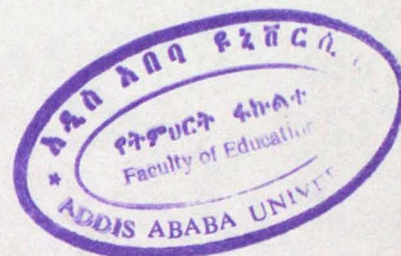


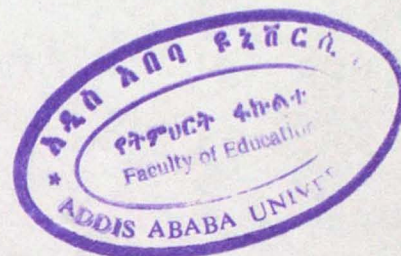
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**A Thesis Submitted to
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**In Partial Fulfilment of the
Requirements for the Degree
of Master of Arts in Education**

By

**Melaku Girma
June, 1994**

ADDIS ABABA UNIVERSITY
School of Graduate Studies

An Investigation into the Integration of
Environmental Education into Social
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By
Melaku Girma



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ABSTRACT

The purpose of this study was to investigate the integration of environmental education into social studies course in the T.T.Is, through examining the trainees' environmental education competencies which involve changes in knowledge, attitudes and skills.

To achieve the objectives of the study 321 trainees from four T.T.Is were randomly selected. In addition to this, the instructors of the course and the teaching materials were considered as sources of additional data.

A 10-page questionnaire, which included: the test, attitude inventory and rating scale, was administered. The syllabus and the textbook of the course were analyzed and interviews with the instructors were conducted. The data collected were statistically treated.

The results suggested that the course seems to have some elements of environmental education, even though they do not measure up to the objectives and standards of the present day environmental education program. The slight majority of the trainees displayed mastery of environmental knowledge as far as the test results are concerned. However, when seen from different directions it is found to be premature to generalize that the trainees have foundational competency in environmental knowledge. Even though the available information and findings alone are not comprehensive to provide conclusive results, the trainees' attitudes toward environmental problems, environmental education and environment in general found to be highly desirable. Regarding environmental skills the trainees appeared to have a minimum competency in environmental action skills.

In all the three cases statistically significant differences were observed among the T.T.Is considered. Relatively positive significant relationships were obtained between the trainees' environmental knowledge and environmental attitudes. On the other hand, between the trainees' environmental knowledge and environmental skills and between the trainees' environmental attitudes and environmental skills no clear systematic correlations were obtained.

Many constraints and difficulties were reported concerning the integration of environmental topics and activities into the course. In general a very modest and uncoordinated teacher training effort in the area of environmental education seemed to be the rule at every institute studied in this inventory.

The practical implications of these findings to the development of environmental education in the course specifically, and in the other courses in general are indicated.

CHAPTER ONE

Introduction

1.1 The Problem

Albert Schweitzer, cited in Myshak (1972), once said, "Man has failed to foresee and forestall. And he shall end by destroying the earth" (p. 457). Environmental problems during this century seem to be fulfilling his prophecy. Man is hellbent on a collision course with nature and himself. We find man rapidly chronicling his own demise. In other words, the human future is at risk. The world's ecology is being destroyed. The survival of future generation is thus in danger.

No country can remain immune or free from environmental problems, even though there is a variation in nature, magnitude and complexity of the problems (Stapp 1984; Brundtland 1985; United Nations Conference on Environment and Development 1991). According to Stapp, developing countries frequently experience problems associated with underdevelopment - farming techniques leading to soil erosion and depletion, improper management of forest resources, poor health and nutrition, vulnerability to natural disasters, and the lack of educational program to help resolve these problems. Stapp further indicated that many developed

countries are faced with severe environmental problems - industrial pollution, overexploitation of resources and the variety of social and physical problems confronting Metropolitan areas.

Nevertheless, the magnitude, ubiquity and urgency of global, regional and local environmental problems are now widely recognized: they have become a major concern of the international community (UNEP 1988; Buzzati-Traverso 1977; Connor 1990). According to United Nations Environment programme (UNEP), during the 1970s, environmental issues came to be established as a permanent feature of national and international policy, and environmental perceptions broadened enormously. The recent (June 1992) extraordinary meeting of more than 100 world leaders and 30,000 other participants in Rio de Janeiro, Brazil, which is widely known as the Earth Summit, seems to be a good example of the world's awareness of environmental problems.

Ethiopia is one of the countries in the world which suffer severe environmental problems. It has been realized that the frequent occurrence of drought and famine in Ethiopia are mainly due to the deepening ecological crisis in the country (MOA and FAO 1986; EFAP 1992). The weekly news Magazine, Time once remarked:

Since 1900, Ethiopia's burgeoning population has stripped more than 90% of the country's forests for

firewood and farmland, allowing 1 billion tons of top soils to washway every year. Some 8,000 acres (3,200 hectares) of the once fertile highland can no longer bear crops, and an area the size of Switzerland may be bare rock by 2010 (1992, p. 55).

This instance alone seems to be enough to visualize the magnitude of environmental deterioration in Ethiopia. Hence, we cannot afford for anyone to neglect it. The penalty of neglect is to undermine the very growth we strive to accomplish. "Growth which does not include environmental considerations is like a house which is built on sand. It cannot be sustained "(Brundtland 1985, p. 67).

To combat environmental problems, a new environmental ethic must be established supported by citizens at grass-roots level with a more respectful attitude towards acknowledging the links between people, environment and development (Stapp 1984; Sytnik et al 1985; Palmer 1991; Aldrich and Blackburn 1977; Iozzi 1989; World Commission on Environment and Development 1987; Unesco 1980). These and other authorities have stated clearly that environmental problems, which are largely social problems, cannot be resolved by looking at only technological solutions or crisis oriented remedial efforts.

In general, there is increasing recognition in the literature that there can be no hope of finding workable solutions to environmental problems until education is modified to enable people from all walks of life to comprehend

the fundamental interaction between humans and their environment. For instance, Unesco (1980) declared:

Education has a crucial contribution to make to the vital task of improving the management of our common heritage, the earth. It can alert all sections of the population to the most pressing problems that confront us (p. 21).

Nowadays the need for educational intervention, under the name 'environmental education', in developing sensitivity to environmental care, in enabling people to regulate their behaviour and act responsibly has received much attention. Many countries have already started such kind of educational program and gained considerable positive results and still make environmental education a high priority.

The goal of environmental education is "to bring about informed environmental policies for society which will be compatible with the maintenance of a suitable planetary environment" (Pettus 1976, p. 48). The Intergovernmental Conference on Environmental Education was held in Tbilisi, Georgia, in 1977. It stands, at present, as the final act in the thrashing out of definitive statements about environmental education (Unesco-UNEP 1986, 1985; Unesco 1978). This conference has pointed out that to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment, as the goal of environmental education (Unesco

1978; Gronvall 1990). As a result, awareness, knowledge, attitudes, skill and participation are presented as the categories of environmental education objectives.

Ethiopia has carried out environmental education as a pilot project since 1985 (Gebeyehu, Yosef and Gronvall 1992). According to the authorities, in the formal education program, particularly in Teacher Training Institutes (T.T.Is) and primary and secondary schools, an attempt has been made to offer environmental education in some selected subject areas. Especially the T.T.Is are the focal points of the project with the assumption to produce a rapid multiplier effect down to grass roots level.

The researcher strongly believes that our environmental situation has been placed at risk and it can now be saved from peril only by the dissemination of environmental knowledge. Hence, teachers will have the lion's share of the job of disseminating the knowledge. This inturn implies the urgent need to strengthen ordinary pre-service and in-service training programs for teaching personnel aimed at making them capable of including environmental component in their teaching activities. In short, irrespective of the ways of the environmental education is introduced in the school curriculum, success of the program would depend primarily on teachers, since they are the central figures in schools (Jacobson 1985).

Thus, in order to reach children through our school system and make them think about environmental problems, teachers should have basic knowledge in environmental dimensions, their attitudes towards the environment must first be changed and they must acquire minimal skills before they attempt to open the child's eyes to his natural, man-made and social environment. According to Gill and Nayar (1988) and Wilke, Peyton and Hungerford (1987), the aim of teacher education program in environmental education is to develop among the trainees general competencies in terms of knowledge, attitudes and skills.

In view of the above notion, the purpose of this study ~~is~~, therefore, revolves around the environmental education competencies of the would be teachers or trainees in the T.T.Is of Ethiopia.

Various approaches are suggested for the introduction of viable programs in environmental education into the formal and non-formal education programs. However, it seems that there is a widespread agreement that environmental education should not be just one more subject to add to the already overcrowded school programs but should be incorporated or integrated into all subjects taught in schools (Galishin and Doraiswami 1972; McInnis 1972; Palmer 1991; Sytink et al 1985; Iozzi 1989; Caduto 1983; National Association for Environmental Education 1990). These authorities stressed that of the traditional

subjects, natural and social sciences, have the largest contribution to make to environmental education in all their aspects.

Several research works have been conducted in the area of environmental education in attempt to approach the teaching-learning process holistically and intentionally deal with the cognitive, affective and psychomotor domains (Fortner and Teates 1980; Jernigan and Wiersch 1978; Iverson 1976; Bryant and Hungerford 1977; Ramsey and Rickson 1976; Blum 1981, 1982; Iozzi 1989; Kinsey 1979; Hershey and Hill 1977; Gross 1978 and others). Knowledge, attitudes and skills are closely related even though they are not fully interdependent (Kerlinger 1965; Davies 1981; Gronlund 1976).

The different researchers in environmental education have studied these variables i.e., knowledge, attitudes and skill separately and cooperatively if programs in environmental education are to be effective in teaching environmental knowledge, positive attitudes and skills. They have presented major ideas and made several recommendations how the variables are related to environmental educations and seen to have practical implications for the educators.

Hence, it is from this point of view that the researcher finds interests to focus attention on the integration of environmental education in the T.T.Is of Ethiopia with

particular reference to social studies course.

1.2 Statement of the Problem

The intent of this study is to investigate the integration of environmental education into social studies course at some selected T.T.Is of Ethiopia. It attempts to examine whether the course helps the trainees to develop environmental education competencies, which take the form of knowledge, attitudes and skills. With this in mind, the objectives of the study are:

- to determine the trainees' environmental knowledge acquired from the course;
- to find out the trainees' attitudes towards environmental problems, environmental education and environment in general;
- to determine the trainees' environmental skills acquired from the course;
- to establish relationships between the trainees' environmental knowledge, attitudes and skills;
- to determine the status of environmental education in the course in question.

In view of the above objectives, it is expected to give answers to the following leading questions:

1. What are the objectives and content relevant to environmental education in the social studies course?
2. How much the trainees have progressed with respect to the mastery of environmental knowledge?
3. Is there any difference among the T.T.Is regarding mastery of environmental knowledge?
4. What are the attitudes of the trainees towards environmental problems and environmental education?
5. Is there any difference among the T.T.Is in regard to the trainees' environmental attitudes?
6. Are activities involved in the course to help the trainees to acquire environmental skills? If so, what is the level of occurrence of the activities?
7. Is there any difference among the T.T.Is with regard to the development of environmental skills?
8. Is there any relationship between the trainees' environmental knowledge, attitudes, and skills in the course?
9. What is the current position of environmental education in social studies course, in general, in the T.T.Is observed?

1.3 Significance of the Study

A study of the Ethiopian education literature of the past decades reveals little concern with integrating the

environment into formal and non-formal learning situations. There was no conscious attempt to give students a clear picture of our environmental problems. From recent time onwards, however, the urgent character of our environmental problems became more and more evident.

In light of this, assessing the status of environmental education in T.T.Is is so important for the following reasons:

- . It appears that the issue of environmental education in Ethiopian context has not been researched at all adequately. Therefore, this study may initiate others to perform a better and indepth study on the problem.
- . The findings may provide a useful piece of information on the status of the graduated trainees with regard to their environmental education competencies acquired from the course.
- . In addition, it may also help to lay the ground for a more detailed and integrated planning and implementation of the teaching of environmental dimensions in other subjects or courses of the T.T.Is.
- . Moreover, this study attempts to shade light on the urgent need to integrate environmental education concept into the entire system of education at all levels.

1.4 Delimitation of the Study

An examination of the integration of environmental education into a given subject involves several aspects such as:

- . aims and objectives
- . organization of content
- . teaching methodology
- . evaluation
- . and other curricular issues related to environmental education

without underestimating the importance of these and other factors, this study, however, is limited to the investigation of the product variables, i.e., environmental education competencies which take the form of knowledge, attitude and skill. Therefore, this study, in line with its purpose, focus on these components acquired by the would be teachers (now graduated) as result of the instructional process of environmental education in social studies course.

Due to its limited scope (only four T.T.Is are selected) the generalizability of the study is proper only to the population of these T.T.Is.

1.5 Limitations of the Study

The nature of the study has limited the time of data gathering to be at the end of the training program of the T.T.Is. As a result, the researcher had very limited time to reach all the selected T.T.Is. Therefore, constraints in time and money (to some extent) have restricted the researcher from doing many things related with data gathering, like observations, discussion with administrative personnel and trainees, etc. Besides this, shortage of material which is based on serious research on environmental education in Ethiopian context is found to be the major restriction of this study. Nevertheless, adequate care has been made to preserve the level of quality of this paper by sacrificing whatever financial, material, and energy it required.

