

**INVESTIGATION OF THE MEDIA USED
FOR COMMUNICATION IN
ENVIRONMENTAL EDUCATION**

**A CASE STUDY OF SELECTED PRIMARY
SCHOOLS IN NAIROBI CITY**

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THE DEGREE OF MASTER OF ARTS IN
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MANAGEMENT**

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DECLARATION

I hereby declare that this project is my original work and has not been presented for examination in any other University.

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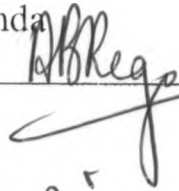


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This project has been submitted for examination with our approval as university supervisors.

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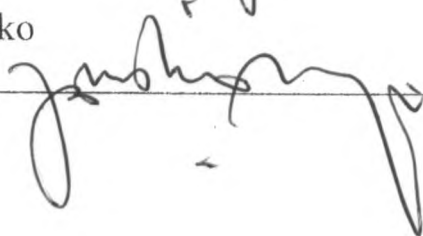


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June 20, 2003

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Date

17/06/2003

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DEDICATION

Dedicated to my wife Racheal Wanjiku and my son John Ng'ethe. Also not forgetting Joseph Ng'ethe my best friend whose life was snatched away cruelly by armed robbers on Wednesday night, December 12, 2001.

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LIST OF ACRONYMS USED

CBD	Central Business District
CBS	Central Bureau of Statistics
EE	Environmental Education
GHC	Geography, History and Civics
GOK	Government of Kenya
IUCN	World Conservation Union
KIE	Kenya Institute of Education
NGO	Non-governmental organisation
PE	Physical Education
UN	<u>United Nations</u>
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organisation
UNON	United Nations Office in Nairobi
WCK	Wildlife clubs of Kenya

(Xi)

ABSTRACT

The study is focused on media used in communicating environmental education in primary schools in Nairobi City. Environmental Education (EE) is infused formally in the primary level of the Kenyan 8-4-4 System of education. Thus, there is no subject in the curriculum called 'environmental education' at that level but various environmental topics, that are infused in the subjects such as Science, Geography, History and Civics (GHC) among others.

In accordance with Agenda 21, and other major UN documents environmental education aims at developing positive skills and behaviours, that are environmentally friendly. As such, it is not just a subject. It is aimed at one's life's behaviour and actions. It is of great importance, therefore, for one to study the media resources that are currently being utilized, at all levels of education. Use of wrong or inefficient media may lead to ineffective communication and hence poor imparting of environmental knowledge necessary for action or change of behavior from environmentally unfriendly to environmentally friendly lifestyles.

The study was done in Nairobi City. Questionnaires were used to obtain primary data from pupils and their teachers. The study centered on three objectives namely, most common media, most effective media and factors that affect choice and access to the media used (or not used) in communicating environmental knowledge.

The study findings showed that the most common media used in gaining EE information by pupils was at variance with what the teachers considered most effective. On the other hand, it was found that pupils may have access to information from other media sources, which may not necessarily be found at school. Also it was found that teachers use textbooks and posters most commonly in imparting environmental knowledge while pupils' most common aid is their teachers and newspapers.

This study also found out that teachers consider textbooks to be most effective media whereas pupils consider trips to be better and encourage them to undertake positive environmental actions. To test the relationship between the pupils and teachers' responses on the most effective media

correlation coefficient was used. The result shows a very low and negative relationship.

The study suggests recommendations to teachers, curriculum developers, Ministry of Education, mass media and policy makers in general about media used in imparting environmental knowledge and the need of harmonizing EE taught in class with outdoor experiences.

Ultimately, the media selected should be able to enhance the cardinal requirements of resource sustainability.

Summary of chapters

This study consists of 5 chapters. Chapter 1 consists of introduction, background to the study, statement of the problem, objectives, literature review, theoretical and conceptual framework, justification of the study, scope and limitation, and definition of concepts.

Chapter 2 comprises background to the study area, that is basically the physical, human and educational characteristics of Nairobi City. This section also includes some basic information on environmental agencies in the area.

Chapter 3 is on the data collection and analysis methods whereas Chapter 4 outlines the research findings and analysis. Chapter 5 states the conclusions and a summary of recommendations for future research. This section is followed by the study's bibliography.

The appendix contains a list of personnel interviewed, the questionnaires used and some official documents used in the study.

Chapter 1

1.1 Introduction

Communication in today's world is a feature in almost every aspect of life. Communication can be defined in various ways. The World Conservation Union defines communication as a two way process of information exchange with a particular aim, (IUCN, 1997) For communication to occur, some kind of media is almost inevitable. Media, simply means a device, a channel or a situation which is deliberately used in communicating messages (Fiske, 1990). It can be said that we learn almost everything through some media of communication (Kalsi, 1973). This also applies to communication in Environmental Education (EE) both formally and informally in schools.

1.2 Background

Environmental Education has gained increased attention in the world in general as one of the processes towards solving environmental problems and enhancing sustainability. Since the United Nations Conference on the Human Environment in Stockholm (1972), a series of conferences on Environmental Education have not only reiterated the need for Environmental Education but also the role of media in contributing to the success of EE through communication. Radio, television, the press as well as modern information technologies, have been recommended, among other medium of communication (UNESCO, 1980).

In developing countries, Kenya included, that are still experiencing the problems of poverty, the media used in schools has been affected by lack of adequate resources as the Government continuously 'rolls-back' its role in financing education. It is important to note that the National Environment Action Plan of 1994 recognised that there is lack of materials and personnel in teaching of Environmental Education in schools (GOK, 1994). Parents too have been caught in the never ending vicious cycle of fighting poverty such that most of them cannot afford to equip schools and thus provide

children with modern electronic media such as computers, television and video among others that are essential in learning. Also, to most parents and schools, funding childrens' visits to areas of environmental interest (for instance national parks) as often as is necessary is not possible. Thus the only remaining option is the use of media that is within the means of these institutions and individuals.

However, the media of communication in any discipline need not be expensive. Some media may be very effective yet involve little funding and creativity. The important issue is that the communicator should understand various issues pertaining to the type of media, and the target group so that he can manipulate various situations to his/her advantage in communicating the message required in Environmental Education. It is therefore important to assess the types of media and their efficiency in our schools particularly at the primary school level. Nairobi, the largest capital city in Kenya has more than 191 public primary schools as well as many private ones. These schools are in different localities facing different environmental challenges. This study attempts to study the dynamics in the media used in EE in those schools.

1.3 STATEMENT OF THE RESEARCH PROBLEM

Nairobi has experienced fast growth not only in total population but also in the primary school-going children since independence (Masaviru, 1981). This has led to problems in provision of reading materials in primary education in general. Mwangi (1987) for example states that "lack of enough reading materials and equipment affects the effective application of the school curriculum which is a constraint to effective teaching" This situation as reported in the late 1980's and persisted in the 1990's has made the introduction of environmental education difficult.

Environmental Education is formally infused in the primary school syllabus in subjects such as GHC (Geography, History and Civics) and Sciences among others. This means that EE is not a subject on its own but is in topics such as pollution, forest resources among others. Also informal EE is infused in most primary schools through membership of Wildlife Clubs that play a vital role in disseminating environmental awareness. It is important to find out the media used both formally and informally or and their efficacy in

promoting environmental actions and finding solutions to environmental problems, for this is the essence of Environmental Education in Kenya or anywhere else in the world. (Mata, 2000).

Since the creation of the United Nations Environment Programme (UNEP) in 1972, there has been an information boom in texts of environmental education all aimed at creation of awareness for institutions of learning including primary schools. Generally, for countries like Kenya experiencing many socio-economic hardships, the media of communication of environmental information either formally or in-formally has been hampered by many factors such as inadequate capacity to develop and carry out programmes for dissemination of information by utilising mass media. (Republic of Kenya 1999).

An enquiry at Kenya Institute of Education's (KIE) Educational media centre reveals a very limited choice of options available for teaching of EE concepts in schools despite the government's commitment to develop 'programs' and 'strategies' that use radio, television, songs and plays and others to disseminate information. (Omwoyo, 2002).

In 1994 the National Environment Action Program of Kenya cited shortage of funding, lack of basic teaching and learning facilities, resources (such as textbooks, audio-visual materials among others) as a major hindrance to success of incorporation of Environmental Education into school curricular. This situation is aggravated by lack of trained teachers as well as trained EE school inspectors at all levels.

The problem of low level of environmental activities by primary school pupils could be solved by use of simple but highly effective and cost-effective media. Such efforts would involve use of hitherto under-utilised media. A good example is the use of environmental games. This is a concept that would not only promote enjoyment in learning but also can be systematically organised to involve parents and the local communities as well as inculcating badly needed linkages between the corporate world with the environmental activities in schools. Mata (2000) notes that private businesses that thrive on good relations with the public and the media are eager to finance environmental contests as well as award journalists who excel in environmental themes. Studies have also shown that environmental activities should at times be approached in a systems way, with teachers, students, journalists and others being the various subsystems which in a way

may need energy from outside for effective functioning, just as living ecosystems need energy from the sun to survive. This energy in schools could come from the linkages with corporate sectors financing environmental activities. (Hough and Day, 2000).

Attempts have been made to incorporate EE in most subjects except in Physical Education (PE) subject. This incorporation would be a cost-effective media of EE communication and would be a good way of effectively utilising the games teachers who, in most schools in Kenya are grossly underinfused with environmental themes.

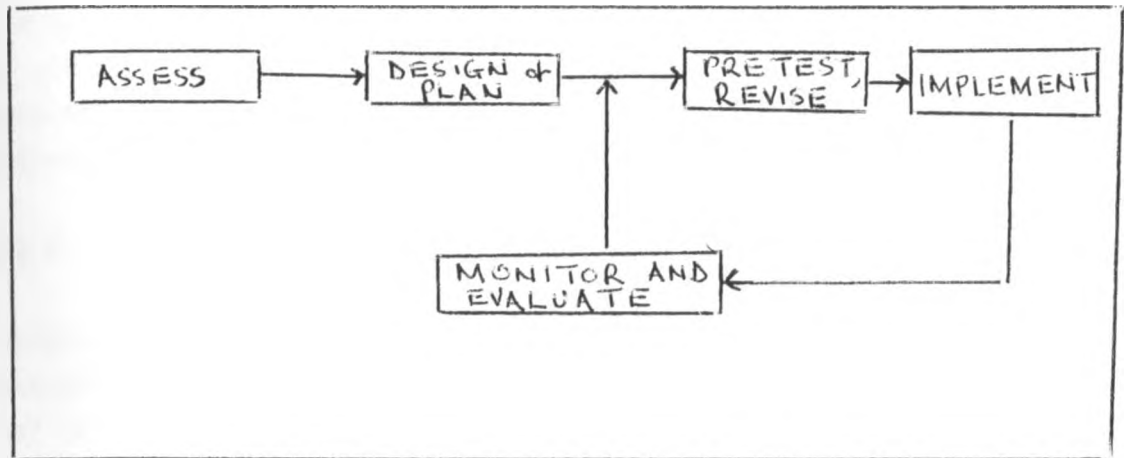
Other under utilised but powerful media include actual gardening clubs (such as 4K Clubs), songs as well as actual athletic / ball games / swimming competitions, whereby actual events could be oriented towards environmental activities. This again, besides creating fun for pupils, would attract corporate sponsorship for EE activities and events.

At the moment, most of the approaches towards solving the problem of the channel of communication for EE are being solved through the use of published materials as well as charts, essay competitions and posters that students are continuously being exposed to by UNEP, government publishers, Wildlife Clubs of Kenya among other organisations. To date, very little has been done on utilisation of cost effective and easily available resources, some of which at times may be freely available to schools such as the natural environment in the immediate school compound.

Although many countries have registered successes in creation of awareness on environmental degradation through EE, there is no corresponding success in people taking environmental action to reduce the effects of degradation, (Kara, 2001). Emphasis should be on media that should, together with specific national plans and strategies, go beyond merely raising awareness to practical commitment in solving environmental degradation. This would definitely start with the first major step being a study of the sources of information about the environment. (Monroe ^{Cline} Chambers 2000). This could be done in what Monroe and others have referred to as the "social marketing approach" This approach emphasises the importance of using a model that selects the most effective medium for communicating environmental messages. This is done by first carrying an assessment on the target groups information sources, then designing and planning the message, pre-testing and revising the message, then implementing the strategy or strategies and

finally doing a monitoring and evaluation process as shown in the following diagram.

Figure 1.0 Steps involved in social marketing approach for creating behaviour change



(Source: Monroe and Chambers, 2000)

To summarise, there are problems in imparting environmental knowledge in schools due to, among other reasons, lack of resources, under-utilisation or over-utilisation of some media in Kenya in general and Nairobi City in particular.

1.4 Study Objectives

The following are the main objectives of this study:

1. To determine the most common formal and informal media used in communicating Environmental Education concepts in primary schools in Nairobi City;
2. To find out the most effective media in communicating Environmental Education Concepts in the schools;
3. To discuss the factors influencing the choice and access to the media channels used in communicating Environmental Education concepts in primary schools in Nairobi City.

1.5 Literature review

This study focuses on media or channels of communication commonly used in primary schools in Nairobi City. The literature reviewed focus on areas of communication as well as the media used in communication. It is hoped that the review will contribute to the available body of information on communication in general and on media utilised in communication in particular whilst trying to focus on Environmental Education.

1.5.1 COMMUNICATION IN GENERAL

Communication as a process has been severally associated with the work of Lasswell (1948) who viewed it as involving the following five questions: who? (Communicator). Says what? (Content). Through what channel? (Media, channel). To whom? (Audience) and with what effect? (Effects).

Later works such as by Emery, et al (1960), Kalsi (1973) and shoemaker and Reese (1991) have supported this model of communication. However, this model has been criticised by scholars such as Mortensen and Seremo (1970) who see it as too mathematical and straightforward, arguing that communication involves social as well as interactive aspects hence the need to incorporate other models. Other models have tended to add new perspectives depending on the scholar's background. These include Shannon and Weaver's model of 1949 that stated the need for feedback. Westley and Maclean's model of 1957 stressing the role of an editor in mass media, among others.

In a study on visual communication in Kenya in the early 1970's, Kalsi (1973) underscores the role of media in communication. He asserts.

“.... Men today learn almost everything they know through some medium of communication - television, radio, newspapers, magazines, books and films.”

Kalsi's work examines the various media of communication albeit in a general way. However little attempt is made to study specific circumstances which merit specific media such as environmental games, theatre among others. Communication as a psychological process is mentioned, similar to the work of Nilsen (1970) and Fearing (1970).

1.5.2 COMMUNICATION IN ENVIRONMENTAL EDUCATION

The United Nations agencies recognised the importance of media in E. E. with the United Nations conference on the Human Environment (Stockholm) recommending the "Development and testing of new materials and methods for all types and levels of Environmental Education" (UN, 1973). Later UNESCO (1980) recognised the role of mass media such as television, radio and the press in EE. and called for "utilisation of all the educational resources available in a country." This was also emphasised by the Rio Earth summit with Agenda 21 chapter 36 calling for use of "Innovative teaching methods for educational settings" as well as "facilitation of low-cost or no-cost use of mass media for the purposes of education" (UN, 1992). Locally, the global recommendations have been reflected in the National Environmental Action Plan (1994) and the Sessional Paper No. 6 of 1999 on Environment and development (GOK), all of which call for development of suitable media for E. E. However, both policy documents albeit in good faith stop short of stating how the Kenya Government intends to go about developing such 'programmes' and 'strategies' The strategy does not focus on schools and is too general to be of much use to EE stakeholders especially primary school teachers. More issues should be addressed such as capacity building for teachers so as to enable them to effectively lead students in environmental actions.(Monroe and Chambers, 2000).

Today, the trend is not towards creating awareness only (Day, 2000) but also using media that will lead to effective environmental action. Monroe and Chambers (2000) suggests the use of 'social marketing approach' in which assessment of society's sources of information and their media should be undertaken so as to gauge the society's 'media diet'. This can also aid in focussing on the correct type of environmental message for action. Hernandez (2000) who calls for research on environmental messages supports this view and how they will be 'packaged' before a project is implemented.

1.5.3 MASS MEDIA

The type of media used can lead to successful communication or no communication at all. Mass media has been noted to have such a problem. This notion has been supported by Bayer (1995), Harris and Blackwell (1991) and Culling (1996). Their studies show that in a study of school pupils in Britain, some media used in EE such as television were seen to be the origin of misguided concepts and as such majority of the pupils perceiving pollution as the major cause of global environmental problems such as global warming, Ozone depletion and others. Tolba and Osama (1992) however, quote studies in United States of America showing popularity of television among young people while most adults prefer newspapers.

However, the mass media situation seems to be different depending on regions. In an investigation of environmental life experiences of environmentally active adults in their formative ages in Europe, Palmer and Neal (1994) used questionnaires and autobiographical statements of respondents to obtain aspects which motivated them to environmental active status. Out of 232 responses, 211 identified 'outdoor experiences' during their childhood as the main motivating media. 'Educational courses' taught formally in advanced levels of education were identified by a significantly high number of respondents. Television and mass media were positively identified while 88 respondents mentioned their teachers and parents as the motivating factor hence the need to incorporate parents in EE programmes in schools.

Cullingford (1996) points out that children become aware of environmental concepts long before they are taught in schools with their main source and media being television. However Stannistreet and Boyes (1996) argue that learning of environmental issues through the mass media is not adequate in that even if it is accurate, the opportunity for interaction with peers and colleagues to test whether they have misunderstood or misinterpreted the information is absent in 'out-of-school' sources.

Filho (1996), in another survey done covering the whole of Europe's 10-18 year olds identified mass media as the main source of environmental

information with schools coming second. Television and radio were identified by 38%, schools 34%, family 18% while newspapers and magazines by 10% of the respondents. Most students stated that they never undertook fieldwork activities.

However in a study of Colombia, a developing country, Macoby (1967) has shown that partial or full use of television could lead to better understanding of concepts in EE.

1.5.4. INVOLVEMENT OF LEARNERS AND STAKEHOLDERS

Successful EE programs should focus on society's relevant problems and endeavor to solve them (Mata, 2000). The same can also be said for suitability of channel of communication and its relevance to the users. Wanaswa (1993) argues that the design of channels used for communication in environmental education should involve learners so as to suit it to their situation. She lists, however, magazines such as 'pied crow' and 'outreach' as used for EE in Kenya although she shows little teacher/pupil inputs in their design.

