basis. This will enable the farmers to keep abreast of the developments in new chemicals for agriculture.
- Where a farmer is literate, they should be encouraged to read instructions on the use of chemicals.
- Finally, protective clothing should be used where chemicals are extremely hazardous.

4.7 Summary

The above responses clearly show that the majority of teachers in Amukura division are aware of the existence of environmental problems both at national and local levels. The figures also confirm that the teachers are aware of the causes of and possible solutions to combat these environmental problems.

CHAPTER FIVE

SUMMARY

This research was conducted in a rural setting. As a result, questions to problems which are rural-based were well responded to as compared to problems that are unique to urban areas. Issues regarding soil erosion were handled without much difficulty. This is probably because the teachers have had these experiences as most of them are also small-scale farmers. In addition the area under study suffers a great deal from soil erosion as trees have been cut and cultivation has been extended to hilly locations due to population pressure on the available land.

The problem of flooding is not a very serious one in Amukura division. If there is any serious flooding at all, this occurs on the lower parts of the division. As a result responses as to the existence of the problem locally reflects the kind of situation found in the area. Save for a few areas in the District, such as Bunyala, flooding is not a serious problem in Amukura division. In discussing the possible solutions, not many were cited. This is probably because the teachers have not been confronted with this problem.

On urbanization, this is again another area where the teachers were quite informed. This is not surprising

as some of these issues are discussed in other school subjects such as G.H.C. However, one interesting aspect of this problem is that the teachers were very much opposed to working within an urban environment. 84% were not in favour of the idea. This is a sign that they are aware of the magnitude of the problem and would thus keep away from urban centres.

Many of the suggested solutions centred around the improvement of facilities in the rural areas. These included the provision of infrastructure such as roads, and clean water as well as providing social amenities such as recreational centres, schools, health facilities. These are often lacking in rural areas thus prompting the rural-urban migration. Improvement of rural areas would generally involve the uplifting of the standards of living of the rural people. More industries should be established in rural areas. Also improved techniques of agriculture to boost rural incomes should be encouraged.

Wildlife conservation is another area where most teachers seemed knowledgeable. As a national problem, they were quite informed of its magnitude. Most of them were in favour of the continued ban on the sale of ivory to save the elephant from extinction. In this respect, therefore, the Ministry of Tourism and Wildlife has an important role to play.

Air pollution is not yet a problem in the rural areas. Despite this, the teachers to whom the questionnaire was administered agreed that air pollution is becoming a worrying problem in urban areas. Motor vehicles and factories discharging effluents into rivers were the main culprits. Some teachers agreed that noise is now becoming a pollutant of great concern. This is more so in the urban areas.

Finally the use of chemicals in agriculture received mixed reactions. Some teachers felt that fertilizers herbicides and pesticides were not such a threat to Kenya's agriculture. Similarly, the majority also felt that there should be an authority to oversee the use of these chemicals to protect the farmer from side effects. This is reflected in the number of solutions that were put forward to combat this.

5.0 Recommendations

Although the Kenya Government has spearheaded a campaign to conserve and protect the environment, much remains to be done. The establishment of such bodies as the Presidential Commission on Afforestation and Soil Conservation and the National Environment Secretariat testifies to the Government's commitment to environmental protection and conservation. Should Kenyans remain complacent despite these measures? The answer is clearly no. The onus of environmental protection lies on every

Kenyan. During the just ended Environment 2000 Conference on Kenya's State of the Environment, the Editor of the "Daily Nation" had this to say, "The apathetic response from "Wananchi" and leaders to environment - related messages suggests, almost conclusively, that either the urgency of those messages has not registered, that the messages are incompetently packaged and transmitted, or that the target audience finds itself trapped in a situation which frustrates any efforts or intention to positively respond to the messages. Possibly, it is a combination of all three factors. What is certain is the fact that alarm over the accelerated degradation of the environment has not sufficiently sunk in to provoke an equally intense process of environmental rehabilitation and protection" (Daily Nation, 1990, p. 6). From the above quotation, there is clearly a case for a review of policy towards environmental issues. A start has to be made. This should be at our educational institutions. For teachers to effectively disseminate the environmental message, they have to be well informed - both theoretically and practically. The position at the moment is that the response on environmental issues by teachers is relatively scanty and is theory - oriented. Admittedly, the K.I.E. has included environmental issues in science, GHC and Agriculture subjects taught at primary schools. This is not enough. The time is now ripe for the introduction of full-time courses in environmental studies at all primary teacher training colleges. Murii Hege (1986) observed

that this had not been done. He was surprised because environmental issues are now so pressing that without adequate education we are headed for disaster.

Professor Tandom Yash in his book, "Militarism and Peace Education in Africa" has advocated for seven sectors of education. Among these is environmental education. He adds, "Environmental Education involves being familiar with nature, acquiring the knowledge of the principles of its protection, of causes and consequences of pollution and how to combat it." (Tandom, 1990, p. 12). This kind of knowledge can only come about if the educational structure is made in such a way that teachers are the beneficiaries. They become effective when proper exposure has been made. This exposure leads to awareness on their part. To create more awareness of environmental problems among the primary school teachers, the curriculum has to be designed in such a way that environmental education can start right at the pre-primary level.

Environmental education should be a life-long process. One of the things environmental education should do to people is to help them view their surroundings with an appreciative but critical eye. Environmental education is ultimately about helping people to choose wisely and act considerably, whether as individuals, citizens or members of the world community - that "global village" in which we are all part of one another. It part of

is a life-long and many-sided process in which every educationist has a proper role to play.

5.2 Suggestions for Further Research

This project has been undertaken in a rural setting. There is, therefore, need to find out the awareness of environmental problems of teachers working in urban area. As earlier on pointed out, there are certain environmental problems which are unique to urban areas. These include air, water and noise pollution. The same may not be true at all in the rural areas. On the other hand, problems of soil erosion, deforestation, use of agricultural chemicals are more common in rural areas. Hence the need for further research in this area.