1.6 Operational Definitions

Action (problem-solving)

skills : Activities involving the actual doing of investigation and problem-solving.

Attitudes : Feelings directed towards an idea, object or event. Include likes and

dislikes and perceptions of what is aesthetic and unaesthetic. Attitudes here are considered to contribute to values.

Environment

: Viewed in its totality which comprises the whole set of natural or biophysical and man-made or socio-cultural systems in which man and other organisms live and interact.

Environmental Education

: An action process related to the work of almost all subject areas. It is concerned with the dynamic relationships between man and nature. It aims at improving the environmental quality.

- Environmental Problem : A degraded state of the environment which poses serious threats to the well-being of ecosystems as well as the very survival of the human race. A situation demanding immediate corrective action.
- Knowledge : Knowing about something and being able to recall it from memory.
- Skills : Pertaining to action and thinking skills.
- Thinking (Mental) Skills : Ability to apply knowledge, analyse information, synthesize data, develop ideas and judge the values of ideas, objects and events.

CHAPTER TWO

Review of Related Literature

2.1 Environmental Problems and Education

2.1.1 Environmental Problems

Interaction between man and the environment has existed since humans first appeared on earth. Such interaction is an intrinsic aspect of human development. Man's capacity to adjust his relationship with the environment, and to transform the environment itself has passed through various phases. In this connection:

the fundamental factor that distinguishes modern society from preceding societies is the accelerating pace of the changes caused in the environment by the scientific and technological revolution, the massive scale of those changes and the universality of some of their consequences (Unesco 1980, p. 13).

The concept of the environment is now being extended to include not only the bio-physical natural environment, but also the man-made physical as well as the political, economic, cultural, technological, social and aesthetic environment (Unesco-UNEP 1985; Stapp 1984; Sytnik et al 1985; Schofthaler 1984; Kuenen 1986).

Environmental problems, which are often broadly referred to as the environmental crisis, vary widely in nature, magnitude and complexity: hunger and malnutrition, the considerable disparities between human populations in respect of their quality of life, the degradation of natural ecosystems and landscapes, desertification, the depletion of the ozone layer, toxic waste disposal, the deterioration of the living environment and others have represented serious threats to our world, aptly referred to as a spaceship earth (Unesco 1980, UNEP 1992; Unesco-UNEP 1992).

Environment is not a concern which is confined to the rich countries, those who can afford to pay attention (Brundtland 1985). "Environmental problems exist in all countries of the world and at every state of economic development and political ideology (Stapp 1984, p. 87). In general environmental problems at the global , national and local levels were escalating at such a rapid rate during the last few decades that they have emerged as a major concern of the international community.

✓ 2.1.2 Educational Intervention

Since 1970s it is widely recognized that environmental problems cannot be resolved by looking at only technological solutions. "In order to resolve our environmental problems we must learn and act in new ways" (Aldrich and Blackburn 1977,

p. 9). They stressed that we must approach economic development with greater awareness and understanding of the environmental implications of our actions. According to Aldrich and Blackburn, without broad public understanding of the issues and alternative courses of action, we will be unable to move from crisis-oriented remedial efforts to the positive directions that support quality of life and environment.

"Our goal should be not to conquer the natural world but to live in harmony with it" (Myshak 1972, p. 458). To attain this goal, according to Myshak, we must learn how to control both the external environment and ourselves. Especially we need to learn how to avoid irreversible change. If we do not, we shall deny to future generations the opportunity to choose the kind of world in which they want to live. How do we bring about a greater understanding that will make it possible for man to respond to opportunity as well as need? Very much to the point here is a conclusion reached by Myshak. He wrote:

The first thing is to reform the curriculum.... Education must prepare growing human beings for the future, not only their own future but that of their children, their nation and their planet. For this, it must be aimed at varied excellence (including the training of professional elites) and at the fullest realization of human possibilities (p. 459).

Indeed, one of the few matters upon which all governments agreed; in the United Nations Conference on Environment and

Development in Rio de Janeiro, is the importance of reorienting education towards development, increasing public awareness and promoting training (United Nations 1992). The conference stated:

Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. While basic education provides the underpinning for any environmental and development education, the latter needs to be incorporated as an essential part of learning (Section IV, Chapter 36, p. 2).

In short, the role of education in replying to the challenges of environmental problems and disturbances impressed firmly in our social thinking, the key to their solution is already in our hand -environmental education and training.

2.2 The Concept of Environmental Education

2.2.1 History and Philosophy of Environmental Education

It is evident that there has always been some awareness of the values of the environment and the need for its conservation and protection in the traditional value systems of most cultures, where the people considered themselves as a part of the natural environment whose proper management and well-being was essential for their existence and further

development. In other words, environmental education was practiced in ancient times too. For example, "the Indo-Aryans lived in harmony with nature and enjoyed its beauty. They developed introspective mind for it. Both in the pre-vedic and the vedic periods the Aryans sang hymns in deep appreciation of nature" (Jacobson 1985, p. 7). By soil erosion the fine particles of the soil are washed away while the coarser fractions remain. This process was well known to ancient Greek and Roman scholars. For instance, Plato, cited in Dahl (1985, p. 68), wrote in one of his dialogues:

...what now remain of the once rich land is like the skeleton of a sick man, all the fat and soft earth having wasted away, only the bare framework is left. Formerly, many of the present mountains were arable hills, the present marshes were plains full of rich soil; hills were once covered with forests,.... Moreover, the land was enriched by yearly rains, which were not lost, as now, by flowing from... provided abundant springs and flowing streams in all districts. Some of the now abandoned shrines, at spots where former fountains existed, testify that our description of the land is true.

This healthy attitude towards the environment that existed in traditional societies unfortunately began to decline gradually with the advancement of industrialization and urbanization coupled with the changing values associated with modern consumption oriented life styles (Fensham and Hunwick 1983).

A new interest in environment and an awareness for its well being began to develop gradually during the 1970s, as a result of both the global concern for the environment and the deterioration of the environmental situation locally. World wide growing concern regarding the need to do something about the conservation and improvement of the environment for mankind prompted the United Nations to convene a conference on human environment in Stockholm in June 1972 (Holdgate et al 1982). Recommendation 95-101 of the conference emphasized the need for environmental education (United Nations 1972). The International Environmental Education Programme (IEEP) was set up in 1975 in response to recommendation 96 of the conference (Jacobson 1985). In general the conference recommended the development of environmental education as one of the most powerful instruments in an all-out attack of the world's environmental crisis and thus provided an impetus for promoting interest in environmental education during the 1970s, at national and international levels. The seventies, therefore, may be referred to as the Decade of Environmental Education (Unesco - UNEP 1985).

Environmental education is not a new discipline but a new dimension in the education system (Unesco-UNEP 1985; Jacobson 1985; Sytink et al 1985; Field 1993). It is reported that, earlier, environment formed part of formal and non-formal education no doubt but it was never treated as a whole. Different aspects of environment constituted parts of

different disciplines e.g. biology, geography, economics, nature study, rural science and others and thus were dealt with in isolation. Unesco-UNEP (1985) further stated:

these curricula were concerned only with two dimensions related to the environment, viz. learning from or through the environment and learning about the environment. A vital third dimension, education for the environment, was missing. Moreover, the methodology... was limited to the impartation of factual knowledge about the environment; the content was not based on real life problems; the problem-solving approach was not evident; and an interdisciplinary approach to environmental problems was lacking (p. 8).

A special role in establishing general principles of environmental education was played by the Unesco-UNEP International Environmental Education Programme (IEEP). As part of the activities of IEEP, an international workshop on environmental education was held at Belgrade in 1975. A statement adopted at this workshop which provided the framework and guiding principles for environmental education came to be known as the Belgrade Charter (Unesco 1976).

The Belgrade workshop was followed by a series of regional meetings held for Africa, Asia, the Arab States, Latin America and the Caribbean and Europe. The recommendations of these meetings were documented and served as part of the resource material for the Intergovernmental Conference on Environmental Education in Tbilisi, Georgia, USSR organized by Unesco in cooperation with UNEP from October 14-26, 1977 (Unesco-UNEP

1986). This conference attended by sixty-six member states of the United Nations, was highly significant in the development of environmental educations. It stands, at present, as the final act in the thrashing out of definitive statements about environmental education (Unesco-UNEP 1985, 1986; Unesco 1978). Following this conference, member states responded positively by undertaking the development of environmental education and also by introducing legislation to protect the social and physical environment. "Environmental education is now a well-established reality of constantly increasing importance, although its interpretation and implementation vary" (Syтиник et al 1985, p. 18).

2.2.2 Goals, Objectives and Guiding Principles of Environmental Education

The Tbilisi Conference endorsed the following goals, objectives and guiding principles for environmental education, and are internationally accepted (Unesco 1978).

1. The goals of environmental education are:
 - a) to foster clear awareness of, and concern about, economic, social, political, and ecological interdependence in urban and rural areas;
 - b) to provide every person with opportunities to acquire the knowledge,

values, attitudes, commitment and skills needed to protect and improve the environment;

- c) to create new patterns of behaviour of individuals, groups and society as a whole towards the environment.

2. The categories of environmental education objectives:

Awareness : to help social groups and individuals acquire an awareness of and sensitivity to the total environment and its allied problems.

Knowledge : to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.

Attitudes : to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.

Skills : to help social groups and individuals acquire the skills for

identifying and solving environmental problems.

Participation: to provide social groups and individuals with an opportunity to be actively and responsibly involved at all levels in working towards resolution of environmental problems.

3. Some guiding principles for environmental education: see Appendix A.

2.2.3 Terminology: what is Environmental Education?

Environmental education has been defined in a number of ways. However, the following definition was accepted and recommended for wide use by the International Working Meeting on Environmental Education in the School Curriculum (IUCN Commission of Education 1970).

Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality (p.40).

In the seminar on environmental education organized by the

Finnish National Commission for Unesco at Jammi in 1974, quoted in Sytnik et al (1985), it was defined as "...a way of reaching environmental protection targets and is not a separate branch of science or a special subject of study. It should be included in the entire life-long educational process" (p.13).

Proceedings of the organization of American states conference on Education and Environment in the Americas, 1971, cited in Jacobson (1985), stated:

Environmental education involves teaching about value judgements and the ability to think clearly about complex problems-about the environment-which are as political, economical, and philosophical as they are technical (p. 7).

In summary, environmental education is an action process related to the work of almost all subject areas. It is concerned with the dynamic relationships between man and nature. It aims at improving the environmental quality.

2.3 Approaches to School Environmental Education

No one doubts the need to introduce environmental education into schools. Its basic principles and ideas are fairly well developed, but the urgent question is how to put them into practice. For this purpose, a comprehensive school curriculum for environmental education has to be developed which is

suitable and, at the same time, acceptable in terms of space and duration within the over-all school time budget.

Galishin and Doraiswami wrote:

Various approaches exist for the solution of these problems. They can be roughly grouped into three categories: (a) environmental topics may be dispersed through the entire or major part of the school curricula by certain insertions in the syllabuses of various disciplines; (b) a specially designed nature conservation unit may be a chapter or section within one of the existing school subjects; (c) an integrated course of environmental conservation can exist as a separate discipline equal with other school subjects. (1972, p. 464).

According to Galishin and Doraiswami, the integrated approach is very popular in sense that, this course is the best way to form the whole idea of environment and make the younger generations aware of it. However, its implementation is very difficult, because on the one hand none of the school subjects can be easily eliminated in favour of a new syllabus and on the otherhand, nothing can be added smoothly to the present school periods.

The inclusion of environmental education in formal education is currently envisaged through a variety of procedures, all of which, in varying degrees, presuppose an interdisciplinary approach (Unesco 1980). It is stated:

These procedures range from the mere introduction of an environmental component into the different traditional subjects to the total integration of those subjects around a project for community activities relating to the environment, and include an approach combining several disciplines with some affinities as regards their ideas and methods. The approach which seems most at variance with what is needed would be to introduce environmental education as a separate subject simply superimposed on those already taught (p. 39).

The Unesco-UNEP International Environmental Education Programme has undertaken a Comparative Survey of the Incorporation of Environmental Education into School Curricula to find out, in a few countries of each world region, how environmental education has been introduced to school curriculum in the context of different educational systems (Unesco-UNEP 1985). The study revealed that the introduction of the environmental education to the curriculum is found to be carried out through a variety of procedures. However, in the study it is concluded that:

The dominant trend appears to be to 'infuse' content relevant to various environmental problems and issues into the existing subjects of the curriculum. This approach has been adopted by almost all the countries in the study and infusion has been mainly to science and social studies (p. 130).

The strategy of infusing environmental concepts into the existing subjects and using them as carriers of environmental education seems to be accepted by many scholars as far as implementation is concerned. McInnis (1972) have related

environmental education to the various disciplines. He wrote:

The natural sciences, tell us important things about the natural environment, ecological principles, natural eco-systems; in other words, how the world fits together. The social sciences tell us important things about human interaction and human ecology. The creative arts give us a means of expression for man's response to his total environment while the language arts provide a framework for understanding and communicating our knowledge, ideas, and feeling, without which there would be no way to deal with our environment beyond mere existence (p. 85).

David Orr, cited in Howarth (1992), appeared to support McInnis' idea. He said:

...all education is environmental education. By what is included or excluded we teach students that they are part of or apart from the natural world. To teach economics, for example, without reference to the laws of thermodynamics or those of ecology is to teach a fundamental important ecological lesson: that physics and ecology have nothing to do with the economy. It just happens to be dead wrong. The same is true throughout all of the curriculum (p. 10).