In a study of EE in Caribbean, Glasgow (1993) states that students are involved in the design of posters such as against drug abuse, use of sustainable methods of energy with an evaluation coming in their formal examinations. In the examinations, pupils are required to demonstrate environmental knowledge as well as ability to undertake evaluation of environmental debates such as sustainable energy uses among other issues. He suggests generally that EE must be allowed to develop inside a country and not be imported from outside. This view is also echoed by Blanchard (2000) stating that care should be exercised in selection of media and strongly advises on the use of local channels and styles of communication and not merely the ones familiar with the planner.

Studies indicate that though mass media is a powerful tool or medium for communication of EE concepts, it should be utilised with a lot of caution. Shoemaker and Reese (1991) support the notion that that mass media content lacks in objectivity. Its content is affected by its writer's experiences, personality and knowledge and is a product of factors such as ideology of media owners, media routines, media workers and their socialisation as well as attitudes. Conclusion is drawn that media world

differs from the real world. This implies more involvement of EE stakeholders in design of environmental topics in mass media.

This view was differently echoed by Kenya's sessional paper no 6 of 1999, which states that:

“Media has limited access to factual information about the environment while most media workers have not been trained to report on environmental issues”.

However, EE stakeholders should consider Tolba and Osamas(1992) view and appreciate the potential role of press, radio and television as future effective media in communication, and that the number of radios between 1970 and 1990 increased by 58% world-wide and by 116% in developing countries while television sales increased by 100% world-wide and by 300% in developing countries. This means that information on major environmental disasters reach more and more people faster including school children in cities such as Nairobi. It is also to be hoped that more and more parents, teachers and school pupils be involved in design and operation of this media for communication in EE.

Recent studies have advocated a “systems approach” that views society as a system made up of interlinked components or parts and needing energy from outside to have an efficient output. Hough and Day (2000) state that teachers, students and even journalists are parts of EE subsystems that could be utilised in communication programmes for EE. These vital components of the system are open in that they can have linkages with other systems such as the corporate world. This provides some energy to make the environment system to operate. In short, the private sector should play an active role in sustainability of EE programs by providing additional incentives to keep the activities going. It is important to utilise the corporate sector in communication activities for the sector is in one way or another directly or indirectly involved either as beneficiaries or unsustainable users of the natural resources.

1.5.5. OTHER MEDIA

Muthoka, *et.al* (1998) outlines some additional methods of communicating E E such as experiments, debates, simulation and games. The use of games was also earlier recognised by Krupar (1973) as well as Stephenson (1967) with the later emphasising that “communication – pleasure” as opposed to

“communication – pain” checks monotony. Stephenson states that “play is enjoyed no matter who wins.”

Ombech(1997)^{and} Mata(2000) suggests the use of a mixture of media such as experimental work, field trips, exhibits, action research as well as the mass media in EE. However, Otiende (1997) adds that EE materials must not only be readily available and locally prepared but also clearly illustrate the purposes of the activities planned be of good quality and in sufficient quantities. He also adds that the most effective in communicating may also be the cheapest. This is also indicated by Allen (2000), in his experience in Gambia where awards, certificates and prizes by the government and Non-Governmental Organisations (NGO'S) reward environmentally active schools created a lot of environmental activities and competition among schools. Other relevant media include use of school Eco-clubs in promoting environmentally friendly actions even in pupils homes such as reduced personal water use in Jordan (Grieser, Rawlins and Tubaishat, 2000)

Kara (2001) explains that, despite high levels of awareness on environmental issues, environmental degradation continues unabated. He suggests that EE objectives and approaches as well as materials or media should be aimed at developing skills and not necessarily awareness only. The World Conservation Union (IUCN), (1997) recommends that communication programmes should be supported with appropriate structures and policies, otherwise EE recipients will be frustrated when they fail to effect environmentally friendly changes. It is also pointed out that lack of political will, lack of funding, capacity building and strategies that overlook the role of communication are some of the problems that are faced in EE. The use of information technology is recommended although it will be difficult for developing countries to afford this media.

Wanaswa (1993) laments that teachers charged with imparting environmental education have failed to establish a relationship with local community for interaction that will facilitate actual environmental experiences. Emphasis should be on the need to “encourage community participation in teaching programmes at school”. However, the method on community integration in school programmes will need to be explained first. For example Otiende(1997) supports a negotiative approach in persuading people to change to environmentally friendly actions. Tarte (2000), IUCN/CEC (1997) and Monroe and Chambers (2000) support this. This, they assert is due to the growing spirit of democratisation in the world in

which a two way process of participation is desirable for consensus building for effective environmental communication.

Kabwe (1978) explains that the use of theatre in communication is a cheap media that does not need vast sums of money, as is the case with electronic media.

To avoid the environmental message losing meaning or 'semantic noise', there is need to also consider the audience's level of understanding, their assimilation of communication (Bayer 1995) since people are at the centre of 'everything', (Annan, 2000). This is essentially so since people after all, are the recipients of information, and thus the channel used should be the one most suited to their needs. The need for evaluation of a society's 'media diet' so as to select the most appropriate method in terms of effecting environmentally friendly actions and suitability to local conditions. This study is an attempt to increase knowledge on EE communication media. Besides, the study will attempt to find out the challenges facing EE in Nairobi City primary schools. It is hoped that policy makers interested in enhancing behaviour change for a better and friendly use of our natural environmental resources will find the findings of this research useful.

The next section briefly discusses the underlying theoretical framework within which this study was undertaken.

1.6 Theoretical Framework

Generally communication as a process has several theoretical models. The earliest and most basic model dating back to 1948. This model was developed by Lasswell, (Fiske, 1990)

The Lasswell model was based on a mathematical / linear model of "who, says what, through what channel, to whom, with what effect". This model had little or no emphasis of feedback interaction as well as the role of understanding of messages in a given social context.

Newcomb model (1953) on the other hand brings in the idea of communication in a given social context. This means that communication does not occur in a vacuum but in a societal context. Gerbner's model (1956) brings in the factor of access and control of media as a means of exerting power and societal control. Westley and Maclean's model (1957) points out the role of an editor as a regulatory factor in mass media.

Jackobson (1960) (a linguist) had his model addresses semantic or meaning and interpretation obtained from the message, (Fiske, 1990). All these models are too general and do not specifically address Environmental Education and environmental actions as formulated in this study. Due to this reason, they will not be used in this investigation.

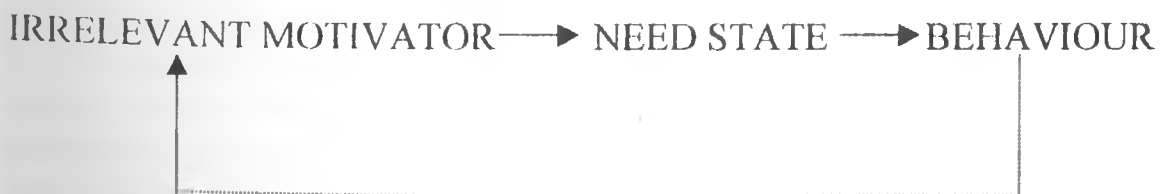
For the purpose of this study, the ‘environmental communication model’ as given by Sandman will be more appropriate. This model developed in the 1970’s is a combination of two models, that is ‘Educators Model’ as used by early scholars and educators to create awareness and the ‘Advertisers Model’ as used by advertising companies to effect change of behaviour. (Day, *et al* 2000). These models are shown below.

Fig 1.1 Educator’s Model



Educators used this model which assumed that by giving information to people or students, new behaviour is automatically developed. This proposition has been refuted by scholars (Kara, 2001, Monroe and Chambers, 2000). The Advertiser’s Model is presented below.

Fig. 1.2 Advertiser’s Model

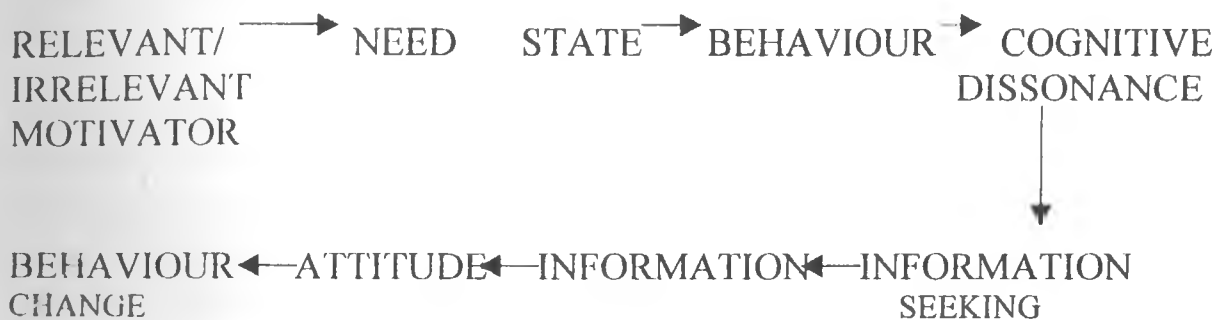


To advertisers, an irrelevant motivator is an attention grabber that an individual is exposed to (as a fact about life or something that motivates him or her to buy a product) that appeals to his emotions, status or sexual appeal at times, and leads to a need state which leads to behaviour change in motivating them to buy the product. Once motivated, the need and behaviour

change may reduce unless the individual is exposed continuously to the advertisement. Hence most adverts do not appear only once but severally so as to sustain the behaviour change.

Sandman used a combination of both models to come up with Environmental Communication Model as shown below:

Fig. 1.3 Sandman's Model of Environmental Communication



(Source: Day and Monroe, 2000)

In Sandman's model, a motivator is used deliberately, say a child who invites her parent to an environmental activity at school. The parent in turn, after getting the environmental message gets in a need state of planting a tree due to the need for status or wants to seem to be a good and concerned parent. This leads to an initial small amount of behaviour change.

The environmental action leads to what is called a state of cognitive dissonance. This is a situation in which the parent questions or ponders his or her action. For example, 'why am i doing this?' 'is it really worthwhile?' among others. This makes them to seek good reasons to justify their environmental actions hence, the information seeking stage. On getting the information, the behaviour is reinforced and the parent may find himself or herself repeating the action, thus leading to a prolonged or long-term behaviour change. Based on Sandman's model, this study's conceptual framework is shown in figure 1.4.

1.7 CONCEPTUAL FRAMEWORK.

As given in figure 1.4, the media of communicating EE concepts in Nairobi primary schools is affected by many factors. One of these is lack of easy access to media facilities such as computers in schools but unavailable to needy pupils.

Economic factors such as costs of purchasing equipment such as television, computers and others, lack of teacher training, poverty of pupils' parents limiting the capability of parents in sponsoring their children to areas where environmental awareness is created such as National parks, animal orphanage, museums, animal sanctuaries. Some schools may also lack space resources, that is, adequate land for tree planting, botanical gardens, tree nurseries, bird feeding among many others. Thus most schools tend to depend mostly on textbooks and the teacher as the most common media for EE.

Socio-cultural factors have been found to influence the use of certain types of media. These include the language used in informal media such as in newspapers, television programmes on environment as well as posters. In most rural schools, the use of vernacular languages from class 1-3 may promote acquisition of some environmental knowledge. This knowledge differs from urban schools whose media of instruction is English and Kiswahili.

Biophysical factors also affect EE media. In some schools, rain can disrupt outdoor projects and indoor projects if a school's physical location is not safe. Also if a school is not well-roofed, media such as posters and electronic equipment are easily destroyed. Some schools are located in areas with different natural environmental facilities in the vicinity such as good soils for tree planting. Black cotton soils in eastern sections of Nairobi are quite a challenge in establishing some botanical gardens. A nearby river such as Nairobi River that can be used for learning pollution but cleaning it can be quite a challenge among other activities. Some schools are in slum areas such as Mathare Valley, Korogocho, Kibagare among others and experience natural hazards such as flooding and diseases periodically. These, however can be a useful media for learning on topics on hazards without incurring extra travelling costs.

Stakeholder involvement in design and in choice influences the effectiveness of the media recommended for use by curriculum developers. It is important

that pupils role as stakeholders be recognised for the success of environmental communication might be enhanced by involving them in designing and planning. Also teachers should be more involved in design and choice of media for EE as they are the implementers of EE in schools.

The above factors show that the media available to Nairobi schools for use in EE can be affected by many factors even before the teacher can choose from the available choices as shown in figure 1.4.

After the teacher chooses a given media, there are other challenges such as the quality of the message transmission. This may arise due to 'noise' or external interference to the message. Other challenges include the level of attention of the pupils, clarity of the teacher's voice, and other sources of noise from the surroundings. Some media types may be influenced by this 'noise' more than other types, which means careful selection of the one with the least 'noise' or interference. This is the media that conveys environmental information with minimal external interference.

We should note that the teacher's choice of media might differ with the pupil's choice. This could be because both have different levels of training and different age brackets. It is important for teachers to find out the interests of their pupils so that their media choice is likely to interest them.

Once the teacher selects the media, the pupils are expected to receive the message that can lead to environmental awareness. A state of 'cognitive dissonance' must be effectively created so that the pupils can receive adequate information to satisfy their curiosity as to why it is important, say to plant trees. This could lead to observable environmentally friendly behaviour change. If no "need state" is created and the pupils' interest is not sustained, then no positive change in environmental behaviour is expected. Therefore, there is need to constantly use the preferred media to communicate in environmental awareness so that their interest is sustained and ultimately leading to environmentally friendly behaviour change.

At this stage, it is important to show this study justification. This is done in the following section.

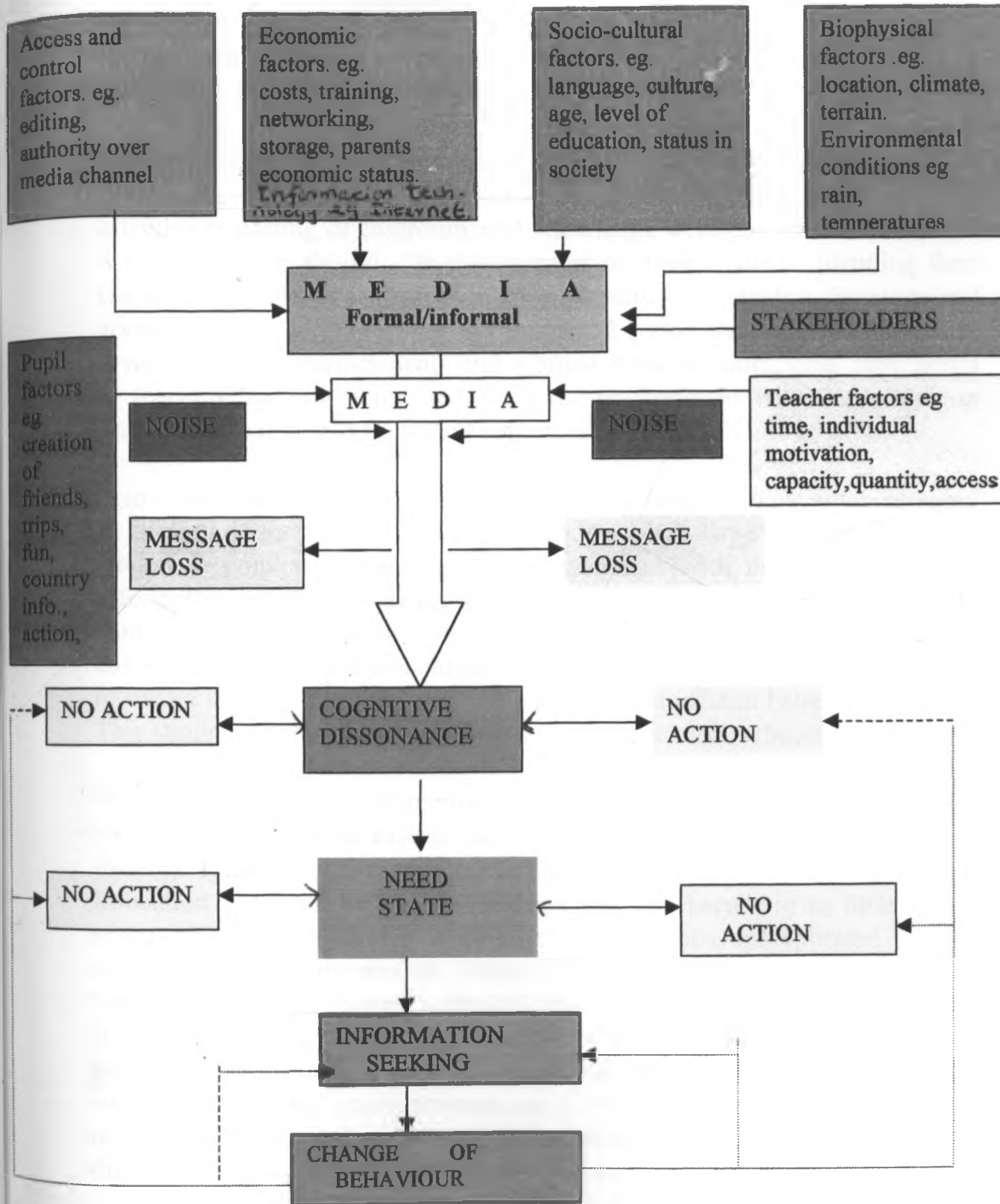


FIGURE 1.4 CONCEPTUAL FRAMEWORK OF MEDIA OF COMMUNICATION IN ENVIRONMENTAL EDUCATION FOR PRIMARY SCHOOLS IN NAIROBI (Source, Researcher,2002)

1.8 Justification of the Study

Environmental Education has gained much global attention since Stockholm conference of 1972, through Tbilisi Inter-governmental Conference on EE (1977), Rio Summit of 1992 and the recent World Summit on Sustainable Development held in Johannesburg, South Africa last year. The Tbilisi Conference was of utmost importance to EE because guiding principles for effective imparting of environmental knowledge were put forward. Principle 8 stated that EE should “enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences.” Principle 12 stated that EE should “utilise diverse learning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on practical activities and first-hand experience.” (UNESCO, 1980).