Also environmental problems have today become complex. When we talk of environmental issues, we refer to the total environment. This will include the Biotic, Abiotic and the socio-cultural environment. It is the last aspect of the environmental degradation that this project has not addressed itself to. Hence the need for further research in this area.

The late Prime Minister of India, Indira Gandhi aptly took up this issue when she posed the question, "How can we speak to those who live in villages and in slums about keeping the oceans, the rivers, and the air clean when their own lives are

contaminated at the source? Are not poverty and need the greatest polluters?" (Henderson, 1971, p. 1) Her sentiments were recently reinforced by Professor M.B. Darkoh, of Kenyatta University when he delivered a public lecture. He said, "there is need to review past (ASAL) development strategies which have not been successful because they attempt to radically alter peoples' way of life without properly understanding the cultural and environmental factors which condition the lives of these people. (Kenyatta University, News, 1990, p.15). Clearly there is a case to consider this aspect of the environment which has been neglected for quite sometime.

In conclusion, it is fair to say that although much has been written about environmental issues, there are areas that require further investigation with regard to peoples attitudes towards environmental conservation. This project has attempted to find out the level of awareness of environmental problems in Kenya among primary school teachers in Amukura division. To the extent that these teachers are aware of these problems more needs to be done to have this theoretical knowledge translated into concrete action. Only then can one say that issues related to environmental management and conservation are being taken seriously.

APPENDIX A

TEACHER QUESTIONNAIRE

The purpose of this study is to find out the awareness of environmental problems in Kenya.

Name of School -----

Sex (Male/Female) -----

Your sincere answer to each of the questions below will contribute towards the usefulness and success of the project at hand. Therefore, I kindly request you to fill in the information as appropriately as you can. All the information given will be treated in strict confidence.

Most of the questions require a yes/no answer while a few need to be expanded a bit. If you are not sure about an answer please say so. Tick the answer you think is correct in the case of the Yes/No questions.

Thank you in advance for your co-operation.

1. Is Soil erosion an environmental problem in this country?

Yes () No ()

2. Should people be allowed to cultivate on hilly locations?

Yes () No ()

3. Should forest lands be cleared to create room for more human settlement?

Yes () No ()

4. Do you come from an area that suffers soil erosion?

Yes () No ()

5. If the answer in (4) above is in the affirmative what measures can you take to prevent soil erosion in your locality? (be brief)

6. Does Kenya suffer from flooding during rainy seasons?

Yes () No ()

7. Do you encourage the felling of trees for wood fuel?

Yes () No ()

8. Should farmers be allowed to cultivate along river-banks?

Yes () No ()

9. Does your area suffer from flooding during rainy seasons?

Yes ()

No ()

10. If your answer in (9) above is in the affirmative, what measures can you take to control this flooding (be brief)

11. Is urbanization a problem in this country?

Yes ()

No ()

12. Should all unemployed persons move to town?

Yes ()

No ()

13. Should physical and social amenities be provided to rural populations?

Yes ()

No ()

14. Do you prefer working in an urban area?

Yes ()

No ()

15. If you were a policy maker in this country, what measures would you take to curb the urbanization process? (be brief)

16. Is Kenya's wildlife an endangered species?
Yes () No ()
17. Do you think the government should lift the ban on the sale of ivory?
Yes () No ()
18. Should the government encourage settlement on marginal lands near National parks or Game parks?
Yes () No ()
19. Do you think the Ministry of Tourism and Wildlife should be abolished?
Yes () No ()
20. If you were the Director of Wildlife Services in this country, what measures would you institute to curb wildlife destruction? (be brief)

21. Do you think Kenya is an Industrialized country?
Yes () No ()
22. Does Kenya suffer from air pollution?
Yes () No ()
23. Is noise a pollutant? Yes () No ()
24. In your opinion which is the most dangerous pollutant resulting from industrialization in this country?

(be brief) -----

25. If you were the Director of industry how would you go about reducing industrial pollution in this country? (be brief)

26. Is the use of chemicals a hazard to agricultural in this country?

Yes () No ()

27. Should farmers be allowed to use fertilizers to increase food production?

Yes () No ()

28. Are pesticides good for agriculture?

Yes () No ()

29. Do you think that there should be an authority to oversee the use of agricultural-chemicals in this country?

Yes () No ()

30. If you were the Director of agriculture, what steps would you take to protect Kenyan farmers from chemical poisoning (be brief)

BIBLIOGRAPHY

Daily Nation, Thursday, October 25, 1990, p. 6.

Henderson Paul, World Poverty, Tindling & Co. Ltd.,
Prescot, Lancashire, 1971, p. 1.

Kenyatta University News, 9th issue, October, 1990,
Nairobi, p. 2 and p. 15.

Ministry of Economic Planning and Development.
Busia District Development Plan 1983 - 1988.

Republic of Kenya, Report of the Presidential Working
Party on Education and Manpower Training for the
Next Decade and Beyond, Nairobi, 1988, p. 4.

Role and Functions of NES. A NES Publication.

Sunday Nation, December 2, 1990, p. 17.

The Kenya Times, 14th October, 1988, p. 24. 4th October, 1988

The Kenya Times, 5th June, 1989, p. 1.

The Standard, 19th July, 1989, p. 12.

The weekly Review, 27th April, 1990, p. 2.

Tiry, J. "Human Impact on the Ecosystem" Longman, New
York, 1981, p. 190.

Unep's Annual Review (1976) - Unep publication.

Yash, Tandom, "Militarism and Peace Education in Africa
Association for Literacy and Adult Education, 1990,
p. 12.