Environmental education is not a statutory subject in its own right, but must be viewed as being complementary to and permeating the core and foundation subjects; in other words, environmental education should play the role of a catalyst, or common denominator (Palmer 1991; Sytnik et al 1985). The National Association for Environmental Education (1990) declared that "Environmental education runs through the whole curriculum. Good environmental education knows no subject

boundaries, nor should it be confined to particular lessons or occasions" (p. 25). Finally, Iozzi (1989) underlined that environmental education must be included in more than just science and social science programs - the subject areas that most commonly address environmental issues in our schools. "Rather" said Iozz, "environmental education must be infused, as appropriate, into all subjects taught in our schools" (p. 6).

In brief, most scholars in environmental education promote a holistic approach to dealing with environmental issues, whereas only a few advocate that this subject should be added as a separate course of study to an already overcrowded school curriculum. Of course, this does not mean that separate elective courses of the higher level are not valuable or important. Indeed, such courses are very worthwhile for students interested in learning more about the environment than is taught in the school curriculum.

2.4 The Need for Environmental Education in Teacher Education

During the 1970s much has been written about the need for environmental education in general, and for teacher training in environmental education specifically. The need for trained personnel to develop and implement environmental education has been discussed in numerous Unesco publications. It has been

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stated that:

the possibilities of integrating environmental education into formal and nonformal education programmes and the implementation of such programmes depend essentially (without however underestimating the importance of other factors) on the training of the personnel responsible for putting the programmes into effect (Unesco-UNEP 1977, p. 41).

The need for teacher training in environmental education has also been documented by responses to a Unesco questionnaire entitle: 'Assessment of Resources for Environmental Education: Needs and priorities for member states' (Unesco-UNEP 1977). The principle conclusion drawn from the survey was that a majority of Unesco member states (71%) have very high needs in environmental education. Perhaps, the most intense of these needs at the world level concerned the training of personnel for educational activities (81% of the countries). The need for teaching personnel with training in environmental education was apparent across both geographical regions and educational levels (pre-school, primary, secondary and tertiary).

Combating ignorance on environmental issues, providing people with the knowledge and skills needed for dealing with them and conveying the sense of responsibility necessary for proper application of these skills and knowledge are the principal objectives of environmental education in the formal education (Grabe 1987). Thus, in order to fulfill this

excellent statement of objectives, the need for trained environmental education personnel is apparent.

The goal of any teacher education effort or programme in environmental education (E.E.) should be to develop environmental education competencies. These competencies take the form of knowledge, behaviours, and skills which are necessary to effectively incorporate the environmental dimensions in educational programmes (Wilke, Peyton and Hungerford 1987, p. 4).

The strategies for introducing environmental education to the teacher education curriculum, particularly to the pre-service training, would be similar to those adopted for the school curriculum. It can be introduced either as a separate course altogether, or a separate subject within the existing courses or can be infused into the existing subjects in the teacher education curriculum (Unesco-UNEP 1985; Wilke, Peyton and Hungerford 1987). It is reported that eventhough a few countries (e.g. Kenya, Malaysia, Srilanka, former USSR) have attempted to introduce environmental education as a separate course in teacher education, most countries have adopted the multidisciplinary infusion approach which is the most popular one at the school level too.

Inservice training of teachers in environmental education can take various forms: workshops, graduate and continuing education courses, staff meetings, conferences, staff exchanges, institutes released time for staff improvement,

correspondence courses and others (Pettus and Schwaab 1979; Sanden and Evia 1993). Another strategy adopted in some countries is to prepare detailed teachers guides to help teachers in the teaching of the new content (Unesco-UNEP 1985). In service training in environmental education is also provided through Distance Education Courses (e.g. Venezuela).

✓ 2.5 Environmental Degradation in Ethiopia

In Ethiopia environmental degradation and deterioration have been major causes of starvation and death.

Actually, there is a long history of drought and famine in Ethiopia and in the more recent years it has become a regular occurrence. It has been realized that the frequent occurrence of drought and famine in Ethiopia are not entirely due to natural causes. Land degradation, as a result of misuse of land resources, has had a significant role in intensifying the frequency and effects of these calamities (MOA and FAO 1986, p. 9).

The deepening ecological crisis in Ethiopia is seen as stemming from misguided and unregulated modifications of the Ethiopian environment, in particular the vegetation, soils and natural ecological processes (EFAP 1992). According to EFAP, the crisis resulted from an increasing human population that is dependent upon non-sustainable agricultural practices and the depletion of living natural resources, especially forests and vegetation beyond their self-replicating capacity.

The thick volcanic soils in the Ethiopian highlands have high inherent fertility and once supported large forests with diversified flora and fauna (Westphal 1975). Westphal noted that the cool climate and ample rainfall attracted early human settlement, and mixed agriculture and stock keeping emerged three thousand years ago. The use of draft animals and ploughs was introduced and stable agricultural communities developed. "Environmental degradation occurred in the vicinity of settlements, but at that time an ample supply of virgin land was available to support the expansion of the growing communities "(Stahl 1990, p. 1). Expanding cultivation over the centuries from northern Ethiopia gradually eroded the natural vegetation (Tewolde Berhan 1990). Tewolde Berhan further noted that from the end of the last century the natural vegetation in central, eastern and southern Ethiopia has come under increasing pressure of encroachment by shifting and settled agriculture.

Population growth in the twentieth century, enhanced by the partial control of epidemics and by the relatively peaceful period after the second world war, has given a new dimension to the pressure on land (Stahl 1990). Results of the last census, taken in 1984 revealed a total of 42 million people, with a yearly growth rate of 2.8 per cent (central statistical office 1985). Should the population continue to grow at this rate, it will reach more than 100 million by the year 2013 (United Nations Population Fund 1989). In view of this, the

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scope for further expansion of cropland is negligible in many parts of the highlands: the land frontier is closed (Stahl 1990).

In his speech, at the United Nations Conference on Environment and Development, H.E. Ato Tamrat Layne, Prime Minister of the Transitional Government of Ethiopia, said "In Ethiopia, we were surrounded by so much nature that its beauty and immensity was overwhelming. Tragically, only 3% of what was once 60% of the country is now forested" (Report of the Ethiopian Delegation 1992, p. 3).

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Due to continuous deforestation, erosion is Ethiopia's number one environmental problem in which between 1.0 - 3.0 billion tons of top soil washaway every year (MOA and FAO 1986). It is indicated that parts of Eritrea and Tigray have already been badly eroded, while the densely populated and intensively cultivated regions of Gondar, Wollo and northern Shoa are now in the frontline of environmental degradation. Furthermore, it is estimated that soil erosion in these areas reduces crop yields by 1 per cent per annum, while biological degradation (a decline in organic matter) may cause a further 1 per cent reduction. Eroded land has progressively shifted to less productive uses as crop yields decrease and the nutritional composition of grasses deteriorate, providing poor grazing for livestock. Eventually, the land produces neither crops nor feed for cattle.

A very rapid agricultural take-over detrimental to wildlife is taking place in the Ethiopian Rift Valley which was once teeming with a fabulous wildlife population (Blower 1968; Brown 1972). The wildlife situation, especially with regard to our larger wild animals, is very different from that which prevailed a few decades ago (Andeberhan 1982). Andeberhan noted that generally, large mammals throughout Ethiopia have undergone a serious decline in numbers mainly due to habitat destruction or alternation of the ecosystem as a result of undiscipline agricultural practices and forest exploitation. Andeberhan further reported:

....Steep slope cultivation in Chercher, Bale and Simien Mountains progresses unabated. This type of landuse in these mountains and other similar areas will, in the end, make them uninhabitable not only for the Mountain Nyala, Walia and Simien Fox which are already living in such small 'ecological islands', but for man himself (1982, p. 4).

Currently, many endemic Ethiopian species are either endangered or threatened with extinction. Animals like elephants have diminished to a very small population, warranting immediate attention at a national level.

It is that the environmental issues, especially relating to natural vegetation, soil and wildanimals, are major constraints to Ethiopia's current development and more seriously threaten to future prosperity of the country.

✓ 2.6 Environmental Education in Ethiopia

Environmental education in Ethiopia was initiated in 1985, at a time when the northern part of the country was hard hit by severe drought (Beletu and Yosef 1990; Gebeyehu, Yosef and Gronvall 1992; Fitzgerald et al 1987). It is reported that environmental education is operating under the Ministry of Education (MOE) with financial assistance from the Swedish International Development Authority (SIDA). It is also reported that the program has been operating as a pilot project and is working in collaboration with the Ministry of Agriculture (MOA), the Ministry of Health (MOH), and other national and international institutions.

Eventhough conservation works, such as, tree planting and construction of terraces, earth bounds and check-dams, by MOA have been undertaken since the mid 1970s, the local communities were not committed to carry out the maintenances of such structures and to the protection of forests (Fitzgerald et al 1987; Gebeyehu, Yosef and Gronvall 1992). In other words, little is accomplished in the way of changing the attitudes of the people. It was, therefore, decided that MOE should join the MOA conservation program by using its educational network to combat ignorance on environmental issues. Thus, this project has developed from a pure conservation education project related to the MOA activities to a pilot project for environmental education in Ethiopia.

The environmental education pilot project, which was started in Semene and Debub Wollo, in 1985, was extended, a year later to Semene Shewa and more recently it was further expanded to Eastern Hararghe and Sidamo regions (Beletu and Yosef 1990; Gebeyehu, Yosef and Gronvall 1992). According to Gebeyehu, Yosef and Gronvall, there are 67 project centers distributed in these regions and the centers are: a) teacher training institutes (T.T.Is); 2) primary, junior, secondary and senior secondary schools; 3) community skill training centers (CSTCs); 4) basic development education centers (BDECs). It is also indicated that the environmental education project has totally 63 satellite centers which are established and supported by the project centers.

The project began with the following general objectives (MOE 1985):

- To ensure the relevance of education in resolving the problems faced by the rural population of the highlands, by promoting greater understanding of the environmental conditions through the education system in rural areas.
- To raise the capacity of the education system through training and the dissemination of technical information.
- To promote a widespread pattern of community based action in the formal and non-formal education systems (p. 1).

The specific objectives within the education system include:

- To promote better understanding of the relationship between man and nature and to develop a better grasp of the scientific principles, which can be drawn from these experiences.
- To strengthen and enlarge the areas of cooperation between school and community in raising the conditions of life.
- To strengthen the concept and implementation of labour education (Gebeyehu, Yosef and Gronvall 1992, p. 4).

For effective implementation of the objectives laid out, the project has devised the following strategies, most of which are underway (Fitzgerald et al 1987; Beletu and Yosef 1990; Gebeyehu, Yosef and Gronvall 1992, Bayafers 1991; Seger et al 1989; Melkamu 1992).

a) Seminars and training

Orientation seminars, workshops and training in environmental education have been organized at different places for different groups who are directly or indirectly involved in the project.

- b) Distribution of environmental education materials and equipments

The project office identifies and provides relevant instructional materials, such as, books, pamphlets, posters, models, fact sheets, magazines, video cassettes, etc to the project centres. In addition to these overhead and slide projectors, radios, handtools and vehicles have been purchased and sent to the project centers, especially to the T.T.Is. Also seeds and seedlings have been provided by the MOA. Furthermore, educational mass media is broadcasting radio programmes on environmental issues to schools and adults.

- c) Initiation of practical activities

Practical activities are carried out in appropriate curriculum areas and include vegetable gardening, checkdam construction, plantation of trees, hillside terracing, preparation of recreational sites, cleaning and beautifying school compounds, production of teaching aids, construction of mass media studio, livestock rearing, fish rearing and others. These activities are carried out by trainees in T.T.Is, students and teachers in schools and by adults in CSTCs.

d) Classroom instruction

Besides the seminars and workshops made to disseminate environmental education to different target groups an attempt has been made to offer environmental education in the formal education program, particularly in the T.T.Is and primary and secondary schools, in four selected subject areas - agriculture, biology, geography and home economics. These subjects have been selected because they contain more environmental elements than other subjects.

At the beginning of the project physical conservation work or practical activity was separated from classroom instruction. This gave little understanding to why so much effort was put into environmental education program (Seger et al 1989). The project later developed, according to Seger et al, to include an integrated approach where classroom instructions were followed by practical activities. It is also pointed out that the prevailing teaching methodology in T.T.Is and schools is mainly a dissemination of abstract and theoretical knowledge and involves very little practical activities. As a response to this problem a methodological guide has been compiled by the coordinating office (Gronvall 1990, Gebeyehu, Yosef and Gronvall 1992).

Finally it is repeatedly suggested that the environmental education project office (Unit) should be accorded sufficient authority and status to undertake the following tasks in the future (Beletu and Yosef 1990; Gebeyehu, Yosef and Gronvall 1992).

- Organizing seminars, workshops and training in environmental education for the formal and non-formal education sectors, keeping educators aware of new developments in environmental issues;
- Production and distribution of additional materials on environmental education;
- Consolidation of the project activities so far accomplished and expansion to new areas;
- Making further research studies on cultures, customs and various environmental issues of different localities;
- Making proposals for incorporating environmental education in the national education program (curriculum);
- Establishing and maintaining an environmental education information center and others.

2.7 Summary of Some Research Findings on Environmental Education

2.7.1 Environmental Education at All Education Levels

Infuse environmental education into existing curricula at all education levels-kindergarten (before, if possible) through senior high school. Many studies reported in the literature seem to support this idea.