Many non-governmental organisations dealing with EE have since emerged in all parts of the world. However, in spite of their large number, they have tended to emphasise on creation of awareness with the hope that from information availed to people especially pupils, actions will result. Little studies have been done on what motivates people to change to environmentally friendly behaviour (Hernandez and Monroe, 2000), the role of media in motivation and the efficiency of the media in behaviour change. This study examines the media diet of pupils in primary schools in Nairobi.

With advancement of communication and technology growth in the world, Kenya has experienced effects too. The use of computers is now common through little use of computer technology in imparting Environmental Education has been achieved. Perhaps this has been due to little or no resources allocated to EE even after it has been incorporated in our curricular. This study was an attempt to establish the situation in Nairobi, which is actually the largest communication centre in Kenya and East Africa. It is important to remember that the aim of EE. is not to pass examinations but to change attitudes and develop skills aimed at taking action to develop sustainable habits of environmental use. Utmost care is needed thus to pass on the Environmental message such that the goal is reached with minimal difficulties in terms of cost and effectiveness.

The Kenyan Government key policy documents on Environmental Education such as the National Environment Action Plan (1984), recognise the problem of the channels of communication and even recommend ways of dealing

with this problem. But the matter rests as a 'wish list' of "recommendations". Therefore there is need for a study such as this on dynamics of the media of communication so that the recommendations are implemented using only the most effective ones.

In addition, the Kenya Government has recently enacted the Environmental Management and Co-ordination Act (1999) that provides the legal and institutional framework for environmental protection. This is very commendable. However, passing of the Act should not be the end of the road but just the beginning of the journey. An appropriate backing of the act should be put into place to ensure compliance. According to Hernandez and Monroe (2000), enforcement of environmental legislature is much simplified if accompanied by a suitable education campaign to explain the need for the new legislation. This education campaign will have to be 'suitably packaged' with the appropriate message and channels of communication chosen after careful research. (Hernandez, 2000).

However, environmentalists have justifiably felt that EE is 'lost' into the curriculum after being infused. (Otieno, 2002). It has become just another topic, or at times an appendix topic in a sea of academic topics thus the media used is also the media utilised in other subject areas in the curriculum. There is need, therefore, for research on the development of a media that separates, highlights and makes EE easy to teach, enjoyable, reaching a wide audience than the confines of the 'school - fence' (UNESCO 1980), integrated, with a good 'face-to-face' feedback as well as other advantages of physical fitness - such as would be gained in the use of environmental games, fieldwork excursions and others.

The study aimed at establishing the role of media in communicating EE in Nairobi primary schools using mostly upper primary pupils as source of research. Children constitute an effective group for targeting for environmental awareness since they will carry the message home, and utilise it after they have left school, (Barkataky, *et al*, 2000). Also, Masaviru (1987) established that only 14% of primary school graduates ended up in secondary schools, 14% either repeated and 72% effectively ended their education. Although the figures could have changed by 2002, the situation could still be almost the same. This indicates that EE in primary schools could be the only formal study for the high population that drops out of school.

This study's scope and limitations are outlined in the next section.

1.9 Scope and limitations

This study focused on common formal and informal media utilised in Nairobi area only and factors affecting choice and access by teachers and pupils in different schools. Some of the media used includes the textbook recommended by KIE, use of posters, magazines, newspapers, the teacher, sometimes an occasional trip to a place of environmental interest, with some of the schools endowed with some economic might using televisions or even computers. However this is not an exhaustive list. It is hoped that the study will establish other unique media used in schools and study the dynamics of each media in encouraging environmental behaviour.

Due to lack of funding, the study relied on a sample of 8 Nairobi Primary Schools. Although small, this sample was quite representative because as many educational divisions as possible were represented. Also, both public and private schools from different socio-economic backgrounds were represented. This sample incorporated pupils from class 6, 7 and 8 only. These classes were chosen because they represent an academic group that is almost completing the first cycle of the national 8-4-4 educational system. This makes it an ideal group for evaluative purposes. Also, as earlier mentioned, most Kenyans stop their education at class 8. Less than 50% of Kenyans proceed to secondary schools. This means that the knowledge gained in primary school is of paramount importance in their future lives. Another reason for using upper primary pupils was that they can easily be able to handle a questionnaire without a lot of problems such as explaining the meaning of most words, something that would not be quite possible with lower primary students.

The population of the study area comprised of 154,024 pupils in public primary schools as well as an unknown number of pupils in private primary schools within Nairobi City. With the limited time and resources available, the size of the sample was kept at a minimum standard without compromising quality of the research.

Another limitation was access to teachers. In a number of instances, getting access to teachers faced bureaucracy from school heads who insisted that teachers were busy. In such situations, administering questionnaires to

groups was not possible. This led to non-return of a number of questionnaires.

In summary this study has not discussed all the media used and has only concentrated on the common ones in Nairobi City Schools only, due to limitation of resources and time. It is important to note that the study focus is not on the whole process of communication but only on certain media / channels that facilitate communication of Environmental Education.

The study did not investigate the background characteristics of the pupils, schools teachers for similar reasons as above. It is assumed that the sample has normal characteristics in distribution and other socio-cultural factors.

At this stage it is essential to define the concepts that will be used for the purposes of the study. This is done in the next section.

1.10 Definitions of Terms and Concepts

For the purpose of this study, the terms and concepts used are defined as follows.

Environmental Education Process of developing a world population that is aware of and concerned about the total environment and its associated problems and which has the knowledge, skills, attitude, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones (Monroe and Chambers, 2000)

Communication - A psychological process whereby a message is passed from a source or communicator or encoders through a medium or channel to a receiver or decoder in a social and interactive situation.

Environmental communication A two way process of information exchange to mobilise individual and collective action for the environment.(The World Conservation Union-IUCN, 1997)

Communicator	A person who is involved in communicating EE concepts
Channel / media -	Devices and methods which are deliberately used to communicate a message.
Formal media _	Media used in the formal curriculum such as teaching aids, textbooks, the teacher, and resource persons.
Informal media _	Media used outside the formal curriculum such as newspapers, magazines, environmental games, and field trips among others.
Mass media -	Media which does not demand the actual presence of the communicator e.g. television, radio, newspapers, films among others
Media diet	Both formal and in-formal media mostly used in primary schools in Nairobi City.
Cognitive dissonance	A state of mind or a situation that arises in an individual, which involves questioning whether an action undertaken is right or wrong.
Environmental games	An activity whereby a series of games are organised with environmental themes and for raising money for an environmental purpose.
Poverty	A situation of inadequate resources in financial or otherwise which results in lack of use of some media in EE
Social marketing approach	An approach followed by social marketers in creating behaviour changes and sustaining markets for their goods.

CHAPTER TWO

2.0 Background to the study area.

Location and size of Nairobi

This study focuses on Nairobi City, which is the biggest industrial and capital city in East Africa. Nairobi city is the capital city of Kenya which is situated on the Equator between latitudes 4 degrees 30 minutes North and 4 degrees 30 minutes South and longitudes 34 degrees and 42 degrees East of the Greenwich Meridian (map 1).

Nairobi is the main urban, transportation and industrial centre in Kenya and East Africa (Opinya, 1982) and is situated in the southern end of the mainly agricultural Central Kenya where tea, coffee, dairy and plantation farming among others are some of the main land uses, (Ojany and Ogendo, 1987).

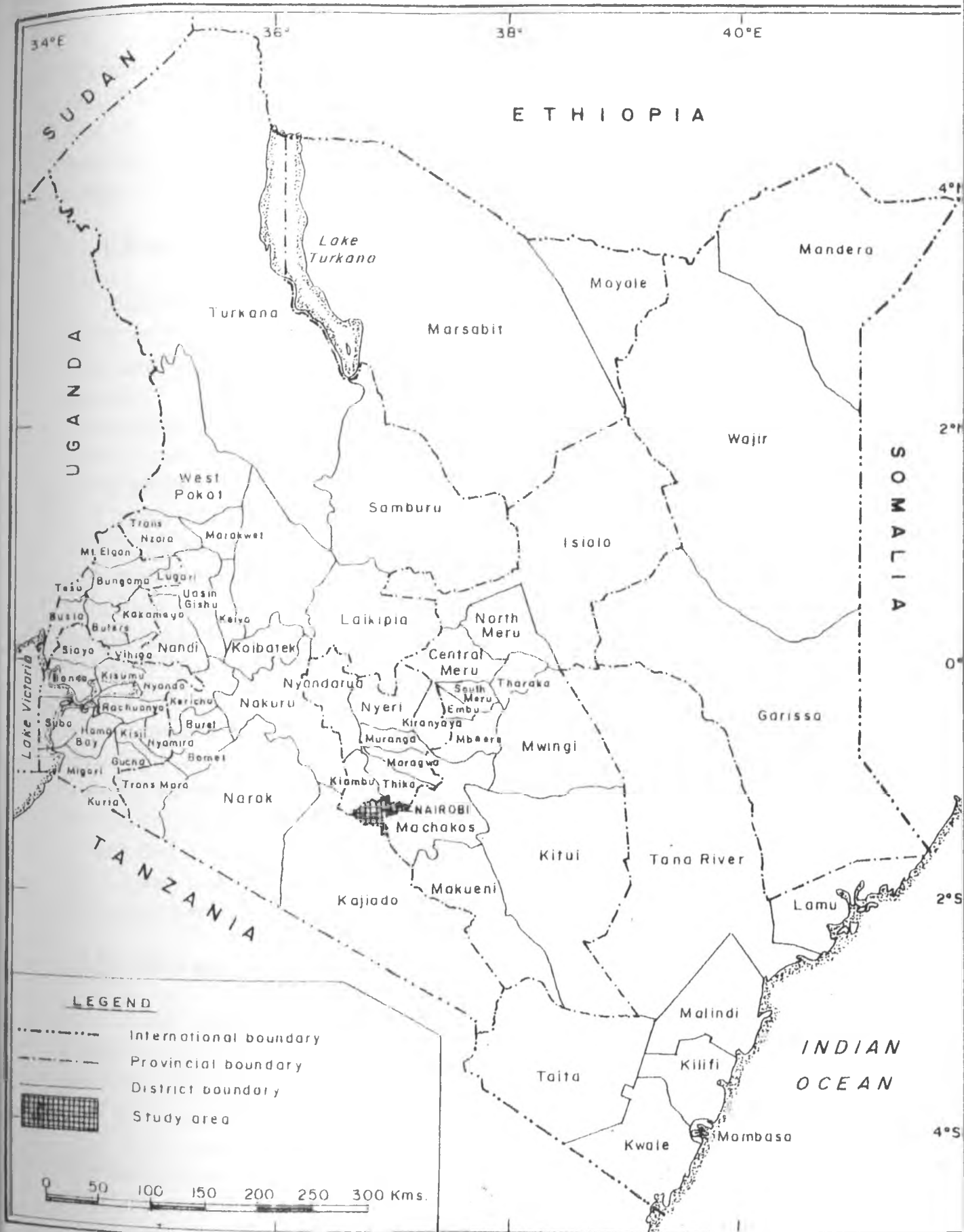
Nairobi's Altitude is about 1670 metres and is located about 140 Km South of the Equator (Thompson and Sansom, 1967) covering an area of 696 square kilometres or 68,945 hectares.

2.1 Physical characteristics of Nairobi

Relief and Geology

Morgan (1967) has divided Nairobi area into three different physical zones. There is the zone referred to as 'hilly and broken country' or part of Kikuyu dissected plateau to the north, north-west and west with the highest point being 1905 metres above sea level dropping to 1676 metres above sea level at the city centre. This zone otherwise referred to as the plateau surface is covered by lava flows known as the Nairobi trachytes (Mwenje, 1993), a light grey stone interrupted in several areas by tuffs. The Nairobi trachytes are of the pliocene era in the geologic time scale (Williams, 1967)

The second zone is the generally flat Athi plain to the east, southeast and south of the city. This zone has an average height of about 1500 metres above sea level and consist of successive layers of Nairobi phonolites which are hard, dark grey lava sometimes referred to as "black-trap" (Walmsley, 1957) and Kapiti phonolites which have weathered to produce mostly black cotton soils in the plains (Nyaga, 1998). Some parts of the area experiences waterlogging after heavy rains. The Embakasi area is especially underlain by the Nairobi phonolites, which are about 5.2 million years old (Williams, 1967). The Nairobi Game Park area is made up of Mbagathi phonolitic



Map 1 Location of the Study Area in Kenya.
Source: District Development Plan, 1997-2001

trachytes whose composition is between phonolites and alkali trachytes older than the Nairobi phonolites.

The South-Western area physiographically is referred to as Kikuyu undissected upland and is basically open country with low hills and ridges. This area is composed of Ngong Basalts.

Climate

Nairobi's climate is basically tropical (Opinya, 1982), with two rainfall peaks of long and short rains. These rains are sometimes associated with certain environmental hazards such as diseases linked to flooding and also drought.

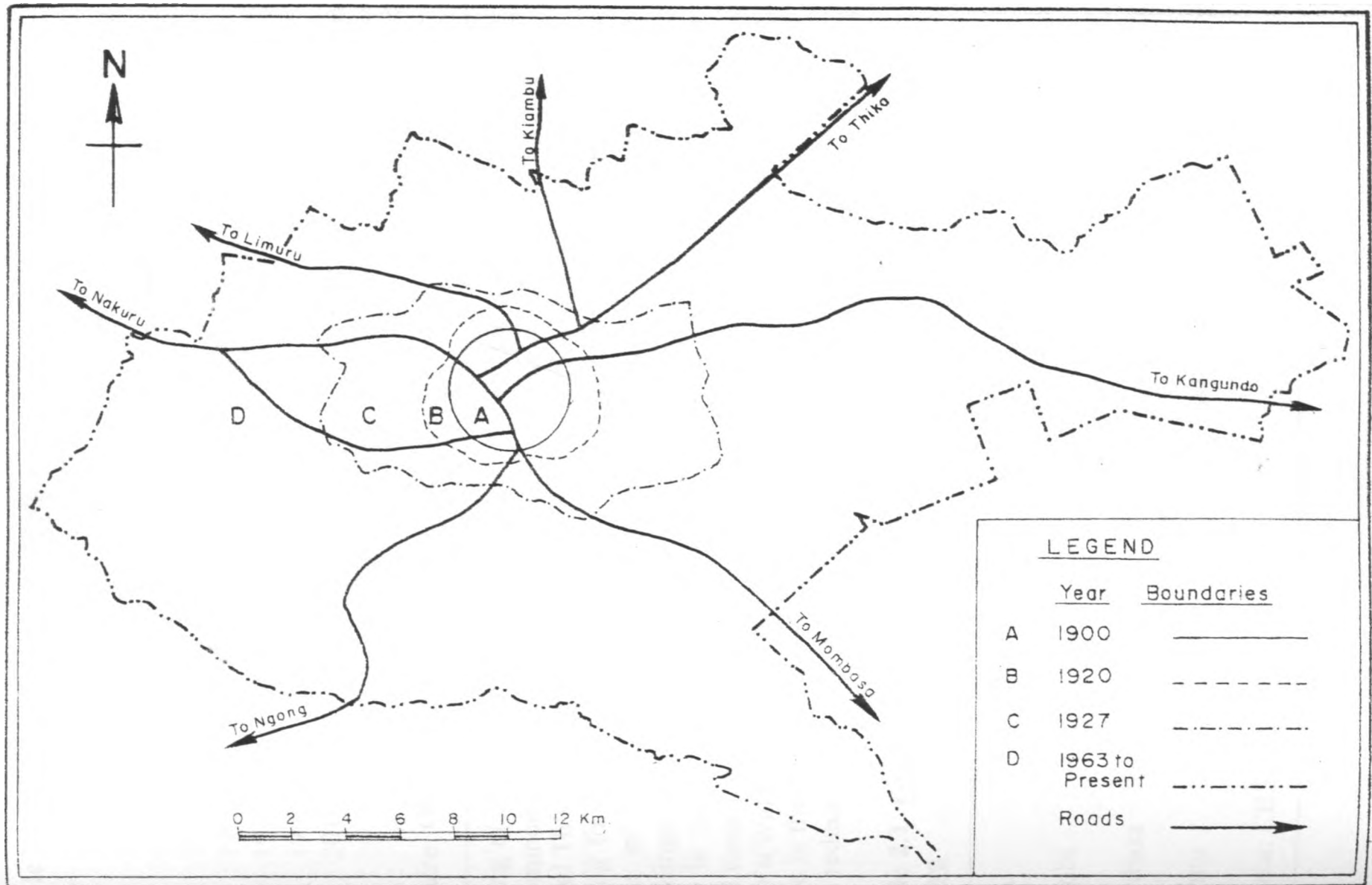
Thompson and Sansom (1967) divide Nairobi's climate into four seasons. There is the Northeast Monsoon season from December to March that is characterised by northeasterly winds bringing sunny, warm and hot days with good visibility and occasional showers around December and January. This is followed by the rainy-season from March to May characterised by light winds blowing easterly then Northeast and later south easterly. These bring rain and showers with some occasional dry periods developing more clouds towards the end of the season. The Southeast monsoon-is next with persistent south-easterly winds bringing cloudy, overcast conditions, cool and cold at high altitudes with some little rain that increases towards the end of the season. Finally the cycle is completed by a rainy season-in November with light easterly winds changing from south-easterly to north-easterly bringing warm, sunny and showery conditions to Nairobi area.

The hottest month has a daily mean maximum temperature of 28 degrees celsius and a minimum of 14 degrees celsius while the coldest month has a daily mean maximum of 23 degrees and a minimum of 12 degrees celsius. The upper part of the city is wetter and cooler than the lower parts.

2.2 Growth and Population of Nairobi

Since 1899 when the Kenya-Uganda railway constructors established a station at the current location of Nairobi city, Nairobi has grown both in area and population. **Map 2** shows the growth in area between 1900, 1920, 1927 and the present area that has remained unchanged since 1963.

Prior to and after Nairobi's elevation to a city status in 1950, Nairobi's population has been on an upward trend. Table 2.0 shows that in 1999, the population was more than 2.1 million.



Map 2 The City of Nairobi: Boundary changes from 1900 to the present.

Source: Obudho and Aduwo, 1988.