Bryant and Hungerford (1977) revealed that children of kindergarten age can form concepts concerning environmental issues. Hence, they suggested that environmental education can and should be started in the lowest elementary grades. Rajeski's research (1982) supported that of Bryant and Hungerford. He reported that subject matter should be progressively organized to take into account children's new motivations and interests in viewing the world and organizing knowledge. He further indicated that environmental education should begin in the early primary grades. Miller (1975) found that a significant portion of the development of attitudes toward environmental conservation and pollution occurs at the elementary school level. He also found that the environmental attitudes of eighth graders are not significantly different from those of adults.

2.7.2 Environmental Knowledge and Attitudes

There is recognition in the literature that there is a significant relationship between environmental knowledge and environmental attitudes. Fotner and Teates (1980) and Fortner (1978) obtained a significant relationship between knowledge of the ocean and attitudes toward marine issues. Moore (1981) reported a positive correlation between level of knowledge about energy possessed by students and their attitudes toward the environment. Stamm and Bowes (1972) and Cohen (1978) also reported a significant relationship between knowledge and positive environmental attitudes.

Ramsey and Rickson (1976) reported that increased knowledge regarding the nature and causes of pollution seemed to elicit more positive attitudes toward pollution abatement. They also suggested that there is a circularity between knowledge and attitudes in that one does not solely cause or even precede the other, but rather some knowledge may lead to initial formation of attitudes which in turn lead to further gains in knowledge and so on.

Conversely, some studies suggested that the relationship between environmental knowledge and environmental attitudes is unclear. Alaimo and Doran (1980) reported that science classes seemed to have a positive effect on students' knowledge about the environment over a two-year period.

However, neither concern about the environment, nor locus of control changed over the same period. Kinsey (1979) noted that knowledge alone cannot be relied upon to produce changes in environmental attitudes. There is evidence, according to Kinsey, that an environmental studies course can produce individuals who develop more solid arguments in defense of their previously existing, and often negative, environmental attitudes. They tend to integrate the concepts learned into strong support for the values decisions they previously made on the issues.

In another study, Bart (1972) found that students favoured least those initiatives designed to improve the environment that placed increased restrictions on personal freedom and existing purchasing preferences and patterns. According to Bart, attitudes toward governmental control were very negative.

Thus, several studies showed a positive relationship between environmental knowledge and attitudes, others revealed no relationship at all, while, still others showed a negative relationship between environmental knowledge and attitudes. In general it seems that most of these studies supported the idea that merely increasing knowledge of the environment is insufficient for inducing positive affective growth.

2.7.3 Environmental Education and Positive Environmental Attitudes

Increasing knowledge alone will not significantly change attitudes. With this in mind, there is a widespread suggestion that environmental education is effective in teaching positive environmental attitudes when programs and methods designed specifically to accomplish those objectives are used.

In a study involving fifth and sixth graders Gross and Pizzini (1979) presented a unit designed to prepare students for exploration of a wilderness community, the woodlands of Iowa. The students engaged in activities exploring concepts and providing knowledge about woodlands and certain environmental problems confronting those woodlands. As a result of that intervention the researchers found that positive attitudinal change can be induced as a result of educational experiences. Moreover, the advances achieved as a result of the intervention remained stable after one year.

Jernigan and Wiersch (1978) reported similar results in a study involving older children who resided in a suburb of a large city. Those children were exposed to both affective and cognitive awareness units outdoors as well as a traditional cognitive unit taught in the classroom. The affective unit taught outdoors produced a significant change in student

attitudes toward the environment. Iverson (1976) noted that educational objectives related to environmental knowledge and environmental attitudes and values need to be highlighted in daily classroom activities. Iverson concluded that to promote positive environmental attitudes, specific instruction geared to the affective domain is essential.

Several researchers have noted that it is extremely difficult to change environmental attitudes (Kohlenberg, Phillips, and Proctor 1976; Edwards and Iozzi 1983, Alaimo and Doron 1980; Superka and Harmes 1978). However, Kohlenberg, Phillips and Proctor (1976) reported that the process is facilitated by providing feedback to the subjects.

2.7.4 Various Types of Teaching Methods in Improving Environmental Education

A variety of teaching techniques seem to be useful for teaching environmental education in general. In study comparing an inquiry method to a values-oriented approach to environmental education, Superka and Harms (1978) found that both approaches were successful in increasing knowledge. The values-oriented approach, however, resulted in superior improvement in the affective area.

In two studies conducted by Blum (1981, 1982), he found that an open-ended inquiry method of instruction had a

positive effect on the affective domain. Aird and Tomera (1977) also reported positive results when using a guided discovery approach to environmental education. Burrus-Bammel (1978), using puppetry to communicate environmental message to fourth graders, found that growth in knowledge was significant immediately after the intervention.

2.7.5 Other Major Ideas

From the studies mentioned above other important ideas related to environmental education have also been identified. These are: positive environmental attitudes once acquired, appear to be long lasting; the relationship between environmental education and age, socio-economic status, place of residence, and gender is conflicting and inconclusive; outdoor education is an effective way of improving environmental education; include activities to help students develop moral maturity as it relates to environmental problem solving and decision making; and the media are powerful sources for promoting environmental education.

CHAPTER THREE

Research Design and Methodology

The methodology in the study was descriptive, particularly survey related to achievement of environmental knowledge, environmental attitudes and acquisition of environmental skills.

3.1 Sources of Data

The major sources of data were:

- i) the trainees' sample which consist of those trainees of 1992/93 academic year, who studied social studies course as area of emphasis at the selected T.T.Is;
- ii) the instructors of the course in the selected T.T.Is;
- iii) the instructional materials of social studies course.

3.2 Sampling Procedure

The T.T.Is selected for the purpose were Debre Berhan, Dessie, Awassa and Harar. They have been chosen for the following important reasons.

- Primarily, these T.T.Is are among the focal points of the environmental education project of Ethiopia (Gebeyehu, Yosef and Gronvall 1992). While this study was on its final stage the researcher has

learnt that expansion to the other T.T.Is has started.

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- Secondly, based on the information obtained from the project office, Debre Berhan and Dessie are labelled to have much experience in implementing environmental education in their training program. The remaining two T.T.Is are included in the project recently. This difference might help for comparison purpose.

The size of the trainees' sample was 321 (200 males and 121 females). This number is obtained by considering 60 percent from each of the four T.T.Is (for details see Appendix B). The trainees were identified using simple random sampling technique. The subjects of the study were all from those who took social studies course. This percentage of data sources appeared to be sufficient to conduct the study. And the findings that were obtained from such percentage of the target population seemed suffice to make dependable generalizations.

As to instructors, all the instructors of the course in the four T.T.Is were included. Their total number was 4. Regarding the instructional materials, the syllabus and the textbook of the course were considered in gathering relevant detail data related to the study.

3.3. Instruments Used

3.3.1 Achievement Test

A twenty item multiple-choice instrument was devised to determine how the trainees have progressed with respect to the mastery of environmental knowledge (see Appendix C Part Two). The multiple-choice item has been consistently regarded as a highly valuable, applicable and versatile objective item type (Ebel 1979; Gronlund 1976; Lindvall 1967; Noll, Scannell and Craig 1979; Thorndike and Hagen 1977). The items were drawn from the content of the course in question, and reduced from thirty to twenty in order to avoid repetition and boredom (since the trainees have to work on other items listed in the other parts of the questionnaire).

To discover how much and how well the trainees have achieved environmental knowledge a pre-determined performance standard or criterion below which a trainee was considered deficient was set up. Criterion-referenced tests are being recommended today for use in educational decisions about individuals, groups and programs. Criterion-referenced tests may also be used for decisions about how the class group or the students of an entire school system have progressed with respect to the mastery of important objectives (Noll, Scannell and Craig 1979; Popham 1981; Mehrens and Lehmann 1984).

Regarding standard-setting procedures, popham (1981) and Ebel (1979) have described different approaches to the determination of passing scores. Their suggestions stressed that the importance of having judges not only consider the difficulty level of individual items, but also the importance of the items themselves.

In this study a preference was given to the Informed Judgement Model, "Which deliberately emphasized the judgemental operation" (Popham 1981, P.393). Popham stressed that informed judgements, will generally be far superior to judgements made in the absence of relevant information. According to Popham the Informed Judgement Model, with myriad variations available, obliges standard setters to deliberately engage in five operations.

1. Analyze the decision context
2. Clarify the competencies
3. Acquire relevant performance data
4. Gather pertinent preference data
5. Set standards based on the information

Taking this model, as frame of reference for setting the passing score, the researcher has contacted the instructors of the course before employing the instrument. The instructors were taken as judges or standard setters for the purpose. The researcher has informed them about the significance of the

decision at issue and factors which should be considered in relation to that decision. Besides this, they were provided with the actual assessment device (the test) in order to analyze it for the purpose of securing clarification of the competency for which standard is being set. In addition, the instructors were informed to consider the performance level of their trainees. Finally the instructors have been asked not only to state their personal preferences regarding the standard or criterion but also to clarify the principal factors which guided them in their decisions.

Thus, the researcher, in order to come up with reasonable decision regarding a single standard of performance, has considered the average of the scores given by the instructors. As a result, 80 percent correct level became the standard or criterion against which the trainees knowledge was measured. Therefore, any trainee who is measured up to this criterion is said to have environmental knowledge competency, while the one who scores below the criterion is considered to have unacceptable performance.

Two extremely important characteristics of tests are validity and reliability (Bertrand and Cebula 1980). With respect to the reliability i.e, internal consistency, the test was first administered to a sample of trainees in Nazareth T.T.I. The reliability was measured by split-half estimates which was .72. Although this seems marginal, with respect to

the length of the test, this reliability coefficient appears sufficiently large to justify its internal consistency. To find out whether the test constitutes items logically reflect the knowledge domain being measured, the content validity estimate was established by the approval of content by the experts in the field. These include instructors of the course and graduate students in geography and history.

3.3.2 Attitude Inventory

The likert-type scale was employed to measure the extent to which the trainees have favourable or unfavourable feelings toward environmental problems and environmental education. Thus, the scale had two subdivisions, in which the first 10 items focused on environmental problems and the second 10 items on environmental education (see Appendix C part Three).

The likert-type scale seems to be easy to construct and administer and yield the same results as the more laboriously constructed scales (Kerlinger 1965; Gronlund 1976; Noll, Sconnell and Craig 1979; Kidd, Burrus-Bammel and Bammel 1978). This instrumental is "valid and reliable in measuring attitudes toward a variety of environmental topics" (Millward 1975, P.56).

The 10 statements about environmental problems were adopted from the New Environmental Paradigm (Dunlap and Van Liere

1978). This paradigm appears to have gained considerable popularity in academic and intellectual circles (Harman 1977; Henderson 1976). In other study it is shown that the New Environmental paradigm has sufficient reliability to warrant its continued use, and seen to be a valid measure of the environmental concern (Albrecht, Bultena, Hoiberg and Nowak 1982). The next 10 items which deal with environmental education were formulated by the researcher. During the preparation of these statements a trial test has been made to a small group of graduate students in educational psychology. They have suggested the additional or removal of items at various points in the formulation of the statements.

In general 20 items were included in the scale. Thirteen of the items were worded such that they expressed definite favourableness, while the other seven (4,6,7,9,11,15, and 17) reflected definite unfavourableness. The respondents were required to respond to each statement on a four-point scale: strongly agree, agree, disagree and strongly disagree. An even number of scale steps was used i.e., neutral scale was avoided in order to minimize the problem of response styles (Nunnally 1978).

In scoring favourable statements, the alternatives were weighed 4,3,2,1 going from strongly agree to strongly disagree. In scoring unfavourable statements, these weights were reversed. In this procedure, the scores of the items were

summed to yield an individual attitude scores with respect to the distinct attitudinal domains or subdivisions, which the study labelled as environmental problems (A_1) and environmental education (A_2). The scores of any individual, in both cases, would fall between 40 and 10. Scores above 25 will indicate a favourable, scores equal 25 a neutral and scores below 25 an unfavourable attitude. In addition, the sum of scores on all 20 item was considered to find out the trainees' attitude toward the environment in general (A_1+A_2). In here, the scores of any individual would fall between 80 and 20. Scores above 50 will indicate a favourable, scores equal 50 a neutral scores below 50 an unfavourableness attitude. Further more, to indicate the degrees of favourableness and unfavourableness toward the subject in question cutting score were set. In short, a high score indicates a highly favourable attitude, a low score the opposite.

3.3.3. Rating Scale to Determine the Acquisition of Environmental Skills

Skills cannot be easily measured via pencil-and-paper tests (Mehrens and Lehmann 1984). Eventhough direct observation and follow-up procedures seem to have advantages over other types of tools, the difficulties of finding qualified observer and of finding sufficient relevant incidents to observe, usually make measurement based on direct observation unattractive

(Ebel 1979). Besides this shortage of time on the part of the researcher made this procedure of data gathering inconvenient.

As a result, a rating scale was constructed to measure the trainees' competence in environmental skills (see Appendix C part Four). Rating scales are most helpful in evaluating procedures, products and personal-social development (Gronlund 19⁸¹~~1980~~).

The scale consisted of a listing of 17 activities selected from a wide range of activities. These activities deemed to be significant to equip learners with competence in the intellectual and problem-solving skills (Keach 1979; UNESCO-UNEP 1984, UNEP 1990).

In general, this scale was devised and administered for the purpose of securing judgements of the trainees sampled about the level of occurrence of these activities in the course. So that, to indicate the quality or status of the trainees competence with respect to environmental skills.

The activities were prepared and presented as statements on a five point scale. Values from 1 to 5 were assigned to each activity being rated. A common key was used throughout

and the key provided a verbal description as follows:

5 = Always, 4 = Often, 3 = Sometimes, 2 = Seldom,
1 = Never

In order to keep the validity and reliability of the instrument the researcher has attempted to read as many descriptions as possible on the construction and use of rating scales in educational research. In addition to this, the judgements and agreements of several graduate students were considered. Furthermore, to minimize errors in the rating scale; such as, halo effect, generosity error, central tendency error, severity error, etc., the raters i.e. the trainees were instructed the value of accurate and honest rating.

An individual ratings on all activities were added up to yield a total score and thus shows the individual's over-all judgement with regard to the level of occurrence of these activities in the course in question. Therefore, the scores of any individual would fall between 85 and 17. In which 85 is the highest possible score and 17 is the lowest possible score. Cut-off-scores on the five point scale were considered to show the trainees' judgements more explicitly. Hence, the researcher, based on the judgements of the trainees, has tried to arrive at the appraisal of the completion of the product in question.

3.3.4 Syllabus and Textbook Analysis

To determine the extent to which elaborate and significant statements of objective and content, which conform to the environmental education, occur in the course, the syllabus and the textbook of the course were studied. In this procedure attempts were made to pinpoint the important elements of environmental education. Besides this, the analysis helped the researcher to formulate the items of the test designed to check the trainees environmental knowledge.

3.3.5 Interview

To establish additional data on how the course enabled the trainees to acquire environmental education competencies, the instructors of the course at the four T.T.Is were interviewed.

To elicit the needed information from the instructors a written outline was prepared (see Appendix D). This outline included leading questions about the objectives, content, methods and activities which conform to the environmental education in the course. Besides this, questions about the role of the instructor and constraints to the integration of environmental education into the course have been included.

3.4. Administration of the Instruments

In general a 10 page questionnaire which included the test, attitude inventory and rating scale was designed to collect data from the trainees' sample. In addition to this, the questionnaire requested information on age, sex, institute, residence and existence of previous orientation in environmental education to have a clear picture of the nature of the respondents (see Appendix C part one).

Initially the questionnaire was prepared in English. Later it was translated into Amharic (see Appendix E). The translation was made by the researcher and two experts (graduate students in TEFL¹).

Regarding the administration, the sampled trainees in each T.T.I were summoned in classrooms (maximum number in a classroom was 33) to complete the questionnaire. For this purpose assistants were selected from the instructors. Before completing the questionnaire a brief orientation was given to the trainees about the purpose of the study, and they were advised to respond honestly and not to miss any item from responding. In general, the questionnaires were filled out by the trainees in the presence of the assistants under strict exam-like discipline. No time limit was fixed. However, the

¹TEFL = Teaching English as a Foreign Language.

time needed to complete the questionnaire was about 60 minutes on the average.

Four separate individual interviews i.e., one at each T.T.I with one instructor were conducted. During the interviews written notes has been taken. The researcher i.e, the interviewer faced no problems in securing the confidence and cooperation of the interviewees.

3.5 Methods of Data Analysis

All the questionnaires were returned. Each questionnaire was checked for accuracy and completeness. In the process of organizing the data each part was considered separately. Background information of the respondents was obtained and summarized (see Appendix B). In reporting the achievement on the test mark (percent-correct score) was given for each respondent. Attitudinal scores with respect to each sub-division and the whole scale were calculated. Checks on all activities in the rating scale were added up to give total score for determining the acquisition of skills. Then the following statistical methods or calculations were used for analyzing the data.

1. Percentage was used to summarize the background information; to show the acceptable performances and unacceptable performances in the test; to indicate

favourable and unfavourable attitudes and their intensity; and to present the judgements of the respondents with respect to the acquisition of skills.

2. Mean and Standard Deviation were calculated to identify the trainees' average scores with respect to each variable to be measured and to determine the extent of the scatteredness; and to find out any difference among the T.T.Is regarding knowledge, attitudes and skills.
3. Analysis of Variance (ANOVA) was employed to determine whether there is a statistically significance difference between the T.T.Is regarding knowledge, attitudes and skills in environmental education. Alpha value of 0.05 was used for all significance tests carried out in this study.
4. Intercorrelation Matrix was established to show the relationships among environmental knowledge, attitudes and skills.
5. Significance Levels of Correlations were calculated to observe whether the coefficients of correlations were resulted form chance or sampling error.

In addition to these statistical calculations, the important elements of environmental education, especially in

relation to the objectives and content, were listed in detail. Furthermore, to make the data obtained from the trainees' sample more tangible and to indicate the status of environmental education in the course, the responses, written notes taken during the interviews, to the questions in the interview were interpreted and analyzed.

CHAPTER FOUR

Presentation and Analysis of Data

4.1 The Course

Social studies includes geography and history and taught as one subject. Social studies, science and language courses are areas of emphasis where the trainees have to choose one from in addition to the other common courses given in T.T.Is. Social studies is a five credit hours course which is given for two semesters. The course has 14 Chapters in which the first 8 Chapters deal on geography and the rest 6 Chapters on history.

The following have been stated as the objectives and content relevant to environmental education in the Syllabus of Social Studies Course for Per-service Training of Primary Level Teachers (1992):

A) Objectives: The student teachers should:

1. Explain the pattern of settlement, size and growth rate of world population.
2. List some of the effects of population growth on the natural resources.

3. Explain about the need to protect and conserve the environment.
4. Describe the main economic sectors of the world.
5. Point out that there are different economic sectors in different regions.
6. Explain the relationships and interdependency between the different economic sectors.
7. Discuss the roles of trade, industry and tourism have in the development of a given county.
8. Describe the location, size and topography of Africa.
9. Identify rivers and watery bodies of Africa.
10. Discuss the interactions among climate, soil and vegetation.
11. Explain the distribution of African population form the view points of geographical location, climate, natural resources distribution and main economic sectors.
12. Discuss the geographical location and size of Ethiopia.
13. Identify rivers and watery bodies of Ethiopia.
14. List the types of climate Ethiopia has and the impact they have on the local environment.
15. Explain the distribution of Ethiopian population form the view points of the country's geographical location, climate, resources and economic sectors.

B) Content:

1. World population
 - . population growth
 - . population growth rate
 - . pattern of settlement
 - . population growth and environmental problems
2. World economy
 - . Agriculture
 - . Mining
 - . Industry
 - . Trade
 - . Transportation and Communication
 - . Tourism
3. Africa
 - . location, size and topography
 - . Rivers and watery bodies
 - . Climate
 - . Soil
 - . vegetation and wildlife
 - . population and settlement
 - . Economic sectors
4. Ethiopia
 - . location, size and topography
 - . Rivers and watery bodies
 - . Climate
 - . Soil

- . vegetation and wildlife
- . Population and pattern of settlement
- . Economic sectors



It is widely understood and seen from practice that of traditional subjects, natural and social sciences have the largest contribution for the fulfillment of environmental education objectives (Iozzi 1989; National Association for Environmental Education 1990; Gebeyehu, Yosef and Gronvall 1992; UNESCO-UNEP 1985). From this point of perspective, when we examine the social studies course of the T.T.Is, some elements of environmental education, which are listed above, have been seen in the instructional materials. Thus, it seems that the trainees are exposed to some content in environmental education.

Nevertheless, it is clearly observed that the elements related to environmental concepts are so diffused and scattered in the syllabus and the text book; that is , Textbook of Social Studies Course for pre-service Training of Primary Level teachers (1992) that their identification becomes difficult. Further, these content and learning experience are very remotely connected with the objectives of environmental education. In other words, they are found in a non-environmental context. It is noted that objectives related to environmental knowledge and environmental attitudes and values need to be highlighted in daily classroom

activities (Iverson 1976). In contradiction to this idea, no elaborate statements of objectives, except very few, which conform to the environmental education were identified in the syllabus as well as in the textbook of the course. Furthermore, the elements related to environmental dimensions are generally focused on a very limited topics such as : population; climate; soil; vegetation; rivers and wildlife, rather than broader issues of the environment and have no updated information.

According to the instructors, no conscious efforts have been made to integrate the two disciplines. Thus, the course is not the fusion of geography and history. They are simply presented independently into two parts, in which the first is geography and the second is history. Besides this, shortage of time to cover the content of the course was frequently cited by the instructors. Hence, this situation seems to pose another obstacle in the process of infusing objectives and content relevant to environmental education into the course.

In general, it appears that in the preparation of the syllabus and the textbook of social studies course of the T.T.Is, no special topics on environmental education or pedagogical approaches have been introduced other than what is usually found in geography and history programs. Especially, the history part of the course appeared to be very remotely connected with environmental education in all its aspects.

This situation seems to oppose the idea of most scholars who have related environmental education to the various disciplines (McInnis 1972; Orr in Howarth 1992; palmer 1991; Sytnik etal 1985).

4.2 Trainees' Environmental Knowledge

One of the main purposes of the study was to determine the trainees' environmental knowledge acquired from the course. For this purpose a criterion - referenced test was prepared and administered. Eighty per cent correct level was set up as a pre-determined standard or criterion, below which a trainee was considered deficient with regard to the mastery of environmental knowledge in social studies course. Results of the test are summarized in Table 1.

Table 1. Test Results with Respect to the Performance
Standard at 80% Correct Level

Institute	Acceptable Performance		Unacceptable Performance	
	f	%	f	%
Awassa N=70	26	37.1	44	62.9
Dessie N=86	46	53.5	40	46.5
Debre Berhan N=96	65	67.7	31	32.3
Harar N=69	27	39.1	42	60.9
Total N=321	164	51.1	157	48.9

Table 1 shows that 164 or 51.1% of the trainees' sample have met the criterion. Meaning that, they have passed the test. Where as 157 or 48.9% of the trainees got scores below the criterion and considered to have failed the test.

When we consider the T.T.Is separately, we observe that the majority of the trainees in Dessie and Debre Berhan have an acceptable performance. That is 53.5% and 67.7% respectively. On the other hand, in Awassa and Harar the opposite has happened. Meaning that, the majority of the trainees in these T.T.Is were found deficient.

In general it seems that the slight majority; that is, 164 or 51.1% displayed mastery as far as the test is concerned. Nevertheless, the researcher found no full evidence to say the trainees have environmental knowledge competency. Because nearly half of the trainees; that is, 157 or 48.9% appeared to fall short of the criterion. Thus, displayed an unacceptable performances. In short, no clear or large majority is seen in passing the test.

There is overwhelming research to support the fact that some basic knowledge of the environment is needed in order to promote development of desirable attitudes and to enable people to make sound environmental decisions (Fortner and Teates 1980; Fortner 1978; Moore 1981; Stamm and Bowes 1972; Cohen 1978; Ramsey and Rickson 1976; Pettus 1976). And that

is why, knowledge is included as one of the important categories of environmental education objectives (UNESCO 1978; Pettus 1976). In addition to this, in order to reach children, down to grassroots level, through our school-system and make them to think about soil erosion, deforestation, famine, etc. teacher training programs seem to be determinant. In other words, the implementation of environmental education down to grassroots level depend essentially on the training of the personnel responsible for putting the programs into effect (UNESCO-UNEP 1977). Meaning that, teachers should have basic knowledge in environmental dimensions, their attitudes towards the environment must first be changed and they must acquire skills before they attempt to reach children through the school system and make them think about environmental issues (Rissom 1981).

In view of the above notion and taking into consideration the very limited and scattered topics of environmental dimension in the course, which are relatively inefficient in developing knowledge, the researcher found no fertile ground to generalize that the trainees have environmental knowledge competency. Rather the trainees appeared to have some problems regarding the mastery of environmental knowledge in the course.

In addition to the above shortcoming, it seems that there exist a variation among the T.T.Is regarding the trainees'

knowledge. To summarize characteristics of the distribution of test scores of each T.T.I mean and standard deviation were computed (Table 2).

Table 2. Means and Standard Deviations of Environmental Knowledge Test Scores of The T.T.Is

Institute	Sum of Scores	Mean	Standard Deviation
Awassa N=70	4735	67.64	18.64
Dessie N=86	6457	75.08	15.75
Debre Berhan N=96	7640	79.58	14.83
Harar N = 69	4935	71.52	15.44

Table 2 allows us to observe the fact that there is some kind of difference among the T.T.Is in their trainees' environmental knowledge. The mean levels of Awassa, Dessie, Debre Berhan and Harar are 67.64, 75.08, 79.58 and 71.52 respectively. Thus indicated the existence of difference between them. Here again the trainees in Dessie and Debre

Berhan appear to have scored high marks. From the standard deviations we can at least, estimate how well or poorly the means represented the distributions of the test scores of the T.T.Is. In general, the greater the variability the greater the distribution's dispersion. Taking the coefficients of variation into mind, it seems that there is greater dispersion in the distribution of test scores of Awassa T.T.I. Relatively the dispersion of scores of Debre Berhan T.T.I appears to be less as compared with the others.

However, one cannot fully rely upon these statistical calculations to show difference among the groups. For instance, mean can be affected by extreme scores. Moreover, the difference among the mean test scores of the T.T.Is might be due to errors in sampling the target population. As a result an analysis of variance (ANOVA) was carried out to examine whether the obtained difference between the means is likely to have resulted from chance. The data are in Table 3, below.