Table 2.0 Population Growth of Nairobi

<u>Year</u>	<u>Total population</u>	<u>% of Kenya's population</u>
1906	11,512	—
1948	118,900	2.3
1962	266,795	3.1
1969	509,286	4.7
1979	837,775	5.5
1999	2,143,254	7.3
2010	3,900,000* (Projected)	—

(Source: Obudho, 1987, Ndolo, 1996, and Central Bureau of statistics, 2001)

Ndung'u (1998) estimates that about 55% of the city's population is accommodated in overcrowded informal settlements in the Eastlands region alone! This has serious implications on the quality of the environment.

Owing to the rapid population increase shown above, Nairobi has had its share of environmental problems. Poor sanitation and congestion of dwellings are said to have caused plagues in 1906 and 1912 (Obudho, 1987). Also in the 1970's cholera outbreaks were reported due to poor sanitation conditions. Persistent water shortages have been experienced since 1950's (Walmsley, 1957), a fact attributed to poor planning (Obudho, 1987) while in the 1960's, much of the original montane forest around the city had been reduced by rapid expansion of population settlement (Trump, 1967)

Table 2.1 Comparison between Nairobi's population and other cities in Kenya

<u>City</u>	<u>Total Population</u>	<u>Population Density</u> Persons per square km
Nairobi	2,143,254	3,079
Mombasa	665,018	2,896
Kisumu	504,359	549

(Source: CBS, 2001)

Table 2.1 shows Nairobi and other major towns in Kenya and their populations. Both Kisumu and Mombasa were apparently elevated to city status in the year 2001. All the cities have generally similar urban environmental problems. The fast growth and attraction of employment opportunities both real and assumed in these cities has led to shortages of housing especially in the capital Nairobi, (Opinya, 1982) as well as problems of waste disposal, (Obudho, 1987) persisting up to the present time. High fertility rates, falling mortality rates and immigration has been stated as having affected demand for primary education. (Mwangi, 1988). It is important to point out that Nairobi's environmental problems are similar to a large extent with problems in other developing countries whose cities are rapidly becoming congested. Table 2.2 indicates the population of Nairobi in terms of households and sex in comparison to the national figures. Note that the number of males is higher than females in Nairobi.

Table 2.2

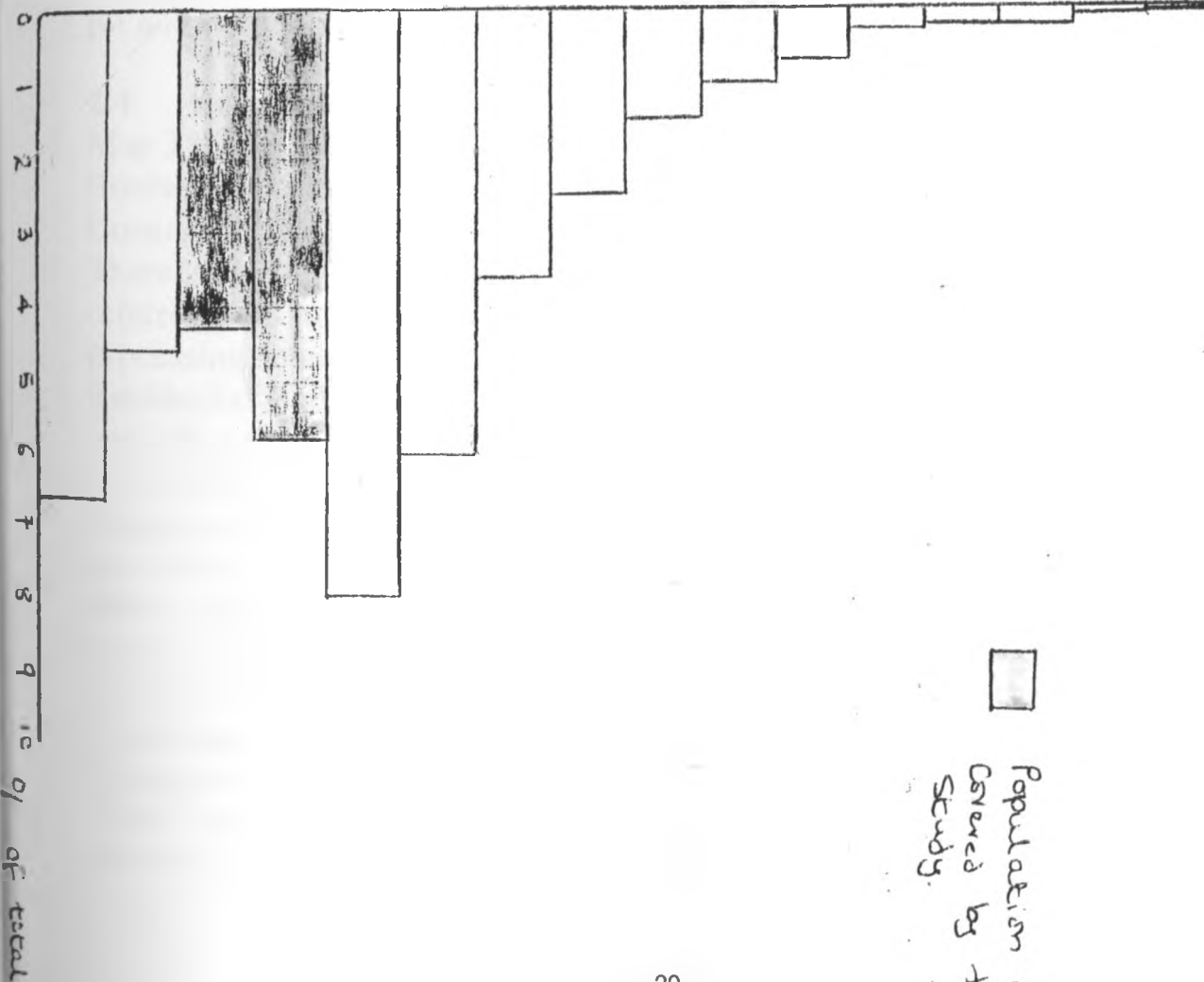
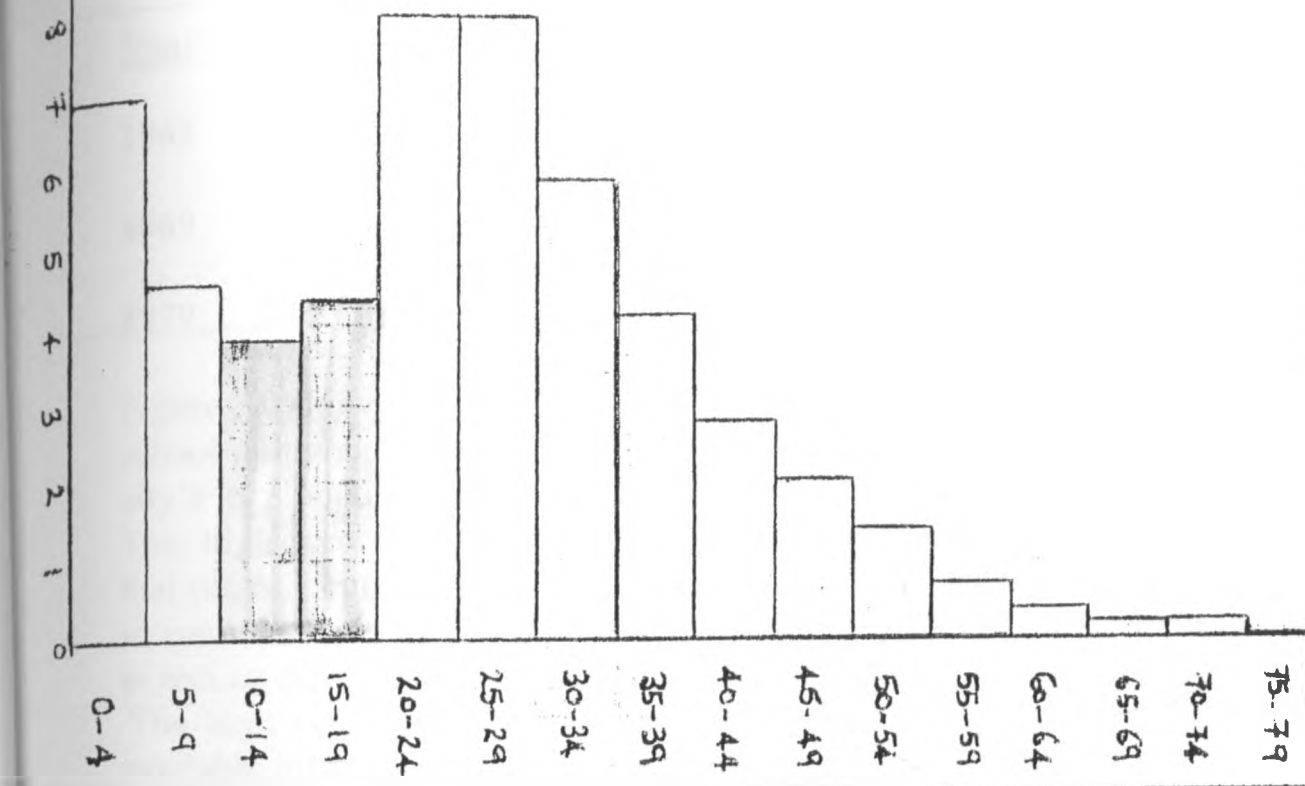
Nairobi: Total Households and sex compared with National Totals

<u>Nairobi</u>	<u>Kenya</u>
Households	
649,426	6,371,370
Males	
1,153,828	14,205,589
Females	
989,426	14,481,018

(Source: CBS, 2001)

Recent research has shown that Nairobi's population is becoming younger and younger with an increasing proportion of children in the age group 0-14. (Owuor, 1989). Table 2.3 shows the percentage of that age group.

10
9
8
7
6
5
4
3
2
1
0



Population Age-
Groups by this
Study.

Table 2.3 Proportion of Nairobi's Population(Age group 0-14)

<u>Year</u>	<u>Percentage</u>
1962	32
1969	36.0
1979	40.2 (Source: Owuor, 1989)

Figure 2.0 shows the population structure of Nairobi City (GOK, 2000). The school going age of children (5 years to 19) years accounts for 27% of the city's total population.

This high percentage indicates a substantial reservoir of young population that can be targeted for EE. The population would need effective approaches in communication or media so as to encourage them to take on "eco-living" to reduce deterioration of the environment.

The high proportion of young people also exerts heavy pressure on the available infrastructure and other available facilities as well as the demand for and supply of primary education.

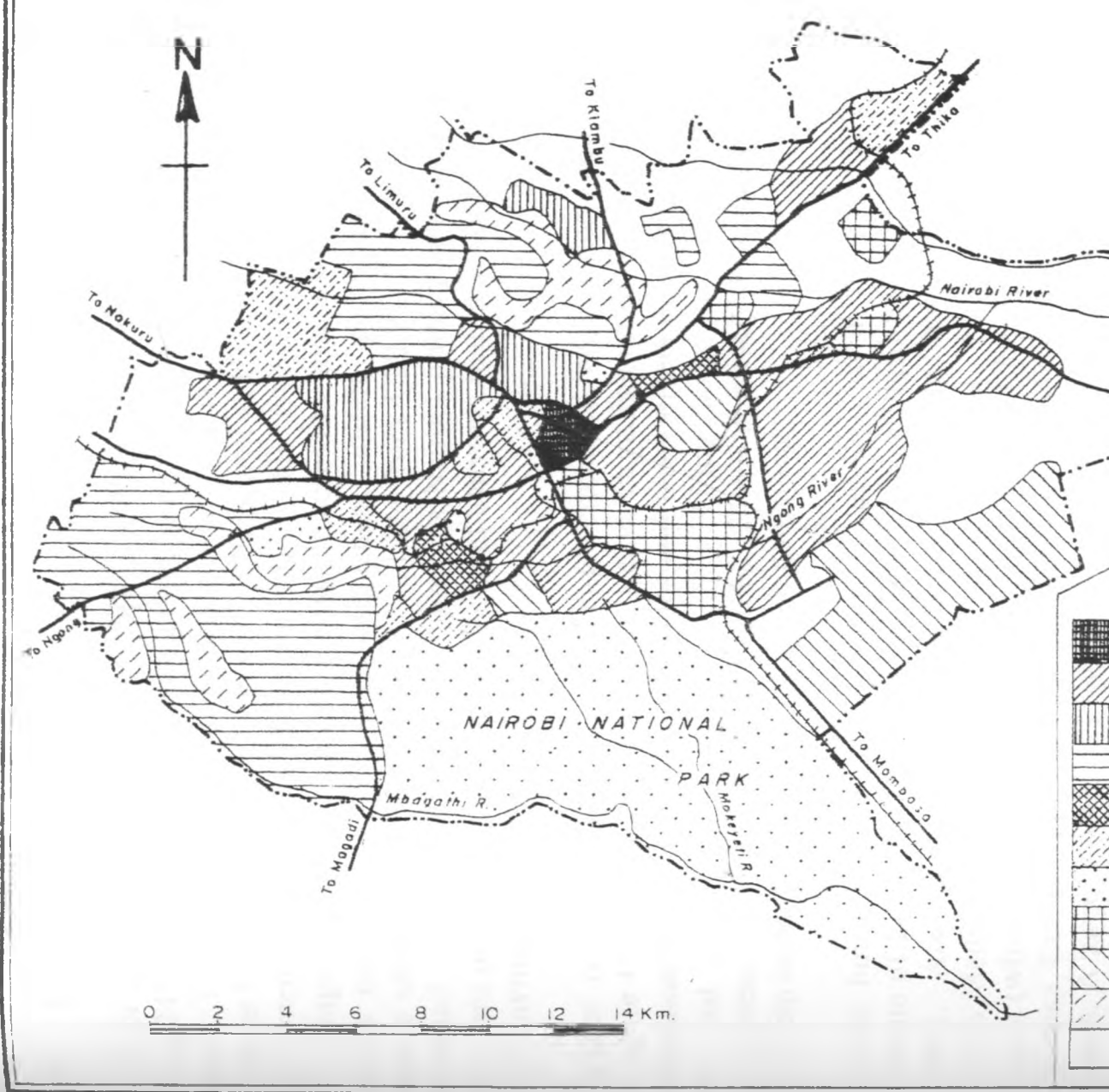
2.4 Land use

Map 3 shows the major land use types in Nairobi city. These include Central Business District (CBD) characterised by skyscrapers and intensive land use. Concrete surfaces generally cover this area.

There is also an industrial area on the eastern part of the city normally referred to as Industrial Area. Fairly recent developments include export-processing zones towards the outskirts of the town.

Residential land use takes a relatively large section (84% of the city, according to Obudho, 1987) comprised of low-income high-density residential areas in the eastern sections of the city such as Dandora, Kayole, Eastleigh, Mathare North among others. Also Slums and squatter settlements are found in areas such as Mathare Valley, Korogocho, Kibera among others. Middle-income medium density areas include the western and eastern parts of Nairobi such as South B, South C, Buruburu, Doonholm, Nairobi West among others. High-income low-density areas are mostly in the northwest and southern areas which include Karen, Lang'ata, Muthaiga, Lavington, Gigiri and Westlands.

Public buildings including institutions such as universities, primary, secondary as well as colleges also occupy modest space.



Map 3 Land Use in the study area

2.5 Environmental Agencies

Nairobi hosts the United Nations Office in Nairobi (UNON) which in turn hosts 24 UN agencies some dealing directly or indirectly with environmental issues. Two agencies have their headquarters in this city. These are United Nations Environment Programme (UNEP) as well as United Nations Human Settlement Programmes (UN Habitat). This gives Nairobi a unique advantage over other countries in possible access to media from the World bodies especially UNEP since magazines, posters, published literature among other resources are freely available from UNEP. This would be expected, obviously to place the numerous Nairobi primary schools at the forefront of environmental awareness and activities that help communicate vital environmental knowledge.

Nairobi is also home to many non-governmental organisations such as Wildlife Clubs of Kenya (W.C.K.), Kenya Organisation of Environmental Education (K.O.E.E), Uvumbuzi clubs and many others all of which target the vast school communities as their spring board to environmental awareness. This large catchment can be utilised positively to impart on EE and help increase eco-living in their communities.

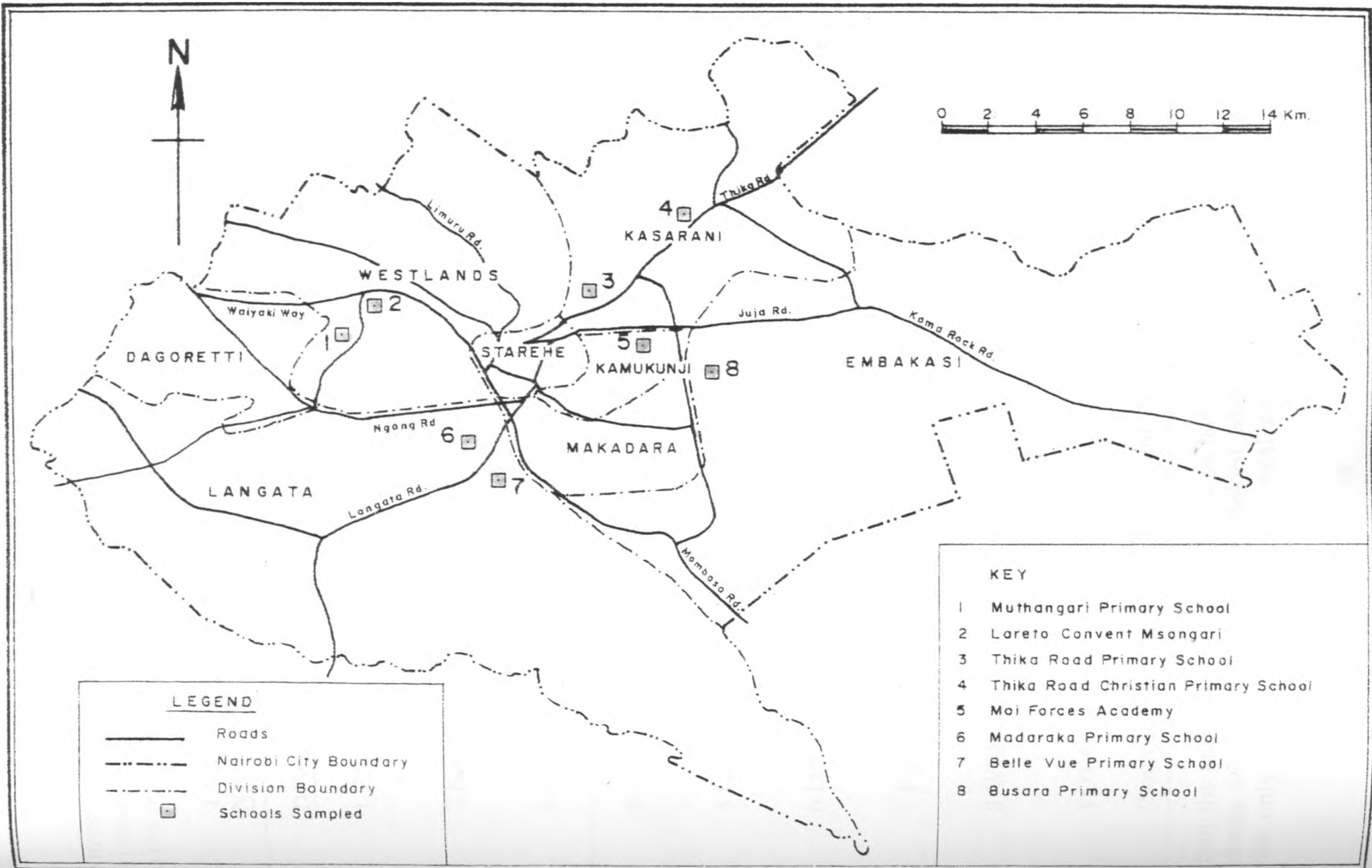
Nairobi houses Centre of Curriculum – development in form of Kenya Institute of Education (K.I.E) which has a fully fledged Educational Media Centre. Also, several mass media houses are located here. These include Nation Media (which runs ‘Nation Newspapers’, and ‘Nation Television’), Baraza (which owns ‘East African Standard’, ‘Kenya Television Network’,), Kalamka Limited (which runs ‘The People Daily’) among other media houses. A large number of Frequency Modulation (FM) stations are also in operation. Mass media can be a powerful channel of inculcating environmental messages and encouraging eco-living in our society.

This research attempts to find out the role of various media centres in EE in primary schools in the study area

2.6 Primary schools in Nairobi city

Generally, Nairobi province is divided into 8 divisions for educational purposes. These include Embakasi, Kamukunji, Starehe, Makadara, Langata, Dagoretti, Kasarani and Westlands divisions. (see map 4)

Table 2.4 indicates that each of these divisions is further divided into two zones with each zone covering several schools. Currently, there are 16 zones



Map 4 Nairobi Educational Divisions and location of schools sampled
 Source: Modified from Survey of Kenya by Researcher, 2002.

comprising of 191 schools (25 informal schools, and an estimated over 50 private/community ones). This shows a marked increase from 150 in 1989 to the present 191 schools.

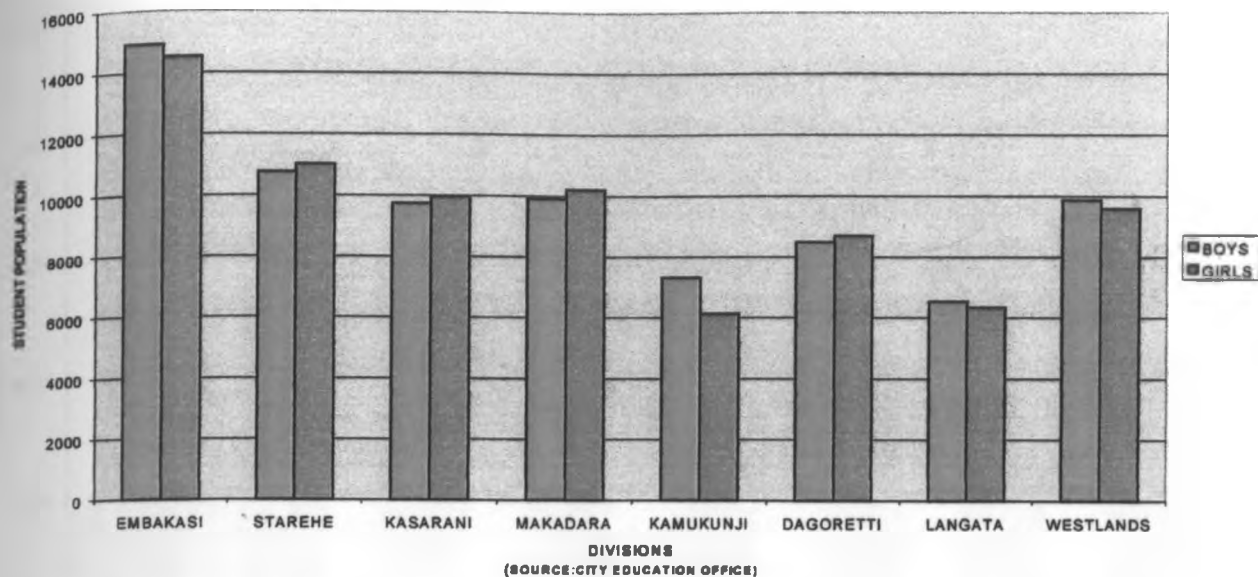
TABLE 2.4 TOTAL NUMBER OF PRIMARY SCHOOLS IN NAIROBI

<u>DIVISION</u>	<u>ZONES</u>	<u>NUMBER OF SCHOOLS</u>
1.EMBAKASI	KAYOLE	16
	DANDORA	14
2.KAMUKUNJI	BAHATI	10
	EASTLEIGH	7
3.STAREHE	CENTRAL	15
	JUJA ROAD	16
4.MAKADARA	BURUBURU	14
	VIWANDA	12
5.LANG'ATA	KAREN	6
	NRBI WEST	8
6.DAGORETTI	RIRUTA	12
	WAITHAKA	12
7.KASARANI	RUARAKA	12
	KAHAWA	13
8.WESTLANDS	KILIMANI	12
	PARKLANDS	12
TOTAL		<u>191 SCHOOLS</u>

(Source: City Education Department, 2002)

From the table above, Starehe Division has the highest number of primary schools with 31 followed by Embakasi whereas Lang'ata has the lowest, with only 14 schools. The actual total number of private schools was

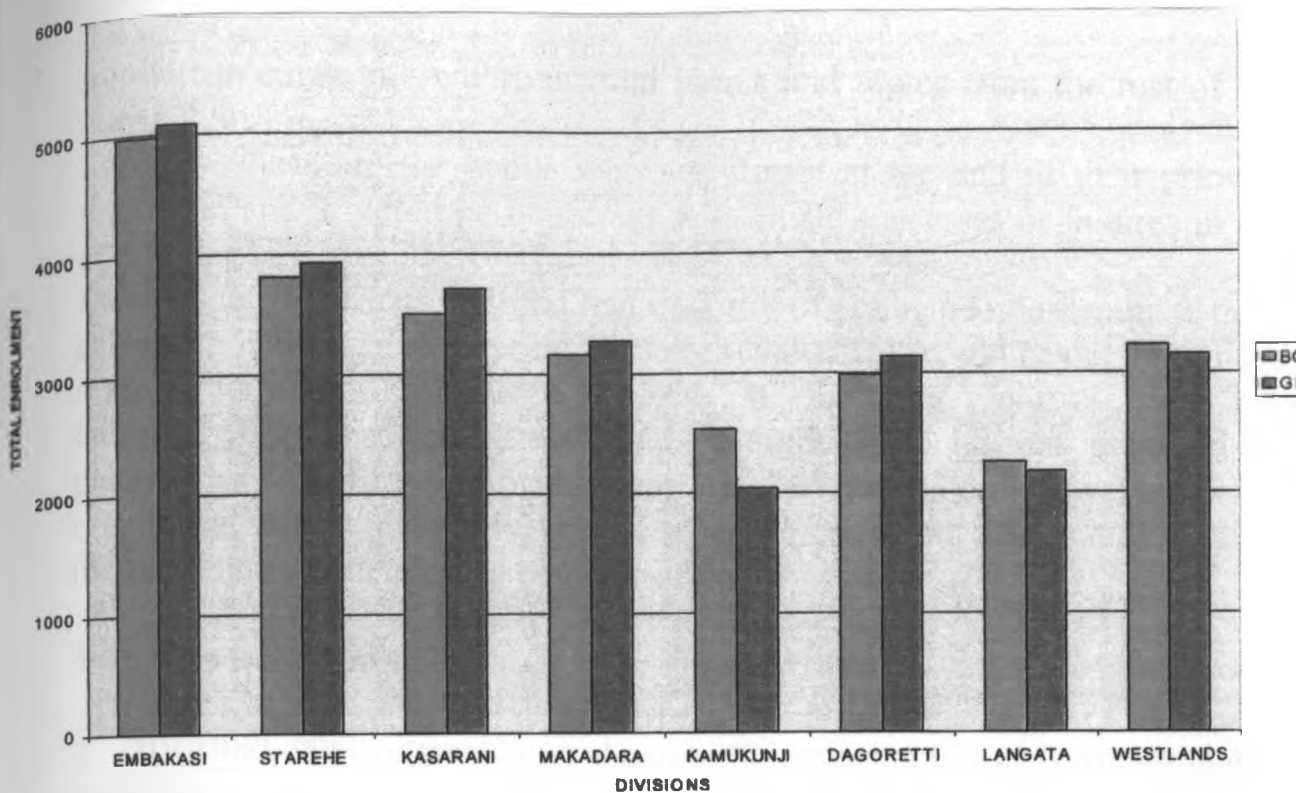
Fig 2.1 NAIROBI CITY: STUDENT ENROLMENT IN PUBLIC SCHOOLS



unavailable during this study. According to the Education Department, most schools operate as private business enterprises and may close anytime depending on profitability. Others fear registering with the department due to the possibility of being required to pay registration charges, taxes among other government requirements (Songole, 2002)

However, the total number of students in public schools was 154,024 pupils comprising of 77,538 boys and 76,486 girls. This figure reflects an almost balanced population in terms of gender. According to figure 2.1 above, Embakasi has the highest enrolment whereas Lang'ata has the lowest. In terms of zones, Kayole has the highest number of pupils whereas Nairobi west has the lowest

The total lands acreage in each school and the location of the school poses specific environmental problems for these schools. Usually, it is generally assumed that the higher the number of students in a school, the bigger should the total land area be. But in Nairobi, some areas have less land acreage devoted to schools whereas others have modestly enough land for schools. Due to shortage of land and competition from other uses such as housing, schools in Embakasi and the Central Business District (CBD) like Morrison, Heshima Road, and Dr. Krapf have acreage of less than 2 hectares with Khalsa, Bohra and Racecourse occupying less than 0.8 hectares despite the schools having 3 streams. This as mentioned earlier poses a problem to amounts of 'space' for conservation activities. Other schools face peculiar environmental problems due to the nature of their location. Schools in the CBD such as Khalsa, Racecourse (which are near transport foci), St. Peters Clavers and Moi Avenue are affected by noise from outside the school compound, (Owuor, 1989).



As mentioned above there is an almost 50-50 balance in pupils enrolment in terms of gender. However, girls outnumber boys in four out of the eight divisions as shown by figure 2.3 above. These are Dagoretti, Makadara, Starehe and Kasarani. This clearly shows that environmental programmes should be gender non-partisan. Research has shown that women are eager to involve themselves in activities that improve their communities. Grieser and Rawlings (2000) points that media campaigns being pre-tested should take gender issues into consideration. Female pupils, as it were, are an important part of the society and are the future women, hence the need to inculcate environmental virtues in their formative ages especially when they are in primary schools.

As earlier mentioned, this study focused on classes 6,7 and 8 in the city's primary schools. The total enrolment in these classes stands at 52,899 comprising of 26,429 boys and 26,470 girls. Figure 2.2 shows that Embakasi has the highest enrolment in these three classes with Kamukunji having the lowest.

This as well as the population of pupils in private schools comprises the study's population. A sample of 8 schools incorporating 5 public as well as 3 private schools was used. The schools were randomly selected from the eight divisions. 9 pupils were randomly selected in each school and required to answer some questions in a questionnaire. 2 teachers were also sampled from the 8 schools. The main reason for selecting classes 6,7 and 8 is that they can handle the questionnaires well with minimum guidance by the teachers. Secondly, these are the pupils who have gone through a relatively greater amount of environmental education since class 1. Thirdly EE topics are particularly introduced to pupils in the upper classes of primary education as opposed to the lower classes. This means that at this level most

pupils can single out environmental issues and topics from the rest of the curriculum.

Fourthly, these are the pupils who are almost at the end of their primary education and it would be important to evaluate successes or failures in EE at this stage.

Lastly, studies have established that majority of young people terminate their schooling at the age of 13 years, (Owuor, 1989). This could be due to limited opportunities in secondary schools. It therefore follows that the environmental knowledge, skills and attitudes a pupil has acquired at primary level will be significant, as it could be the only avenue there is for creating an environmentally knowledgeable population. Using an effective media of communication can enhance this.

Teachers in Nairobi city

By 1980, 99% of teachers in Nairobi public schools were professionally qualified compared to the national figure being 65%. There were 3008 teachers in total with a student –teacher ratio standing at 32:5. The total number of P1 teachers has been on the rise from 44% in 1979 to 51% in 1987. With a reduction of the least qualified P3 down to 4.3%. (Owuor, 1989) This means that with the current training trends in Kenya, most teachers may have gained environmental awareness.

By year 2003, the capacity in the teaching force is almost the same with a slight increase from a total of 4188 in 1988 to 4296 in the year 2000. (Nairobi City Council, 2002). This is despite the increase of student populations exerting pressure on the already overburdened facilities.

An interesting situation is that whereas male teachers are 605, female teachers are 3708 giving a male –female ratio of 1:6. This should be taken into consideration when designing EE programs, which should be gender sensitive in all areas including the timing of EE seminars.

Summary

This chapter outlines the physical, climatic and educational background that is essential in understanding the study area. The next chapter shows the study methods that were used.

Chapter 3

Research Methodology

3.0 INTRODUCTION

One of the key processes of research investigation involves the collection of data and its subsequent analysis in order to make conclusive statements. Some of these statements may be used to establish relationships between variables.(Kothari, 1990)

Data collected can be primary data or secondary data. Primary data is usually first-hand information collected by the researcher. Secondary data is usually obtained from published documents such as government annual reports, population census, maps and newspapers among other sources. Researchers also analyse data obtained with a view to obtaining information on trends, relationships and distributions. To accomplish all these tasks various methods are used.

This chapter outlines the methods that were used to collect, analyse and present the findings of both primary and secondary data.

3.1 Data sources

3.1.1 Primary Data

The source of data was basically pupils and teachers. These two groups of population form the basic users of EE and are in direct contact both as the target group in primary schools and being the implementers of the EE syllabus.

The primary data sources firstly provided information on most common formal and informal media that is available to, and utilised by both pupils and their teachers.

Secondly the sources were very important in providing information on pupils and teachers opinion on the most effective media resource in inculcating positive environmentally friendly behaviour.

Also, from the data sources, factors that affect access to and choice of various media were obtained and given various weights in order to find out the most important ones for the research.

3.1.2 Secondary Data

The main source of this data was the City Education Office. Also, the Ministry of Education and the Central Bureau of Statistics (CBS) provided some background statistics.

Other sources included maps, atlases and published projects, theses and dissertations.

However, much of the data obtained provided by these sources was useful in the background of the study only.

Photographs and brochures from some schools provided an insight into some of the media utilised in enhancing and encouraging environmental activities in particular schools.

3.2 Data collection methods

Most of the data collected for this study was obtained from primary sources using questionnaire method. This method was selected due to the shortage of time and resources. (See Appendix) Other methods that could have been used but were not include interviews and direct observation.

Two different questionnaires were designed-one for pupils and one for teachers. Both comprised open and closed questions. This was done in order to avoid collecting unnecessary information and to save time. A final autobiographical question was included to allow the pupils to provide unrestricted account of the personality with the most influence in their lives as far as environmental action is concerned.

A few inventories and grids within the questionnaire were also used for respondents to fill in, which proved to be an easier method of collecting qualitative data from both pupils and teachers. The secondary data collection method was simply extraction of data from brochures.

The questionnaires were administered to pupils using the group questionnaire method as shown in figure 3.0. To avoid bias, no communication was allowed between the pupils. The researcher remained in the room in order to answer any questions raised by the respondents or clarify on unclear points. The same procedure was also adopted for the teachers.



Fig. 3.0

Conducting a group questionnaire session at Loreto Convent Msongari on 1st October, 2002

3.3 Sampling

3.3.1 Sampling of pupils

A sample of 72 pupils and 16 teachers was randomly selected from a population comprised of all public schools as well as private primary schools from various divisions registered at the Nairobi City Education Department. To avoid bias, the population was divided into strata of public and private schools, teachers and pupils, as well as streams in class 6,7 and 8. This method was therefore stratified random sampling. A total of 5 public primary schools and 3 private primary schools in different geographical areas were selected randomly from the city's eight divisions shown in map 4. This was done by the lottery method, with numbered pieces of paper representing schools put in a basket, mixed thoroughly and then drawn. More public schools than private schools were selected. This is because the population of the City's public schools is generally higher than private schools.

Public schools in this study were also useful because normal Kenyan schools would be more statistically acceptable in applying the sample statistics to conclusions of the media of environmental education for the actual Kenyan situation. However, for purposes of comparison, it was necessary to find out the situation of media used in EE in private schools.

Respondents were selected from school populations in the selected schools from each of class 6, 7 and 8 as well as within population in each class and stream. Three pupils were randomly selected in each of the class 6,7 and 8 giving a total of nine pupils. The lottery method as described above was used. Use of class registers in which pupils are usually allocated numbers (e.g. number 1 for first named student and say, 30 for last to be listed student) proved easy and saved on time. In situations of double or triple streams, each stream was given a chance in selection of members of the sample.

3.3.2 Sampling of teachers

Two teachers were randomly selected from each of the eight schools, using the same lottery method as explained above. Only teachers who were handling class 6, 7 and/or 8 at the time of the study were selected. The choice of the two teachers was because the study assumed that there is a normal distribution in the city's teaching force in terms of professional qualifications or training and environmental interest among the target

teachers. Hence the sample of two teachers for each school was taken as representative of all teachers in Nairobi City who teach the three upper primary classes.