Table 3. ANOVA Summary For the Environmental Knowledge
Test on the T.T.Is

Source	DF	SS	MS	F
Between	3	6345.42	2115.14	8.16*
Within	317	82163.05	259.19	
Total	320	88508.47		

*P<.01

Note:- SS = Sum of squares
 MS = Mean of squares
 DF = Degree of freedom
 F = F ratio

The ANOVA table reveals that the difference between the means of the four T.T.Is, regarding knowledge test, is not a reflection of sampling error or attributed to sampling error. Rather the table shows the existence of statistically significant difference between the mean test scores of the T.T.Is.

In summary, the trainees in Debre Berhan and Dessie relatively appeared to be in good position in their knowledge as compared with the other two T.T.Is. This might be due to different factors. For instance, the instructor in Dessie reported the attempt to modify the content to correspond with environmental education. Also he stressed the cooperation with

the instructors of the different courses. Especially science, home economics and agriculture. In Debre Berhan, according to the instructor, items related to environmental education are always included in the tests. The researcher had the chance to secure a test paper (1985 E.C) of social studies course which includes items about environmental knowledge (see Appendix F).

In fact the instructors of the course at the four T.T.Is investigated have some kind of orientation in environmental education in the form of workshops and seminars. However, the instructors in Harar and Awassa T.T.Is appeared to lack good understanding of what environmental education is and strong motivation as far as the interviews are concerned. Of course, resource materials are relatively available in Debre Berhan and Dessie T.T.Is. It was observed that in Debre Berhan T.T.I there is an environmental education action centre which could have contributed to environmental education.

4.3 Trainees' Environmental Attitudes

The possession of a certain amount of knowledge on a subject does not ensure its translation into practice. The person should have an internal inclination or interest to do or practice what he knows. Increasing knowledge alone will not significantly change attitudes and values (Kinsey 1979;

Alaimo and Doran 1980; Bart 1972; Borden and Schettion 1979).

In general, attitudes are receiving increasing attention in training and education. More and more, it is being recognized that it is not enough to concentrate upon intellectual and motor skills. That is why the cultivation of various presumably desirable attitudes is frequently mentioned as an educational objective in environmental education. Thus, in this study the researcher has attempted to develop environmental attitude profiles of the trainees.

4.3.1. Trainees' Attitudes Towards Environmental Problems

The attitude scale had two sub-scales, in which the first sub-scale focused on environmental problems . This variable; that is , attitudes towards environmental problems is denoted as A_1 . The scores of the 10 items in this sub-scale were summed to yield a trainee's attitude score. With this respect the maximum possible score is 40 - which is the most favourable response, the minimum possible score is 10 which is the most unfavourable response and the average score of the scale is 25 when averaged equals 2.5 on the scale - which is a neutral position. Besides this scores equal to or greater than 35 are considered as very encouraging and scores equal to or less than 15 as very discouraging. The trainees' attitudes are summarized in Table 4.

Table 4. Attitudes Toward Environmental Problems (A₁)

Institute	Attitude									
	Favourable						Unfavourable			
	Very Encouraging		Encouraging				Discouraging		Very Discouraging	
	f	%	f	%	f	%	f	%	f	%
Awassa N=70	2	2.8	34	48.6	11	15.7	23	32.9	-	-
Dessie N=86	8	9.3	65	75.6	7	8.1	6	7.0	-	-
Debre Berhan N=96	5	5.2	67	69.8	11	11.5	13	13.5	-	-
Harar N=69	-	-	52	75.4	3	4.3	14	20.3	-	-
Total N=321	15	4.6	218	68.0	32	10.0	56	17.4	-	-

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Table 4 indicates that of the 321 respondents:

- 233 or 72.6% of the trainees appear to have favourable attitudes;
- 32 or 10.0 % of the trainees appear to have no clear position; that is, they have neutral attitudes;
- 56 or 17.4% of the trainees appear to have unfavourable attitudes.

When we examine the degrees of favourable and unfavourable attitudes of the trainees;

- of the 233 or 72.6% of the respondents who have favourable attitudes 15 or 4.6% tend to be most favourable.
- of the 56 or 17.4% of the respondents who have unfavourable attitudes 0 or 0.0% tend to be most unfavourable.

Therefore, in light of the above result it seems that the vast majority have favourable or desirable attitudes towards environmental problems.

4.3.2. Trainees' Attitudes Toward Environmental Education

The second sub-scale was about environmental education

and contained 10 items on the subject. This variable; that is, attitudes toward environmental education is denoted as A_2 . The same cut-off-scores and procedure as the previous one were used to determine favourable and unfavourable attitudes and their intensity. Attitudes are summarized in Table 5.

Table 5. Attitudes Toward Environmental Education (A₁)

Institute	Attitude									
	Favourable				Neutral		Unfavourable			
	Very Encouraging		Encouraging				Discouraging		Very Discouraging	
	f	%	f	%	f	%	f	%	f	%
Awassa N=70	31	44.3	32	45.7	-	-	6	8.6	1	1.4
Dessie N=86	41	47.6	44	51.2	-	-	1	1.2	-	-
Debre Brehan* N=96	64	66.7	30	31.2	1	1.0	1	1.0	-	-
Harar N=69	27	39.1	40	58.0	-	-	2	2.9	-	-
Total N=321	163	50.8	146	45.5	1	0.3	10	3.1	1	0.3

* The sum of the percentages is 99.9 because of rounding up.

The major findings of Table 5 are:

- 309 or 96.3% of the respondents show positive attitudes;
- 1 or 0.3% of the respondents show neutral attitude;
- 11 or 3.4 % of the respondents show negative attitudes.

Regarding the intensity of favourableness - unfavourableness it can be observed that:

- of the 309 or 96.3% of the trainees who have positive attitudes 163 or 50.8% tend to have most favourable attitudes;
- of the 11 or 3.4% of the trainees who have negative attitudes only 1 or 0.3% tends to have most unfavourable attitude.

Thus, surprisingly, nearly all of the trainees appear to have positive inclination towards environmental education.

4.3.3. Trainees' Attitudes Toward the Environment in General

In here, all the 20 items in the scale were considered. The sum of scores on these items was taken to determine a respondent's attitude. Attitudes towards the environment

in general is denoted as $A_1 + A_2$. 80 and 20 are the maximum and minimum possible values respectively. The averaged score is 50 when averaged equals to 2.5 on the four-point scale. Scores above 50 were considered to be favourable, scores below 50 to be unfavourable and score equals 50 as neutral. Further, scores equal to or greater than 70 were taken as the most favourable and scores equal to or less than 30 as the most unfavourable attitudes. Trainees' attitudes toward the environment in general are summarized in the table below.

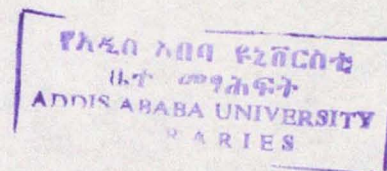


Table 6. Attitudes Toward The Environment in General (A₁ + A₂)

Institute	Attitude									
	Favourable				Neutral		Unfavourable			
	Very Encouraging		Encouraging				Discouraging		Very Discouraging	
	f	%	f	%	f	%	f	%	f	%
Awassa N=70	3	4.3	59	84.3	1	1.4	7	10.0	-	-
Dessie N=86	11	12.8	72	83.7	2	2.3	1	1.2	-	-
Debre Berhan N=96	14	14.5	79	82.4	1	1.0	2	2.1	-	-
Harar* N=69	-	-	67	97.1	1	1.4	1	1.4	-	-
Total N=321	28	8.7	277	86.3	5	1.6	11	3.4	-	-

* The sum of the percentages is 99.9 because of rounding up.

Table 6 allows us to observe the fact that of the 321 respondents:

- 305 or 95.0% of the trainees seem to have favourable attitudes;
- 5 or 1.6% of the trainees seem to have neutral attitudes;
- 11 or 3.4% of the trainees seem to have unfavourable attitudes.

Moreover, the table shows that 28 or 8.7% of the trainees tend to have most favourable inclinations and no trainee is found to have most unfavourable inclination. In general, the vast majority of the trainees appeared to have desirable attitudes toward the environment.

The trainees' attitudes in all the three cases; that is, A_1 , A_2 and $A_1 + A_2$ seem to be very encouraging and interesting. However, one cannot easily accept these results for granted. Because there are many factors to be considered before accepting.

It is reasonable to presume that measurements based on self-reports could be falsified or faked; that is, subjects could make themselves appear different from or better than, they really are (Ebel 1979; Gronlund 1976). Thus, it is desirable to supplement attitudes determine by self-report

method with evidence obtained from direct observation - which is one of the limitations of the study due to certain constraints. Further, the expression of an attitude may or may not be accompanied by associated action beyond the verbal level - which implies further investigation.

Moreover, some research has indicated that favourable attitudes about the environment are associated with specific characteristics of people such as age, sex, extra-curricular activities, school courses, and socio-economic status (Knapp 1973; Hounshell and Ligett 1973; Horvat 1977). Eventhough the idea appears conflicting, most of these characteristics are beyond the scope of this study.

Furthermore, the researcher observed that the approach of the textbook to environmental eduction seem relatively inefficient in developing attitudes. The instructors reported that no other method besides the traditional method of mere transmission of knowledge is used. The researcher does not believe that the instructors know enough about environmental attitudes or attitudes in general, at this point, to deal with changing them.

Finally, it seems there is a difference among the T.T.Is regarding the trainees' attitudes as far as the percentages are concerned (see Tables 4,5 and 6). Just to have a clear picture of the situation the means and standard deviations

of the T.T.Is for all the three cases were computed (see Table 7). In addition to this, to determine whether the differences are significant or not, analysis of variance (ANOVA) for each case was employed (see Table 8).

Table 7.

Means and standard Deviations of Attitudes Scoresof the T.T.Is

Institute	Sum of Scores			Mean			Standard Deviation		
	A ₁	A ₂	A ₁ + A ₂	A ₁	A ₂	A ₁ + A ₂	A ₁	A ₂	A ₁ + A ₂
Awassa N=70	1843	2284	4127	26.33	32.63	58.96	3.78	5.55	7.18
Dessie N=86	2486	2900	5386	28.91	33.72	62.63	3.56	3.76	5.92
Debre Berhan N=96	2713	3384	6097	28.26	35.25	63.51	3.76	3.41	5.95
Harar N=69	1843	2317	4160	26.71	33.58	60.29	3.12	3.55	4.90

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Table 7 indicates that the mean score of Dessie T.T.I regarding A_1 ; that is, attitudes towards environmental problems is greater than the other T.T.Is. Awassa T.T.I appeared to be the least, which is 26.33. The standard deviations seem to revolve around the same area. In the case of A_2 ; that is, attitudes towards environmental education, the leading role is taken by Debre Berhan followed by Dessie, next by Harar and finally by Awassa, in which the mean scores are 35.25, 33.72, 33.58 and 32.63 respectively. The dispersion seems to be greater in Awassa T.T.I as compared with the others. Regarding $A_1 + A_2$; that is, attitudes towards the environment the mean score of Debre Berhan T.T.I, which is 63.51 found to be the highest, while the mean score of Awassa T.T.I, which is 58.96 to be the least. The distribution's dispersion in Awassa T.T.I appeared to be greater than the others, which is 7.18, when compared.

At last, but not least, between the T.T.Is statistically significant differences were observed in all the three cases; that is, A_1 , A_2 and $A_1 + A_2$. These are summarized in Table 8.

Table 8. ANOVAs Summary for Trainees' Attitudes on the T.T.Is

Source	DF	SS			MS			F		
		A ₁	A ₂	A ₁ +A ₂	A ₁	A ₂	A ₁ +A ₂	A ₁	A ₂	A ₁ +A ₂
Between	3	354.56	297.92	1048.56	118.31	99.31	349.52	9.22*	5.95*	9.61*
Within	317	4063.39	5288.46	11533.16	12.82	16.68	36.38			
Total	320	4417.95	5586.38	12581.72						

*P<.01

Tables 7 and 8 suggest that trainees in Debre Berhan and Dessie T.T.Is have stronger desirable attitudes than those trainees' in Harar and Awassa T.T.Is.

In summary, some attempts have been made to measure the trainees' environmental attitudes and to develop environmental attitude profiles of the trainees. A vast majority of the trainees are found to have a very highly desirable attitudes, which the researcher underlined the need to study these results from different angles. Hence, more work appears to be needed in this area because the available information and findings alone are not comprehensive enough to provide conclusive results. However, the researcher has no ground to discredit the obtained results from the measurement.

4.4. Trainees' Environmental Skills

Viable environmental education programs are extremely concerned with the development of mental and action skills (UNESCO-UNEP 1984; Keach 1979). Of course, these skills are also identified as primary objectives for other areas of the curriculum. In short, sound knowledge about environment, and positive environmental attitudes should lead to its application in daily life. Otherwise it remains buried with no effect on the person possessing it or for others to learn from his experience.

Therefore, in this study it was found imperative to find out the trainees environmental skills acquired form the course. Thus, the trainees were asked for their judgements regarding the occurrence of the listed activities in the rating scale (see Appendix c Part Four), which deemed to be significant in the development of mental and actions skills.