However, the sample was largely affected by lack of resources. Basically all eight divisions should have been selected as strata for a much comprehensive sample. But due to limited time and budgetary constraints led the researcher to use a smaller sample but which however maintained strict controls to eliminate any bias and ensure valid results. Also bureaucracy by school heads in accessing teachers and pupils was a problem in a few of the schools. In spite of these limitations, the researcher feels that the overall sample was representative of the population targeted.

3.4 Data analysis

Both qualitative and quantitative methods of data analysis were applied. The information from the questionnaires was summarised in tables of frequencies. This was based on most commonly used media, most effective media as obtained from both pupils and teachers.

The calculated percentages were then ranked to show the variations of the variables named above. Based on the ranking, the Spearman's Rank Correlation Coefficient (Spearman's rho) was calculated to show the relationship between the media mostly used by teachers and the one most preferred by pupils. The following formula was used:

$$R_s = \frac{1 - 6 \sum d^2}{n(n^2 - 1)}$$

Where: R_s is the Spearman's Rank correlation coefficient,

1 is a constant

6 is a constant

$\sum d^2$ is summation of the square of the rank's differences,

n is the number of the media in the sample

Part of this study focus is on the most effective media, and because the most effective media to teachers may be different from pupils', use of ranked data was essential. In examining the relationship between the two variations, the Spearman's Ranked correlation coefficient was selected as an efficient method because it makes use of ranks.

The coefficient obtained is discussed in Chapter 4.

To obtain the factors affecting the choice of any given media, teachers and pupils responses were tallied and the frequencies for each school combined. The media with the highest frequency was selected and noted down. This was done for all factors and the results combined to show the overall pattern. The main factors were selected from the ones that obtained the highest frequencies. The results are outlined in the next chapter.

3.5 Data presentation

Tables, graphs, pie charts and bar graphs were used to show the commonly used media and also the most effective media.

Also descriptive qualitative analysis has also been used to show the factors affecting choice of media.

The results from the data analysis and various findings are discussed in the next chapter.

CHAPTER FOUR

DATA ANALYSIS AND RESEARCH FINDINGS

4.0. Introduction

As stated earlier, this study relied on stratified random sampling method for data collection. Out of a sample of 90 selected respondents questionnaires were administered to 72 pupils and 18 teachers. Both public and private primary schools were taken into consideration. Six public primary schools and three private primary schools were randomly selected. In each school 9 pupils were randomly selected in classes 6, 7 and 8. Overall, each of the three classes contributed three pupils to the sample. 69 pupils' and 15 teachers' questionnaires were filled. There was a return rate of 96% and 83% for pupils and teachers respectively.

4.1 Sample characteristics

Table 4.0 shows the distribution of the sampled teachers based on subject(s) taught.

Table 4.0 Subject distribution for teachers in sample

Subject	Number of teachers
GHC	8
Swahili	2
Agriculture	2
Science	8
Mathematics	4
English	2
Christian Religion Education	2
Art/Craft	1
Physical Education (P.E)	1

(Source: Researcher, 2002)

It is important to note that one teacher can teach several subjects at the same or different levels in the same year. From Figure 4.0, majority of the teachers were teaching Geography, History and Civics (GHC) and Science.

Table 4.1 and figure 4.0 shows the teacher distribution in classes and pupils' distribution by age.

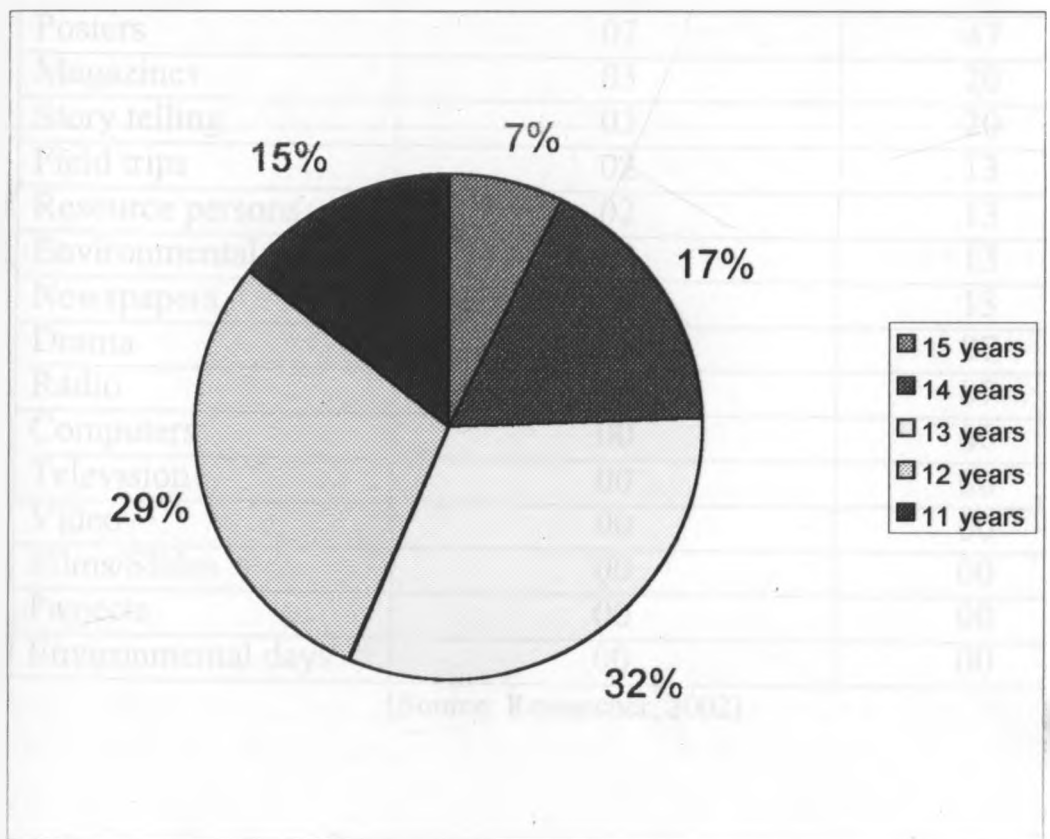
Table 4.1 Class distribution for teachers in sample.

Class	Number of teachers
6	9
7	14
8	11

(Source: Researcher, 2002)

From table 4.1 majority of the teachers in the sample taught class 7, although it is normally possible for one teacher to handle more than one class.

Figure 4.0 Pie graph showing age of pupils in sample.



(Source: Researcher, 2002)

Figure 4.0 shows that majority of the pupils were aged 13 years and below. Pupils aged 14 years and above constituted a quarter or about 25% of the sample.

4.2 Most common media used

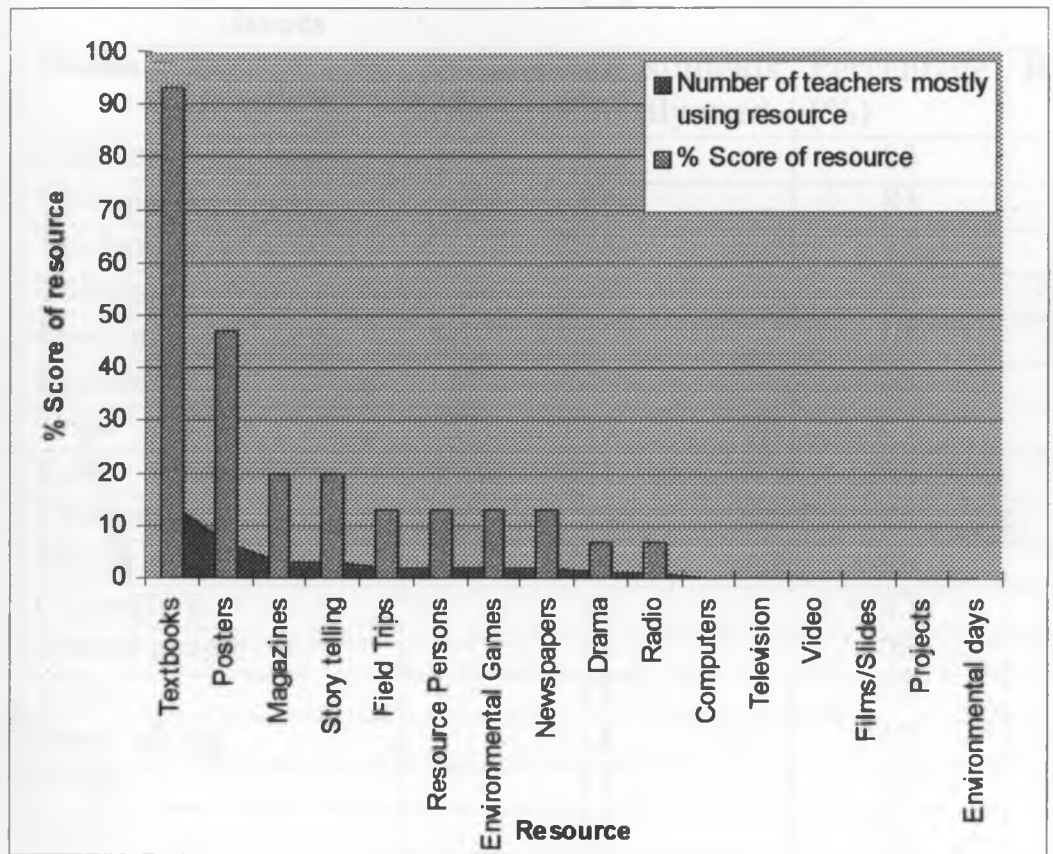
The following graph shows the common media mostly used by the sampled teachers in communicating environmental knowledge.

Table 4.2 Media mostly used by teachers in environmental education topics.

Media	Number of teachers using media resource	% Score of resource
Textbooks	14	93
Posters	07	47
Magazines	03	20
Story telling	03	20
Field trips	02	13
Resource persons	02	13
Environmental games	02	13
Newspapers	02	13
Drama	01	07
Radio	01	07
Computers	00	00
Television	00	00
Video	00	00
Films/Slides	00	00
Projects	00	00
Environmental days	00	00

(Source: Researcher, 2002)

Figure 4.1 Bar Graphs showing media used by teachers



(Source: Researcher, 2002)

Figure 4.1 shows the resources used by teachers in communicating environmental knowledge.

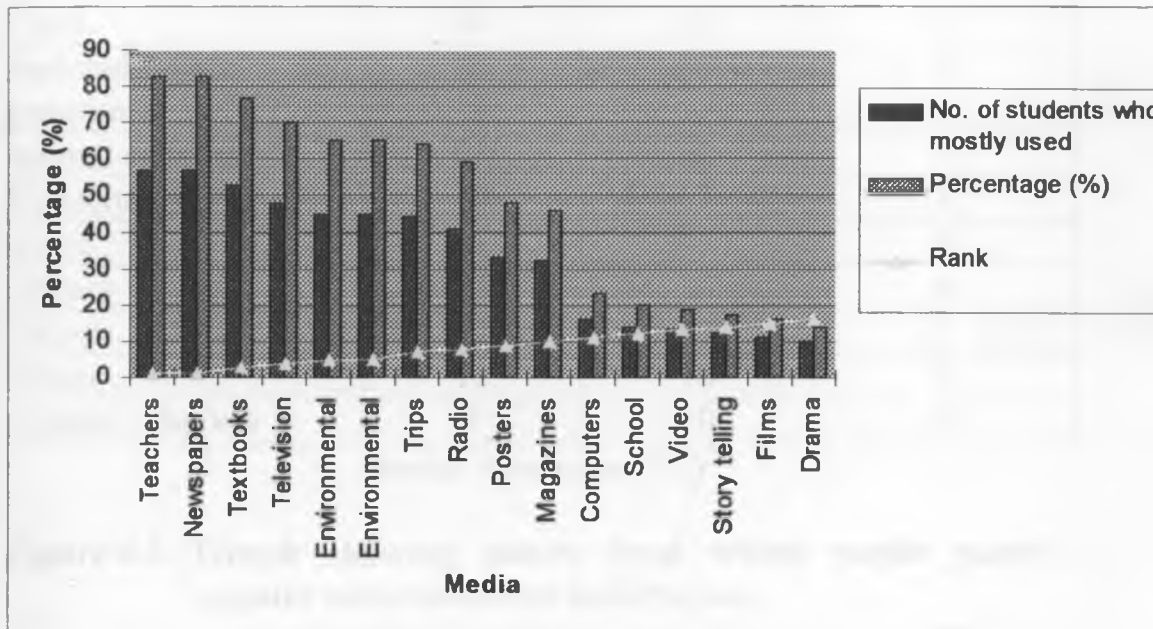
Teachers mostly use textbooks (93% score) with other media shown in the table scoring significantly lower values. Formal media clearly dominates whereas informal media such as field trips, environmental games, and drama and projects seem to be rarely used. Electronic media such as radio, computers, television, video and films are rarely used in schools. It is noteworthy to note that pupils seem to have access to media that teachers do not. This includes computers, television, video, films and environmental days. The reason could be access to media outside their schools possibly due to the home environment or the possible role of parents in accessing such media.

Table 4.3: Media mostly used by pupils in learning environmental issues

Media	Number of students who have mostly used	Percentage (%)	Rank
Teachers	57	83	1
Newspapers	57	83	1
Textbooks	53	77	3
Television	48	70	4
Environmental days	45	65	5
Environmental Games	45	65	5
Trips	44	64	7
Radio	41	59	8
Posters	33	48	9
Magazines	32	46	10
Computers	16	23	11
School guests	14	20	12
Video	13	19	13
Story telling	12	17	14
Films	11	16	15
Drama	10	14	16

(Source: Researcher, 2002)

Figure 4.2 Media most commonly used by pupils in learning environmental issues.



(Source: Researcher, 2002)

Figure 4.2 shows that pupils use formal media i.e. classroom teaching and textbooks whereas newspapers are an important source of environmental information. The electronic media seems to be available to pupils especially considering that a significant number obtain environmental information at home as also shown in figure 4.3

Table 4.4 Media resource (and school) through which pupils have acquired environmental knowledge

School	Media Resource
Busara	Teachers, Television
Madaraka	Trips
Belle View	Newspapers, Environmental days
Thika Road	Newspapers, teachers, trips
Thika Road Xtn	Newspapers, books
Moi forces	Teachers
Muthangari	Radio, newspapers, books, teachers
L.C. Msongari	Newspapers, books, trips, environmental days

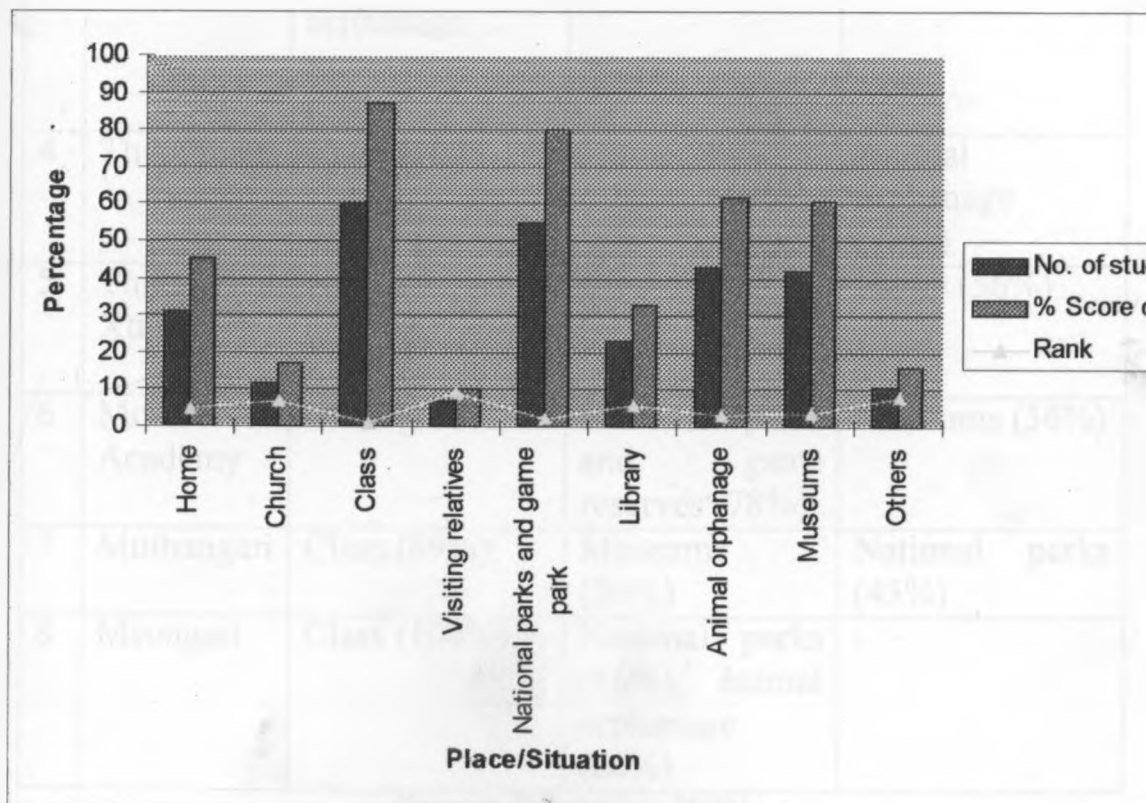
(Source: Researcher 2002)

Table 4.5 Places from which pupils mostly acquire environmental information

Place/Situation	Number of students	% Score of total	Rank
Class	60	87	1
National parks and game park	55	80	2
Animal orphanage	43	62	3
Museums	42	61	4
Home	31	45	5
Library	23	33	6
Church	12	17	7
Others	11	16	8
Visiting relatives	7	10	9

(Source: Researcher 2002)

Figure 4.3 Graph showing places from which pupils mostly acquire environmental information.



(Source: Researcher, 2002)

The figure clearly shows that formal activities in class are pupil's most important source of environmental information. They also consider out-of-class or informal sources such as National Parks, Game reserves, animal orphanages and museums to be vital places for acquiring environmental information.

Table 4.6 Top 3 places from which pupils obtain environmental information.