As mentioned in Chapter Three an individual ratings on all activities were added up to yield a total score, in which the maximum possible total score was 85 and the minimum possible total score was 17. The following cut-off-scores on the scale were taken to show the levels of occurrence of the activities more explicitly.

Scores greater than 76.5 as always

Scores equal to or less than 76.5 and greater than 59.5
as often

Scores equal to or less than 59.5 and equal to or grater
than 42.5 as sometimes

Scores less than 42.5 and equal to or greater than 25.5
as seldom

Scores less than 25.5 as never

Therefore, the trainees' judgements are summarized in Table 9.

Table 9. Trainees' Judgements Regarding the Occurrence
of the Activities Leading to the Acquisition
of Environmental Skills

<i>Institute</i>	<i>Level of Occurrence</i>									
	<i>Always</i>		<i>Often</i>		<i>Sometimes</i>		<i>Seldom</i>		<i>Never</i>	
	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>
<i>Awassa*</i> <i>N=70</i>	5	7.1	20	28.6	19	27.1	21	30.0	5	7.1
<i>Dessie</i> <i>N=86</i>	1	1.2	39	45.3	29	33.7	14	16.3	3	3.5
<i>Debre Berhan</i> <i>N=96</i>	5	5.2	44	45.8	35	36.5	12	12.5	-	-
<i>Harar</i> <i>N=69</i>	-	-	18	26.1	30	43.5	19	27.5	2	2.9
<i>Total</i> <i>N=321</i>	11	3.4	121	37.7	113	35.2	66	20.6	10	3.1

* The sum of the percentages is 99.9 because of rounding up.

As Table 9 shows, of the 321 trainees:

- 11 or 3.4% of the trainees judged by saying always;
- 121 or 37.7% of the trainees judged by saying often;
- 113 or 35.2% of the trainees judged by saying sometimes;

- 66 or 20.6 % of the trainees judged by saying seldom;
- 10 or 3.1 % of the trainees judged by saying never.

In general 132 or 41.1% of the trainees appeared to suggest that the activities tend to be present adequately, 113 or 35.2% of the trainees suggested that the activities tend to be present inadequately and 76 or 23.7% of the trainees indicated that the activities tend to be absent. From the above data we can observe that the greater number of the trainees, as compared with the other responses, judged that the activities existed adequately. In addition, 245 or 76.3% of the trainees appeared to indicate the presence of the activities in the course, even though there is variation in their responses regarding the level of occurrence and adequacy. Thus, indicated that acquisition of environmental skills to some extent.

"In the absence of a sequence of activities leading from the awareness to the action stage, much of the effectiveness of an environmental education program is lost" (Keach 1979,P.5). In light of this, the obtained result seems to be encouraging as far as the trainees' judgements are concerned.

However, it seems that the trainees have made some kind of error in rating the activities in the scale. The researcher found many trainees' response styles to favour

continually the high end of the continuum. Therefore one has to bear this in mind when considering the trainees' judgements.

On the other hand, the researcher has secured information that enforces the trainees' judgements. The instructors reported the attempts to develop skills by listing the practical activities exercised in the course. School gardening, nursery bed preparation, tree planting, naming of plants, fish rearing, production of teaching aids, hillside terracing, preparation of recreational sites are among the listed ones. All the activities mentioned seem to focus on action skills. Where as in the area of thinking skills, like the ability to apply knowledge, analyze information, develop ideas, etc. nothing is reported besides the normal classroom instruction. Thus, indicated the absence of activities to develop thinking skills.

Of course, once can easily observe from the compounds of the T.T.Is, especially in Debre Berhan and Dessie and to some extent in Harar, the existence of practical activities. For instance, on can easily see small trees recently planted, well prepared recreational site, vegetable gardening, cleaned and beautified compound, pits for waste disposal, etc. These activities , according to the instructors, were and still are conducted in

collaboration with other courses, especially agriculture.

When we examine each of the T.T.Is, it seems that there exist a difference among them in developing skills in the course. This can be seen from the means and standard deviations of the judgement scores of the trainees. They are presented in Table 10.

Table 10. Means and Standard Deviations of the Judgement Scores of the T.T.Is

Institute	Sum of Scores	Mean	Standard Deviation
Awassa N=70	3513	50.19	17.81
Dessie N=86	4706	54.72	13.66
Debre Berhan N=96	5666	59.02	11.96
Harar N=69	3499	49.99	13.71

The above table shows that the trainees in Debre Berhan and Dessie appeared, according to their judgements, to have more opportunities to develop and strengthen environmental skills in the course as compared with the other two T.T.Is.

To find out whether the difference among the T.T.Is is significant or not ANOVA was employed. The data are summarized in the table below.

Table 11. ANOVA Summary for Environmental Skills
on the T.T.Is

Source	DF	SS	MS	F
Between	3	4595.17	1531.72	7.57*
Within	317	64116.83	202.26	
Total	320	68712.00		

* $P < 0.01$

From the ANOVA table given above, we observe that the difference between the T.T.Is is statistically significant. In general Tables 10 and 11 imply that the trainees in Debre Brehan and Dessie T.T.Is have made relatively good progress in the development of environmental skills.

In summary, based on the information obtained from the trainees judgements, and the instructors, the trainees appeared to be in good position with respect to the development of environmental action skills. Regarding

thinking or mental skills the available information and findings seem to be not comprehensive enough to provide conclusive results either positively or negatively.

4.5 Relationships Among The Trainees' Environmental Knowledge, Attitudes, and Skills in the Course

To establish relationship among the trainees' environmental knowledge, attitudes and skills was one of the objectives of this study. Thus, to examine this situation inter-correlation Matrix and significance levels of correlations were established (Table 12).

Table 12. Inter Correlations of Knowledge, Attitudes and Skills (N=321)

	K	A ₁	A ₂	A ₁ + A ₂	S
K	1.0000				
A ₁	0.3440*	1.0000			
A ₂	0.3330*	0.2594*	1.0000		
A ₁ + A ₂	0.4257*	0.7654*	0.8201*	1.0000	
S	0.0086	-0.0111	0.1155*	0.0704	1.0000

* Significant at 0.05 level or lower

Note: K = Environmental knowledge
A₁ = Attitudes towards environmental problems
A₂ = Attitudes towards environmental education
A₁+A₂ = Attitudes towards environment in general
S = Environmental skills

Table 12 presents positive correlations, except the relationship between A₁ and S (-0.01), among levels of knowledge, attitudes of different cases and skills. The relationships between A₁ + A₂ and A₁ and between A₁ + A₂ and A₂ found to be highly positive; that is, 0.77 and 0.82 respectively. The other correlations are below 0.50.

Several studies found significant relationships, especially between environmental knowledge and environmental attitudes (Fortner and Teates 1980; Fortner

1978; Moore 1981; Stamm and Bowes 1972; Ramsey and Rickson 1976). Ramsey and Rickson suggested that there is a 'circularity' between knowledge and attitudes in that one does not cause or precede the other. Instead, it seems that some knowledge may lead to an initial formation of attitudes which, in turn, may lead to further gains in knowledge.

As Table 12 shows, the relationships obtained between knowledge and attitudes in all the cases found to be statistically significant. This result appeared to be in line with those results reported by the above mentioned authorities. However, the relationships between knowledge and skills and between attitudes of different cases and skills found to be statistically non-significant.

4.6 The Status of Environmental Education in Social Studies Course

The syllabus considered in this survey appeared to have few objectives and content relevant to environmental education, though these elements did not measure up to the objectives and standards of the present day environmental education teaching. The few objectives and content identified appeared to be casual and in most cases theoretical in nature.

A number of serious constraints and difficulties to the integration of environmental topics and activities into the course have been reported by the instructors. The first of these was a lack of widely disseminated and well articulated statements of the concepts, generalizations and processes to be considered in a viable environmental education program.

The other constraints reported are:-

- the instructors face a problem in getting proper guidance to carry out some of the activities planned;
- supplementary and reference materials are not easily available;
- in some cases the instructors do not get administrative support;
- the instructors get little time for proper planning of activities;
- the insistence on completion of the syllabus places several constraints on the instructors to be innovative.

It is also reported that the conventional methods and techniques of teaching adopted at the T.T.Is are inadequate for environmental education program because of certain unique characteristics for this subject area, viz

- interdisciplinary nature of its content
- value - oriented nature
- community - oriented strategies
- student - initiated activities and investigations.

In general, few efforts have been made in the T.T.Is observed to supplement the traditional training of teachers with a view to produce a competent staff for environmental education. The limited experience and insights gained through such an exposure cannot be expected to provide the trainees with the competencies in teaching environmental concepts at elementary school level, which take the form of an interdisciplinary approach. Overall a very modest and uncoordinated teacher training effort in the area of environmental education was the rule at every institute studied in this inventory.

CHAPTER FIVE

Summary, Conclusions and Recommendations

5.1. Summary and Conclusions

This study was planned to investigate the integration of environmental education into social studies course at some selected T.T.Is of Ethiopia. It has attempted, especially, to determine whether the course helps the trainees to develop environmental education competencies, which take the form of knowledge, attitudes and skills.

To meet the objectives of the study first relevant literature related with environmental problems, education, environmental education and research findings on environmental education were assessed and studied thoroughly to be familiar with what is already known.

Criterion referenced test, attitude inventory and rating scale were prepared and employed to collect data from the trainees' sample regarding their foundational competencies in knowledge, attitudes and skills. The trainees' sample consisted of those trainees of 1992/93 academic year who studied social studies as area of emphasis at the four T.T.Is selected. The size of the sample was 321. In addition to the above techniques, the course syllabus and

textbook were analyzed, and interviews with the instructors of the course were conducted to substantiate the data gathered from the trainees.

Percentage, mean and standard deviation, analysis of variance (ANOVA), intercorrelation matrix and significance levels of correlations were used to analyze the data collected.

The study suggested that the course; that is, social studies seems to have some scattered and diffused objectives and content related to environmental education. Thus, it indicated that the trainees were exposed to some content in environmental education. However, it is found that the elements of environmental education seen in the syllabus did not measure up to the objectives and standards of the present day environmental education teaching. The elements appeared to be rather casual and theoretical in nature. No special topics on environmental education or pedagogical approaches or methods for teaching environmental issues have been introduced in the syllabus and textbook other than what is usually found in geography and history.

The slight majority of the trainees' sample displayed mastery of environmental knowledge as far as the test results are concerned. Nearly half of the trainees

appeared to be incompetent. Because they got scores below the criterion. In view of producing competent staff in developing and implementing environmental education down to the grassroots level, and taking into consideration the limited and scattered topics of environmental dimensions in the course, which are inefficient in developing knowledge, it seems premature at this stage to generalize that the trainees have foundational competency in environmental knowledge.

With regard to the attitudes, the vast majority of the trainees showed a very highly desirable inclinations toward environmental problems, environmental education and environment in general. Nevertheless, more work appears to be needed in this area. Because the available information and findings alone are not comprehensive enough to provide conclusive results. One has to be aware of the limitations of attitude scales and the difficult task of attitudinal study. Attitudes take time to nurture; environmental literacy is no short course.

According to the judgements of the majority of the trainees, obtained from the rating scale, the course seems to involve activities leading to the acquisition of environmental skills. The obtained results seem to be encouraging as far as the trainees judgements are concerned. Eventhough the trainees are found to have made

the generosity error in the rating scale, in general from what the trainees have indicated, the instructors have reported and the researcher has observed, the trainees appeared to have minimum competency in environmental action skills. With respect to mental skills no progress has been reported and seen beyond the normal classroom instruction.

Statistically significant differences were observed among the T.T.Is regarding the trainees foundational competencies in environmental knowledge, attitudes and skills. The trainees in Debre Berhan and Dessie T.T.Is appeared relatively to have stronger competencies in all the three cases.

Positive significant relationships were obtained between the trainees' environmental knowledge and environmental attitudes of the different cases. However, the obtained relationships were not highly positive in most cases. On the other hand between environmental knowledge and environmental skills and between environmental attitudes of the different cases and environmental skills no clear systematic correlations were observed and found to be non-significant except the relation between A_2 and S.

Finally, eventhough few efforts have been made in the course to develop trained environmental education personnel, a number of serious constraints and difficulties

have been reported. The first of these was a lack of elaborate statements of objectives and content which conform to the environmental education. Besides these, constraints and difficulties in respect of time, staffing, resources provision, methods and techniques of teaching, faculty cooperation and insistence on completion of the syllabus were frequently cited by the instructors of the course in question.

5.2 Recommendations

On the basis of the findings the following recommendations are made:-

1. The first thing seems to be to reform the present social studies syllabus specifications, so that to make them conform more closely to the specific objectives of environmental education. This reform may involve the revision and expansion of facts, concepts, generalizations and processes related to environmental education.
2. It is clear that the conventional method of mere transmission of knowledge adopted at the T.T.Is is inadequate for environmental programs because of certain unique characteristics for this subject area. Thus, it appears that activity-oriented and problem-

centered approaches and value and community-oriented strategies seem to be desirable. In general, a quest for a variety of methods may be successful for teaching environmental education in terms of knowledge, attitudes and skills.

3. Production of more resource materials, related with the course, giving accurate and up-to-date information and ideas regarding environmental issues for instructors and trainees appear to be a fact to be considered highly.
4. Should environmental education be a new and separate subject in the curriculum? Most educators in the world say no. They held the opinion that environmental education can be taught through the medium of other subjects. From this point of view, it seems that all courses taught in the T.T.Is need to integrate environmental education. This approach might bring faculty cooperation which gives an impetus to produce a competent staff for teaching environmental education in elementary schools.
5. It seems essential to encourage and support the trainees during their training programs to establish clubs devoted to the conservation and appreciation of the environment.