	School	Rank 1	Rank 2	Rank 3
1	Busara	Class (100%)	National parks and Game Reserves 89%	Animal orphanage (78%)
2	Madaraka	National parks and game reserves (89%)	Class (78%)	Animal orphanage (67%)
3	Belle View Academy	National parks and game reserves, animal orphanage, museums (78%)	Class (67%)	-
4	Thika road	Class (100%)	Home (89%)	Animal orphanage (78%)
5	Thika road Xtian	National parks and game reserves (78%)	Class (67%)	Home (56%)
6	Moi Forces Academy	Class (100%)	National parks and game reserves (78%)	Museums (56%)
7	Muthangari	Class (89%)	Museums (56%)	National parks (45%)
8	Msongari	Class (100%)	National parks (56%), animal orphanage (56%)	-

(Source: Researcher, 2002)

4.3 Availability of Media

Table 4.7 below shows that various media resources can be available to teachers and pupils even though they are not being utilised. For example resource persons, school field trips, magazines and newspapers are available albeit with very low or no utilisation at all compared to textbooks.

Table 4.7 Media availability in schools

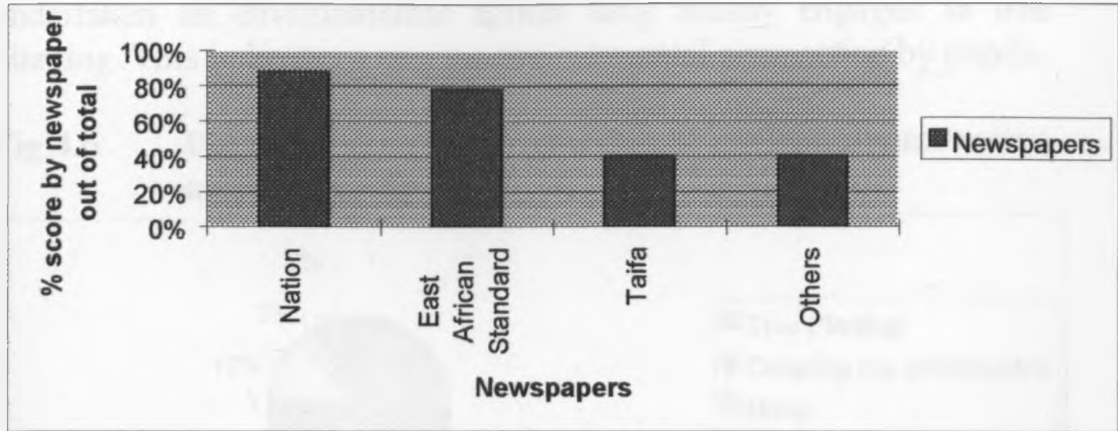
Media Resource type	Available	Not available
Computers	04	11
Radio	07	08
Magazines	11	04
Television	07	08
Video	07	08
Field trips	15	00
Resource persons	12	03
Films	02	13
Textbooks	13	02
Newspapers	12	03
Drama	07	08
Environmental games	05	10
Posters	11	04
Story telling	08	07

(Source: Researcher, 2002)

Newspapers

It was found out that 97% of the pupils have ever read a newspaper. Nation and East African Standard newspapers score highly in having environmental articles ever read by pupils as shown in figure 4.4.

Figure 4.4 Newspapers with environmental articles read by pupils.



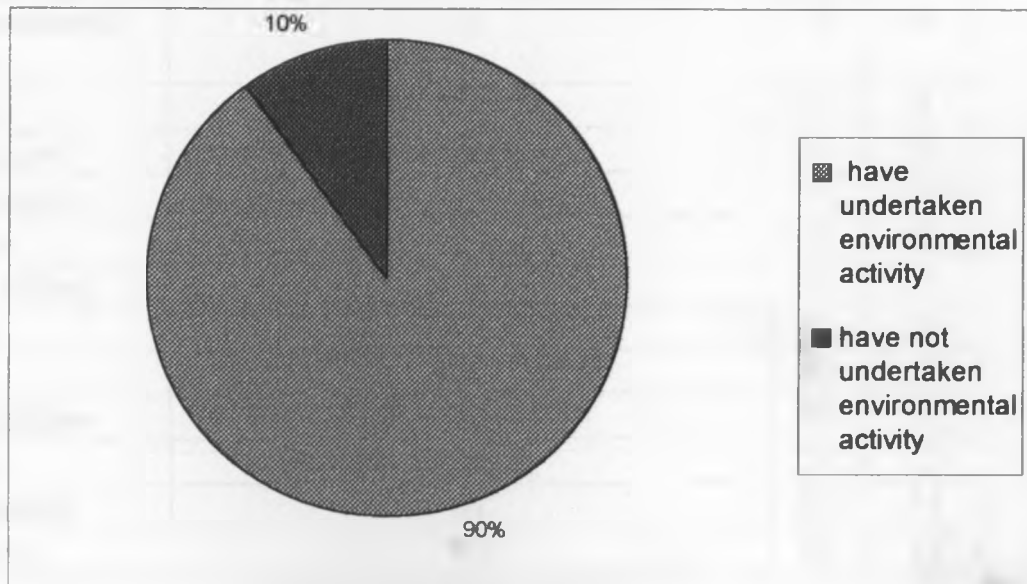
(Source: Researcher, 2002)

The scores indicate strong linkages between pupils' environmental education and the various Nairobi media newspapers. In this regard, schools would benefit more from print media by utilising more newspapers in enhancing environmental education.

4.4 Most effective media

According to this study, 62 pupils out of the 69 sampled were found to have ever undertaken environmental activity. Figure 4.5 shows that 90% of pupils have undertaken an environmental activity whereas 10% have not.

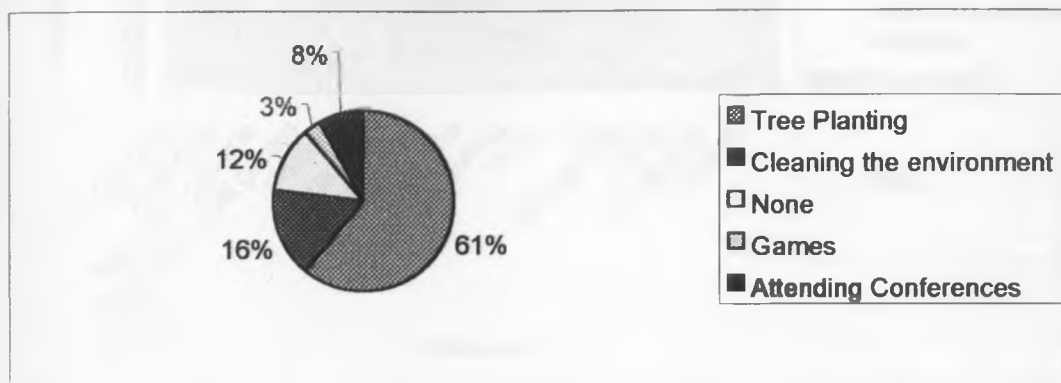
Figure 4.5 Pie chart showing % of pupils who have ever undertaken an environmental activity.



(Source: Researcher, 2002)

Figure 4.6 below shows that majority of the pupils who have undertaken an environmental action have mostly engaged in tree planting. This indicates a narrow environmental perspective by pupils.

Fig 4.6 Pie chart showing proportion of environmental action undertaken by pupils.



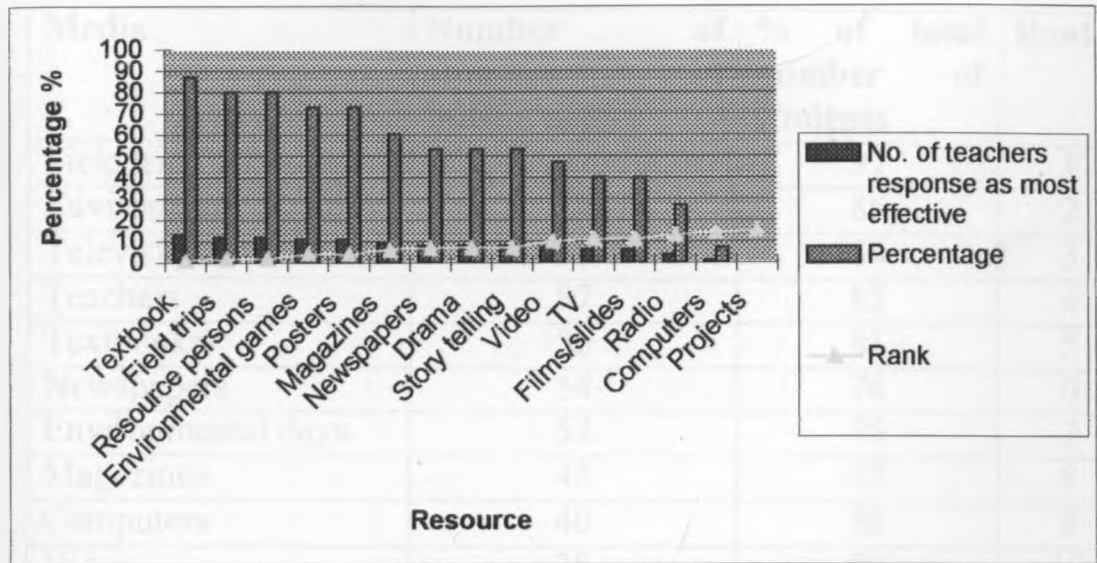
(Source: Researcher, 2002)

Table 4.8 Media considered by teachers as most effective

Media Resource	Number of teachers response as most effective (out of 15 respondents)	%	Rank
Textbooks	13	87	1
Field Trips	12	80	2
Resource persons	12	80	2
Environmental games	11	73	4
Posters	11	73	4
Magazines	09	60	6
Newspapers	08	53	7
Drama	08	53	7
Story telling	08	53	7
Video	07	47	10
TV	06	40	11
Films/slides	06	40	11
Radio	04	27	13
Computers	01	07	14
Projects	00	00	15

(Source: Researcher, 2002)

Figure 4.7 Bar Graph showing media considered by teachers to be most effective



(Source: Researcher, 2002)

Teachers view formal media (textbooks) as the most effective method of imparting environmental knowledge. This is closely followed by informal media such as field trips, resource persons and environmental games. It is important to therefore enhance EE through textbooks which are the most effective as shown in figure 4.7.

Electronic media is observed to score poorly as a tool of effective EE learning. Environmental projects are also seen as not effective.

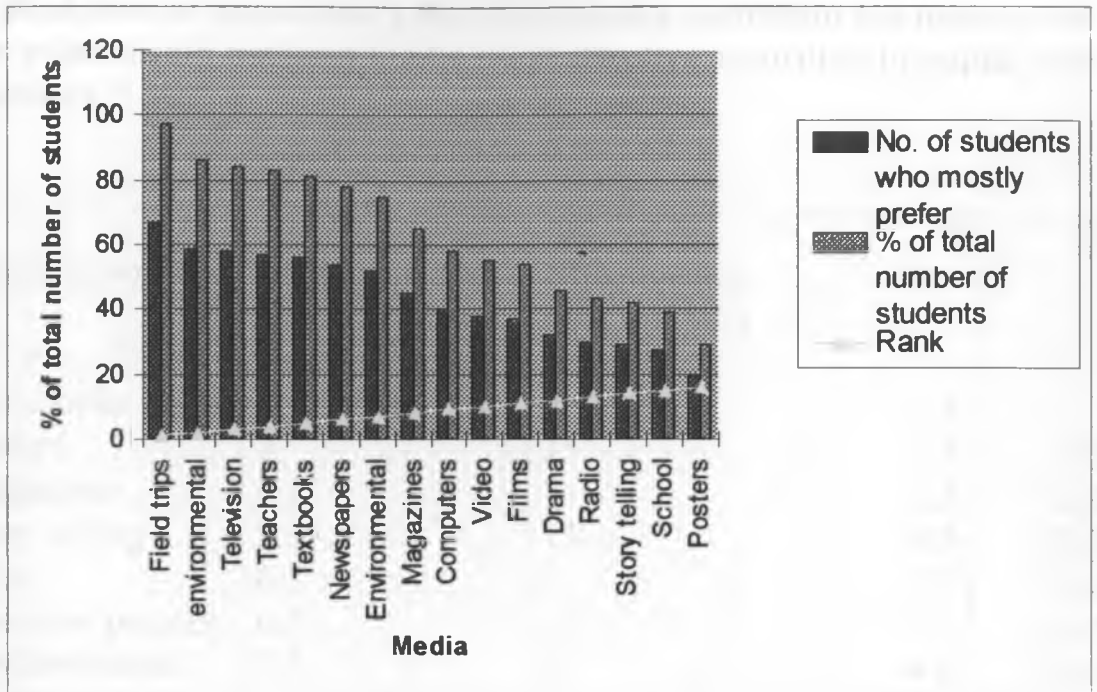
Figure 4.8 shows the most preferred media by pupils in encouraging environmentally friendly behaviours. High scores are also reflected by informal media such as field trips as well as environmental games. It is also important to note from table 4.9 and figure 4.8 that pupils do not rate resource persons and posters highly. However, textbooks scored highly while teachers as a media score also quite highly.

Table 4.9 Media preference by pupils in encouraging action

Media	Number of students who mostly prefer	% of total number of students	Rank
Field trips	67	97	1
Environmental games	59	86	2
Television	58	84	3
Teachers	57	83	4
Textbooks	56	81	5
Newspapers	54	78	6
Environmental days	52	75	7
Magazines	45	65	8
Computers	40	58	9
Video	38	55	10
Films	37	54	11
Drama	32	46	12
Radio	30	43	13
Story telling	29	42	14
School guests	27	39	15
Posters	20	29	16

(Source: Researcher, 2002)

Figure 4.8 Media preferred by pupils as most effective



The ranked scores obtained from the data on media used by teachers (Table 4.2) were correlated with the ranked data on media preferred by pupils (Table 4.9). The spearman's Rank correlation Coefficient was calculated. (Table 4.10) A coefficient of -0.168 was obtained. This indicates a very low negative relationship.

Table 4.10

Calculation of Spearman's Rho correlation coefficient for finding out the relationship between media most effective according to pupils and teachers *.

<u>Media Resource</u>	R1 Media mostly used (Teachers)	R2 Effectiveness rank (pupils)	d	d ²
Text books	1	4	-3	9
Posters	2	15	-13	169
Magazines	3.5	7	-3.5	12.25
Story telling	3.5	13	-9.5	90.25
Trips	6.5	1	5.5	30.25
Resource persons	6.5	14	-7.5	56.25
Environmental games	6.5	2	4.5	20.25
Newspapers	6.5	5	1.5	2.25
Drama	10.5	11	-0.5	0.25
Radio	10.5	12	-1.5	2.25
Computers	14	8	6	36
Television	14	3	11	121
Video	14	9	05	25
Films	14	10	04	16
Environment days	14	6	08	64
	n=15			∑d ² =654

* Teachers and projects as media were not taken into consideration.

$$P_s = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

$$= 1 - \frac{3924}{3360}$$

$$= -0.168 \text{ very low negative relationship.}$$

Table 4.11 Resource preferred most by pupils

School	Rank 1	Rank 2	Rank 3
Busara	❖ Environmental games ❖ Trips	Environmental days	-
Madaraka	❖ Environmental games ❖ Trips	Environmental days	-
Belle View	❖ Television ❖ Trips	Environmental games	-
Thika road	❖ Newspapers ❖ Environmental games	Trips	-
Thika road Christian	❖ Television	Trips Environmental days	-
Moi Forces Academy	❖ Textbooks ❖ Trips	Environmental days	-
Muthangari	❖ Trips ❖ Teachers	Newspapers	-
Loreto Convent Msongari	❖ Environmental games ❖ Trips	Environmental days	-

(Source: Researcher, 2002)

4.5 Personality Media

Personalities are effective and efficient media used in communicating environmental education and encouraging environmental actions as shown in Table 4.12.

Table 4.12 Personalities who have encouraged environmental action according to pupils

Personality	No. of pupils influenced/encouraged	%
Parents	8	11.6
Relatives	5	07.2
Teachers	39	56.5
Environmentalists	08	11.6
Friends	03	04.3
Others	06	08.7
Total	69	100



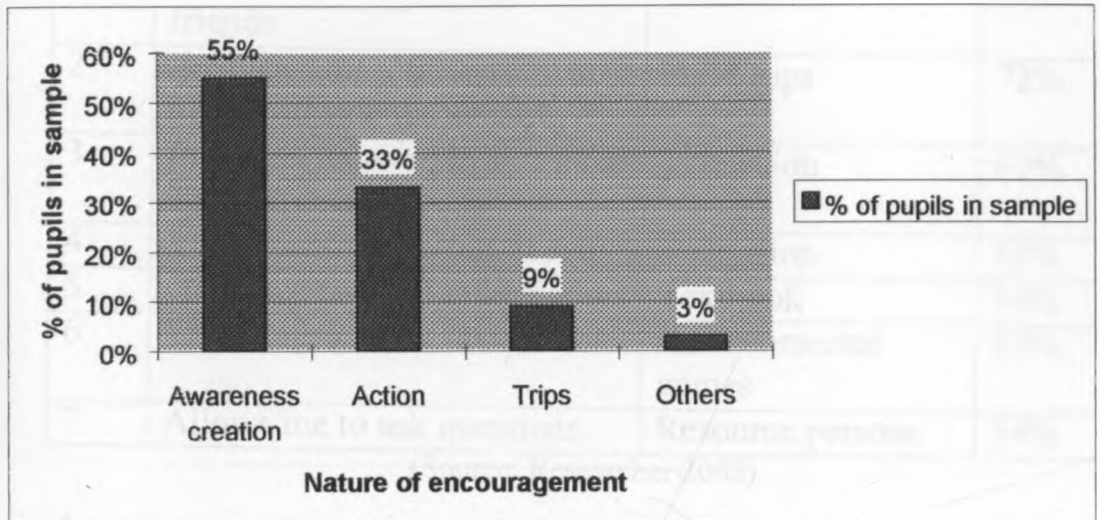
Fig. 4.9 'Environmental games' held at Loreto Convent Msongari in 2001: Fun and building physical fitness. Events were physical with no visible environmental oriented activity. Photograph, Researcher, 2002.



Fig. 4.10 Year 2002 'Environmental games'. Involvement of pupils, private companies and parents was key to success. Photo source, Researcher, 2002.

However the role of the personalities in inspiring environmental action to pupils has mainly been through creation of awareness as shown in figure 4.11.

Figure 4.11 Bar chart showing nature of encouragement gained by pupils through various personalities



(Source: Researcher, 2002)

4.6 Factors affecting choice and access to media

Through the use of a grid, the study sought to identify and rank the factors that affect the media used in environmental education. Pupils and teachers identified various factors and tried to match or link them with the various media types. For each school, pupils tally for various media for each factor were combined to select the media with the highest tally for each suggested factor, and the media was noted in the appropriate box for each school. This procedure was repeated for all eight schools. Only the media with the highest tally was selected for each factor and from each school.

After combining the different media for all the schools and their scores, the total number of pupils and teachers was used to calculate the total percentage score for each factor (Table 4.13) By comparing the percentage scores for each factor, the most important factors can be identified based on their corresponding media. A score of 50% was arbitrarily chosen to be the most important point for selection. This was because 50% is the average of the pupils sampled. Any factor identified by 50% or more pupils was regarded as important.

Table 4.13 Factors selected by students, the relevant media type and the score for each factor

S/no	Factor	Most common media	Factor score
1	Enables me to make new friends	Field trip	68%
2	Enables me to visit new places outside the school	Field trips	72%
3	Enables me to learn more about my country	Television	61%
4	Very entertaining/full of fun	Television	55%
5	Gives me truthful information	Textbook	54%
6	Encourages me to take action	Environmental games	55%
7	Allows me to ask questions	Resource persons	54%

(Source: Researcher 2002)

Other factors scoring below 50% were dropped because their scores were considered below average. However, it is important to note that although scoring lowly on the average, some of the factors could be important to some schools or pupils. This is in spite of their scoring below average when worked for the total number of pupils and teachers.

Table 4.14 Factors selected by teachers, their scores and most common media selected for each

	Common media selected	factor	Score
1	Textbooks	Easily available	47%
2	Magazines	Cheap to obtain	33%
3	Textbooks	Easy to use	53%
4	Textbooks	Easy to access	60%
5	Field trips	Very effective	53%

S/no.	Factor	Common media selected	Score
6	Field trips and textbooks	Easy to use with many students	47%
7	Textbooks	Learners obtain a lot of information	47%
8	Field trips	Truthful source of information	47%
9	Textbooks	Media in enough quantities	40%
10	Textbooks	Readily accessible in school community	53%
11	Field trips	Has a lot of parental support	73%
12	Field trips	Very interesting to students	87%

(Source: Researcher, 2002)

A grid analyses for resources not commonly are in Table 4.15.

Table 4.15 Scores for all media resources not commonly utilised

S/no	Factor for media not mostly utilised	% of response
1	Lack of enough time	67
2	Resource not available	60
3	Resources in inadequate quantities	53
4	Overcrowded curriculum	67

(Source: Researcher, 2002)

It is clear from the teacher's responses that some factors are of more importance than others. Also most teachers are not bothered by cost of any media used or not used most likely due to the fact that they may not be consulted in budgetary issues in their schools.

4.7 **Summary**

This section has shown the research findings as far as the study objectives are concerned. The next chapter summarises the study with some recommendations and areas which future researchers may take into consideration.

Chapter Five

Summary and Conclusions

5.0 Introduction

This study has attempted to establish the most common and most effective media used in environmental education in Nairobi City. The focus of study was on eight primary schools with classes 6, 7, and 8 pupils and two teachers from each school forming the sample. Also attempts at establishing factors affecting choice and access to various media were undertaken. As explained in chapters three and four, the questionnaire method was mostly used together with interviews thus providing primary data. Also secondary data was utilized. The results of the data analysis have been outlined in chapter 4.

The following section summarizes the findings and conclusions and subsequently, relevant recommendations related to this study..

5.1 Summary of findings

The first study objective stated in chapter 1 is on determining the most common media used in communicating environmental education concepts in primary schools in Nairobi City.

From the data analysis, it was found out that 93% of teachers use textbooks as their main media of communication. This was ranked as number one. Rank 2 was posters with only 47% of teachers using it as the media of communication.

83% of pupils identified teachers and newspapers as their main sources of environmental information. Textbooks, identified by 77% with television identified by 70% of the pupils closely followed this.

Therefore, there is a common media used in communicating environmental education concepts. For teachers, it is the textbook. For pupils the teacher is their main medium.

The second objective in the study was to establish the most effective of the various types of media used in communicating EE knowledge. From the data analysis, teachers identified the most effective media as textbooks, (87% of subjects) closely followed by field trips and resources persons (both with 80% of subjects)

Pupils identified field trips (97% of subjects) closely followed by environmental games (86% of subjects), television, teachers, and textbooks (84%, 83% and 81% of subjects respectively).

Thus, from this study, there are differences in the effectiveness of the various types of media used in primary schools in Nairobi City. Teachers insist on textbooks whereas pupils' most effective media is outdoors or field trips.

The third objective was to assess the factors affecting the choice of and access to media used in Nairobi primary schools, in communicating environmental education concepts. The grid analyses showed various factors as identified by more than 50% of pupils and teachers in schools as affecting their choice and access to various media. For example, 72% of pupils stated that field trips enabled them to visit new places outside school and 68% chose field trips as enabling them to make new friends. 83% of teachers selected field trips due to the fact that they are very interesting to pupils and chose textbooks for a number of factors some of which include easy access, being readily accessible in the school community and easy to use. Hence, this study establishes that there are various factors affecting media choice and access according to both pupils and teachers.

5.2 Conclusion and recommendation

The following conclusions and recommendations require to be pointed out in regard to teaching of environmental education.

5.3.1 Curriculum developers

For both teachers and pupils, the most common media of imparting EE is formal or school-based. Teachers consider textbooks and posters as most effective whereas pupils identify the teachers as their main media source of EE. Therefore, curriculum developers should aim at developing textbooks that enhance inclusion of activities or projects in learning. They should also

ensure that textbooks promote sustainability in utilization of natural resources. This is because of the fact that it has been found out that teachers mostly use textbooks as their main resource in EE. Policies aimed at preparing the teacher adequately to teach EE effectively need be put in place, since they are the most common media to pupils. Capacity building should be encouraged for teachers so as to enable them to adopt a mix of media, particularly moving away from ‘textbook-only- teacher’ to ‘outdoor - textbook– teacher’ as shown in figure 5.0, 5.1 and 5.2.

5.3.2 Teachers

Pupils mostly obtain environmental information from different places – mass media, game parks and reserves, orphanages and even at home. This requires teachers to be empowered to use the above outdoor activities (plate 4 and 5.)

Barker, et, al (2002) states that

“Never before has there been so much talk of education about sustainability, about bio-diversity. All these remain a ‘pie in the sky’ unless every pupil has an entitlement to extend his or her study of science out of the classroom”

The statement is reinforced by findings from this study that whereas teachers consider textbooks as the most effective media of communication in EE, pupils on the other hand consider field trips and environmental games as most effective. Palmer and Neal (1994) indicate “if environmental education is about producing well informed and environmentally active citizens of tomorrow, presumably those responsible for it should have some idea of the kinds of learning experiences which help to influence the development of environmental care and concern”

5.3.3 Mass media

From this study, 97% of sampled pupils had read a newspaper. Nation and East African Standard were the newspapers with most environmental articles. Print media should therefore increase the action-oriented environmental articles and create linkages with educational institutions. This may include awarding prizes to pupils who excel in environmental essays



Fig. 5.0 A green primary school with neat lawns and trees. Most schools do not encourage “green lifestyles” from an early age (Primary School age).
Photo Researcher, 2002



Fig. 5.1 A stream passing through Loreto Primary School.



Fig 5.2 A small forest near the same school.

Such natural facilities can be utilized in carrying out simple, suitable, useful and cost effective outdoor projects to complement tree planting activities in schools. Source: Photograph from Loreto Msongari Environmental Action Brochure, 2002.

and going further to publish the essays. They may also award prizes to journalists who excel in articles encouraging environmentally friendly actions to pupils. Radio stations should increase programmes that support friendly behaviors towards the environment. This will also boost chances of future journalists being environmentally conscious.

5.3.4 To Parents

From this study 56.5% of the pupils identified teachers as the personalities who have mostly encouraged them to undertake environmentally friendly action. Parents and environmentalists were identified by 11.6% of the subjects. A lot of parental involvement should be encouraged so that it reinforces the information gained from classroom. Resource persons should supplement this. This will enable environmental education to adopt an open or systems approach with parents, teachers, environmentalists and others all being vital components linked in EE. The conclusion here is that EE must move out of class to the community in which a school exists.

5.3.5 Ministry of Education

For EE to get more support from teachers, the issue of time allocation needs to be re-examined. Teachers cited lack of enough time and overcrowded curriculum as factors reducing access and use of certain media such as fieldtrips. It is the researcher's view that if it is the aim of EE to produce positive and environmentally friendly actions; perhaps it might be worth considering EE in our school syllabus. The end effects will justify the costs of this process.

Indeed the UN has declared the years 2005 to 2015 the decade for education and sustainability which points to the need for efficient educational pedagogical practices and participation by all sectors to make education achieve that noble goal.

5.4 Recommendations for further research.

The following recommendations arise from findings from this study as well as issues related to the study. It is hoped that the findings will be of benefit to policy makers, researchers and EE enthusiasts not only in Kenya but also

in East Africa and developing countries in general. The following areas need to be researched fully.

Curriculum developers

1. Levels of teacher training in EE and effect on creation of environmentally friendly behavior in pupils.
2. Textbooks as EE media resource and their role in development of environmentally friendly behaviour.
3. Effects of parent's participation in creation of environmentally friendly behaviour in pupils.

Teachers of environmental education.

1. Diversified activities by pupils complementing awareness creation in enhancing environmentally friendly behaviour.
2. Effect of pupils participation in choice of media used in EE

Mass media

1. Role of mass media in EE

Environmental Education Policy makers.

1. Impact of teaching EE as a subject in the Kenyan educational system.
2. Role of harmonized environmental policies in all sectors in creation of environmental friendly behavior in school pupils.

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APPENDIX

List of professionals and personnel interviewed.

<u>Name</u>	<u>Status/ position held</u>	<u>Date</u>
1. Mr. Omwoyo F.	Media and Resources Officer, KIE, Nairobi	15 th may 2002
2. Mrs Otieno, Dorcas	Chairperson ,Socio-Cultural Department, Faculty of Environmental Studies, Kenyatta University Nairobi.	12 th Jan.2002
3. Mr Songole	Chief Advisor of Schools, City Education Department, Nairobi.	2 nd August 2002.
4. Dr Wamicha	Dean, Faculty of Environmental Studies Kenyatta University	June 17 2002
5 Mr Ayub Macharia	Education Officer, National Museums of Kenya, Nairobi.	July 03 2002
6. Dr Abate Augusta	Programme Co-ordinator 'Savanna Lifestyles' A FAO/UNEP sponsored project involving a new environmental education textbook.	July 03 2002
8. Benson Murgor	Inspector of schools in-charge of environmental education, Ministry of Education, Jogoo House, Nairobi.	August 18 th 2002

9 Mwangi Ndaini, Environmental education December,20,2002
Co-ordinator, Msongari School
Environment Club, P.O. Box
30258, Nairobi.

PUPILS QUESTIONNAIRE

Dear pupil,

Please answer the following questions to the best of your knowledge.

1. Class _____ Age _____

2. What do you consider to be the meaning of the word 'environment'?

3. Write the following in full. (For example GOK – Government of Kenya).

UN _____

UNEP _____

KWS _____

WCK _____

KIE _____

FAO _____

4. Explain briefly what are the causes the following problems in the world.

Pollution

Soil erosion

Global warming

Ozone Depletion

5. The following table shows some environmental problems in Nairobi. Tick for each one, the level to which you consider as important/serious.

Problem	Very serious (5)	Serious (4)	Average (3)	A minor problem (2)
Flooding				
Lightning				
Traffic jams				
Water pollution				
Air pollution				
Noise pollution				
Ozone Depletion				
Garbage				
Global warming				
Deforestation				
Soil Erosion				
Famine / starvation				

6. We learn about our environment when we listen, read or talk about it in different places. Tick the places where you obtain information about the environment.

Place	Always (5)	Mostly (4)	Sometimes (3)	A little (2)
At home				
In the Church				
In class				
Visiting relatives				
National parks and reserves				
School library				
Animal orphanage				
Friends				
Museums				
Others (specify)				

8. Different students in primary schools learn about the environment through different ways. From the following table tick the way or ways through which have learnt about the environment.

	Always (5)	Most of the time (4)	Sometimes 3)	Very few times(2)
Drama				
Radio				
Newspapers				
Video				
Environmental games				
Posters				
Books				
Magazines				
Teachers				
Computers				
Television				
School guests / visitors				
Story telling				
Trips				
Films				

9. Do you read newspapers?

Yes _____ No _____

If Yes, list the newspapers from which you have read news about the environment.

10. Some of the ways in which we learn about our environment are better than others. Tick those ones you prefer most.

	I like very much (5)	I like (4)	Okay(average) (3)	I don't prefer (2)	I do not (1)
Radio					
Newspapers					
Television					
Environmental films					
Centers					
Books					
Magazines					
Computers					
Television					
School visitors					
Class teaching					
Textbooks					
School trips					
Films					
Drama					
Story telling					

11. Have you ever read a magazine with topics on environment?

Yes _____ No _____

If Yes, can you list the magazine titles?

Did the magazine encourage you to take action in conserving the environment?

Yes _____ No _____

If Yes, list the action or actions you undertook.

13. If you were to suggest changes, what improvements would you give to enable yourself and others to learn more about the environment?

a) Suggestion to your school? (Teacher, Headmaster etc)

b) To your parents?

c) To your government?

14. What are your most favourite topics on the environment? List 3 only.

Why do you like the topics?

- 15 Write a short paragraph about the person who has made you learn about the environment and how he or she has helped you either to learn about the environment or encouraged you to take action.

Thank you very much for answering the questions.

QUESTIONNAIRE FOR TEACHERS

1 Subject(s) taught _____

2. Class taught (tick relevant ones)

Class 6 _____

Class 7 _____

Class 8 _____

3. Male----- Female----- (Tick one)

your subject and class. For each, tick the frequency and name the class if you named more than one class.

Topic	Always (5)	Very frequently (4)	Sometimes (3)	Very few times (2)	
Wildlife					
Water pollution					
Air pollution					
Land pollution					
Deforestation					
Ozone Depletion					
Natural Hazards					
Overgrazing					
Toxic Chemicals					
Global Warming					
Soil Erosion					
Slum Problems					
Others: (Specify)					

4. Are there topics you would wish to be added, which you consider to be important to pupils at the level which you teach?

Yes _____

No _____

If Yes, specify / list the topics.

5. In the course of teaching the environmental topics in your subjects(s), which of the following resources do you mostly use? (Tick and add class in brackets)

Resource	Always (5)	Most of the time (4)	Sometimes (3)	Very few times (2)	N (1)
Magazines					
Radio					
Newspapers					
Video					
Computers					
Television					
Resource persons					
Films/Slides					
Textbooks / Books					
Field trips / Tours					
Drama					
Story Telling					
Posters					
Environmental games					

6. Generally some teaching /learning resources are considered more effective than others in creating an impact on students and encouraging them to take environmental action. Please rate the ones you have mainly used.

Resource	Very effective (5)	Just effective (4)	Some effect (3)	Not effective (2)	Not effective at all (1)
Computers					
Radio					
Magazines					
Television					
Video					
Field Trips / Tours					
Resource persons					
Films / Slides					
Textbooks / Books					
Newspapers					
Drama					
Environmental Games					
Posters					
Story telling					
Others specify)					

7. Which of the above are available in your school?

9 Are there resources available outside the school compound but within Nairobi City which you feel can be effectively used to learn environmental issues?

Yes _____ No _____

If Yes, please list them.

(b) Do you feel they are or they can be easily accessed? Yes No
If No, state the cause of lack of access.

be of importance? Please fill the resource type in the appropriate box.

	Always	At times	Moderate	Occasionally
	(5)	(4)	(3)	(2)
Lack of enough time				
Lack of funds				
Lack of easy access				
Resource not available				
Lack of knowledge of how to use				
Administration does not easily allow				
Resource inadequate in quantities				
Resource not reliable				
Overcrowded curriculum				
Lack of parent support				
Not interesting to students				
Resource not effective in creating impacts on students				
Lack of community support				

Environmental activities?

Yes _____

No _____

If Yes, please specify how.

If No, what do you think are the reasons?

12. Do your students undertake any specific tasks/actions outside the classroom on environmental issues?

Yes _____

No _____

If yes please specify the activities undertaken:

a) In the school compound

b) In the community(Nairobi City)

c) In Kenya.

d) Outside Kenya

helping your students learn about the environment?

Yes _____ No _____

If yes please specify the organisation and how it has been involved.

Thank you very much for answering the questions



LORETO CONVI
P.O. BOX 30258
MSONGARI
NAIROBI

Phones: 444777, 448480
449518, 443892
Fax: 440545

9th August, 2002

Dear Sir,

**RE: LORETO MSONGARI ENVIRONMENTAL AWARENESS AND
CHARITY WACKY GAMES**

We are pleased to inform you about our annual Wacky Games to be held on Saturday 28th September 2002 from 9.00 a.m. to 5.00 p.m.

In this activity we seek to: -

- Heal and conserve the environment by creating awareness among the youth.
- Deal with the plight of the less fortunate children as children for children by raising funds.
- Interact and have fun.

Last year over 10 schools and children's homes participated and with the improvements we have put in place, we expect a bigger crowd this year.

As a firm you can contribute to this worthy cause by: -

- Sponsoring a school to participate at 2000/=
- Sponsoring publicity items like posters, pamphlets, fliers, and airtime on electronic media or advertisement space in the print media.
- Sponsoring a fun activity like face painting, disco, fashion show, Miss Environment contest, story telling, comedians, Drama etc.
- Hiring a stand to display and sell your goods.

We urge you to participate and leave a mark on the environment and the lives of many needy children.

Yours faithfully,

Seraphine Oweggi

SR. SERAPHINE OWEGGI
HEADMISTRESS
LORETO CONVENT MSONGARI