So that the findings may help schools of different levels to increase^d their efforts in teaching about environmental problems using a balanced approach.

So that the findings may help schools of different levels to increase^d their efforts in teaching about environmental problems using a balanced approach.

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Appendix A

Some Guiding Principles for Environmental Education

Environmental Education should:

- consider the environment in its totality-natural and built, technological and social (economic, political, technological, cultural-historical, moral, aesthetic);
- be a continuous lifelong process, beginning at the pre-school level and continuing through all formal and non-formal stages;
- be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;
- examine major environmental issues from local, national, regional and international points of view so that students receive insights into environmental conditions in other geographical areas;
- focus on current and potential environmental situations, while taking into account the historical perspective;
- promote the value and necessity of local, national and international co-operation in the prevention and solution of environmental problems;
- explicitly consider environmental aspects in plans for development and growth;



- enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
- relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years;
- help learners discover the symptoms and real causes of environmental problems;
- emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;
- utilize 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.

Appendix B

Background Information of the Respondents

No.	Item		T.T.I				Total
			Awassa	Dessie	Debre Berhan	Harar	
1	Sex	Male	37(52.9)	50(58.1)	67(69.8)	46 (66.7)	200 (62.3)
		Female	33(47.1)	36(41.9)	29(30.2)	23 (33.3)	121 (37.7)
		Total	70(100.0)	86(100.0)	96(100.0)	69 (100.0)	321 (100.0)
2	Age	Under 18	5(7.1)	- (-)	3(3.1)	1(1.4)	9(2.8)
		18-22	61(87.1)	75(87.2)	86(89.6)	59(85.5)	281(87.5)
		23-27	3(4.3)	11(12.8)	7(7.3)	9(13.0)	30(9.3)
		28-32	1(1.4)	- (-)	-(-)	- (-)	1(0.3)
		Total	70(99.9)	86(100.0)	96(100.0)	69(99.9)	321(99.9)
3	Place-Lived Most of the life (time)	City	11(15.7)	29(33.7)	30(31.2)	21(30.4)	91(28.3)
		Town	30(42.9)	45(52.3)	45(46.9)	36(52.2)	156(48.6)
		Village	29(41.4)	12(14.0)	21(21.9)	12(17.4)	74(23.1)
		Total	70(100.0)	86(100.0)	96(100.0)	69(100.0)	321(100.0)
4	Any Orientation or training in environmental education before joining the training program	Yes	36(51.4)	27(31.4)	41(42.7)	47(68.1)	151(47.0)
		No	34(48.6)	59(68.6)	55(57.3)	22(31.9)	170(53.0)
		Total	70(100.0)	86(100.0)	96(100.0)	69(100.0)	321(100.0)

Note: 1. The numbers in parentheses are percentage expressions.
2. Some of the total percentages are 99.9 because of rounding up.

APPENDIX C

A Questionnaire on Various Issues

Addis Ababa University
School of Graduate Studies

A Questionnaire Prepared for Trainees
in Teachers' Training Institutes

The aim of this questionnaire is to find out some relevant data about the integration of environmental education into social studies course. The data will be used for a research purpose. The information from respondents (trainees) will be confidential and will not affect anybody in anyway. After reading each question or item please answer it based on your knowledge and experience. Your frank and sincere responses will be highly appreciated. There is no need of writing your name.

Thank you for the cooperation!

Part one - Biographical Data

Instruction:- Please indicate your answer by putting a tick (✓) mark in the box provided.

1. Name of your institute:

Awassa	☐	Debre Berhan	☐
Dessie	☐	Harar	☐

2. Sex:	Male	☐	Female	☐
---------	------	--------------------------	--------	--------------------------

3. Age: Under 18 ☐ 18-22 ☐ 23-27 ☐
28-32 ☐ 33-37 ☐ 38 and above ☐

4. Place where you lived most of your life:

City ☐ Town ☐ Village ☐

5. Any orientation or training or experience in
environmental education prior joining the training
program?

Yes ☐

No ☐

Part Two - Achievement Test

Instruction: Following are multiple choice items drawn from your social studies course. Please choose and circle the best answer from the alternatives given.

- 1) The most serious environmental problem of Ethiopia is
 - a. water pollution
 - b. soil erosion
 - c. air pollution
 - d. population growth

- 2) Which of the following countries can be cited, as an example, for its efficient wildlife management?
 - a. Sudan
 - b. Ethiopia
 - c. Kenya
 - d. Djibouti

- 3) At present, the estimated percentage of the land covered by high forest in Ethiopia is
 - a. 15
 - b. 12
 - c. 9
 - d. 5

- 4) Which of the following natural resources is non-renewable?
 - a. wild animals
 - b. vegetation
 - c. minerals
 - d. soil

- 5) Which of the following wild animals is peculiar to Ethiopia?
- a. elephant
 - b. walia ibex
 - c. giraffe
 - d. tiger
- 6) In developing countries, like Ethiopia, water pollution is caused mainly by:
- a. pesticide and fertilizer residues
 - b. human excreta
 - c. industrial effluents
 - d. wild animals
- 7) The replanting of trees where forests have been cleared by man is called
- a. reafforestation
 - b. afforestation
 - c. deforestation
 - d. cultivation
- 8) How much of the Earth's surface is covered with water?
- a. 97%
 - b. 70%
 - c. 3%
 - d. 30%
- 9) Which of the following practices is useful to control soil erosion?
- a. contour ploughing
 - b. cultivation on steep slopes
 - c. overgrazing
 - d. all of the above

10) The main environmental problem in highly industrialized countries is

- a. deforestation
- b. desertification
- c. air pollution
- d. drought

11) Which of the following is man-made environment?

- a. rift valley lakes
- b. religion
- c. the Himalayas
- d. temperature

12) In the Ethiopian history, the emperor who imported seeds of Eucalyptus in order to overcome forest and woodland degradation is

- a. Tewodros
- b. Yohannes IV
- c. Menelik II
- d. Haile Sellassie I

13) Which part of Ethiopia is threatened by irreversible land degradation?

- a. Southern Ethiopia
- b. Eastern Ethiopia
- c. Northern Ethiopia
- d. Western Ethiopia

14) In Ethiopia the major effect of population growth on the environment is an increase in

- a. deforestation
- b. mineral exploitation
- c. waste gases, dust and heat from industries
- d. construction of roads, dams and buildings

- 15) In primitive communal society the few damaging actions of man against environment were probably limited to
- a. domestication of animals
 - b. hunting of wild animals
 - c. worshipping of natural phenomena
 - d. extracting of minerals
- 16) The main cause of population growth especially in Africa is
- a. emancipation of women
 - b. illiteracy
 - c. improvement of living standards
 - d. successful control of diseases
- 17) Which of the following is a means to control forest destruction in Ethiopia?
- a. reducing the rate of wildlife increase
 - b. encouraging overcultivation
 - c. increasing the livestock population
 - d. developing alternative use of energy
- 18) One of the following regions is considered to be densely populated
- a. Australia
 - b. Amazon
 - c. South East Asia
 - d. Arab States

19) Which of the following man actions facilitates accelerated soil erosion?

- a. terracing b. strip cropping
- c. check dams d. none of the above

20) One of the following statements is not true about Ethiopian Highlands.

- a. most of the soil erosion and land degradation occurs in the highlands
- b. the highlands account for some 44% of the land area
- c. the highlands account for some 30% of the population
- d. the highlands include about 69% of the country's livestock

Part Three - Attitude Inventory

Instruction:- The following statements represent opinions on environmental problems and environmental education, and your agreement or disagreement will be determined on the basis of your conception and experience of the subject in question. Kindly check (✓) your position on the scale as the statement first impresses you.

a = strongly agree

b = agree

c = disagree

d = strongly disagree

Items	Scale Values			
	a	b	c	d
A. <u>Environmental Problems</u>				
1. Mankind is severely abusing the environment.				
2. We are approaching the limit of the number of people the earth can support.				
3. The balance of nature is very delicate and easily upset.				
4. Mankind was created to rule over the rest of nature.				
5. The earth is like a spaceship with only limited room and resources.				
6. Plants and animals exist primarily to be used by humans.				
7. Humans need not adapt to the natural environment because they can remake it to suit their needs.				
8. When humans interfere with nature it often produces disastrous consequences.				

Items	Scale Values			
	a	b	c	d
9. Humans have the right to modify the natural environment to suit their needs.				
10. To maintain a healthy economy we will have to develop a "steady-state" economy where industrial growth is controlled.				
B. <u>Environmental Education</u>				
11. Environmental education is of little importance since environmental problems are clear and known.				
12. The first lesson a child need to learn is to know his local environment				
13. Teachers are among those with direct responsibilities in combating environmental ignorance.				
14. Environmental education is essential if the on-going destruction of the planet is to be stopped.				
15. Environmental education should be exclusively for future environmental specialists.				
16. I believe that it is the responsibility of teachers to show concern and care for the environment in a practical way.				
17. Environmental education is important, but it will not be my duty				
18. The training of teachers to deal with environment is one of the most urgent needs in teaching.				
19. Teachers are expected to environmentalize their teaching.				
20. Responsible citizenship can be developed through environmental education.				

Part Four - Rating Scale

Instruction:- Check (✓) in the adjoining columns how often the following environmental education activities occur (inside or outside the classroom) in the social studies course (it can also be together with other courses) during your training program.

1 = never
4 = often

2 = seldom
5 = always

3 = sometimes

Activities	Level of Occurrence				
	1	2	3	4	5
1. Group discussion on issues as population growth, poverty, management of natural resources, etc.					
2. Planting and caring for trees in the institute.					
3. Establishing environmental education corner in the library or pedagogical center.					
4. Participation in activities like tree nurseries, livestock rearing fish rearing, etc.					
5. Preparing teaching materials for environmental education, such as, teaching aids, fact sheet, brochures, etc.					
6. Studying the elementary school syllabus in attempt to identify environmental dimension.					
7. Mobilizing the local community and individual efforts to preserve forests, wildlife, the health of rivers, the soil, etc.					
8. Preparing recreation sites and carry out campus beautification. For example, collecting wastes and school gardening.					
9. Conducting surveys of the local environment to pinpoint source of environmental degradation.					

Activities	Level of Occurrence				
	1	2	3	4	5
10. Organizing practical demonstration and pilot activities, such as, hillside terracing, check-dam construction, digging of garbage disposal pits, reafforestation, etc.					
11. Using the institute mini-mass media and audio-visual aids to disseminate environmental issues.					
12. Visiting places like national park, historical sites, factory, museum etc.					
13. Collecting, recording and reporting information on specific environmental issues, such as, history, belief, health condition, etc., of the local community.					
14. Participating in group and individual assignments, such as, reading, collection of sample, project work, etc..					
15. Developing lesson and unit plans which include environmental education.					
16. Attending lectures by invited guests. For example, guests from Family Guidance Association, Ministry of Health, Ministry of Agriculture, etc.					
17. Organizing environmental clubs in the institute and other places.					

Thank you again

Appendix D

Interview Questions for Social Studies Course

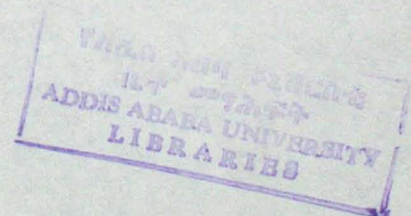
Instructors in the T.T.Is

1. What are the objectives related to environmental education that are listed in the syllabus of the course? Are they appropriate for environmental education? Are they elaborated?
2. Which chapters or topics of the content of the course are relevant to environmental education? Is there any special chapter or topic on environmental education in the course?
3. What kind of teaching methods and procedures and activities are designed in the course to teach trainees:-
 - a) environmental knowledge?
 - b) environmental attitudes and values?
 - c) environmental skills?
4. Is there any outdoor experience besides the classroom instruction?
5. What is your qualification or training or orientation in environmental education?

6. Do you co-operate with other instructors of different courses? If so how is the faculty cooperation going on?
7. What are the methods and techniques of evaluation adopted in this course for environmental education?
8. Can you explain your own personal attempts to infuse environmental education into the course?
9. What are the main constraints and difficulties to the integration of environmental education topics and activities into your course?
10. Do you have any additional thing to say about environmental education in the course in general or any recommendation regarding the development of environmental education in the course?

APPENDIX E

The Amharic Version of Appendix C



የትምህርት ፋኩልቲ

የጽሑፍ መጠየቅ

1. የተቋሙ ስም:- አዋሳ_____ ደብረብርሃን_____
 ደሴ_____ ሐረር_____

2. የታ:- ወንድ _____ ሴት _____

5. ከሚከተሉት የዱር አራዊት ውስጥ በኢትዮጵያ ብቻ የሚገኘው የትኛው ነው?

ሀ. ዝሆን

ለ. ዋልያ አይቤክስ

ሐ. ቀጭኔ

መ. ነብር

6. እንደ ኢትዮጵያ ባሉ ታዳጊ ሀገሮች ውስጥ ለውሃ ብክለት (water pollution) ዋነኛው ምክንያት?

ሀ. በእርሻ ቦታዎች ላይ የሚረጩ እንደ ፀረተባይ የመሳሰሉ ኬሚካሎች

ለ. የሰዎች በምንጭና በወንዝ አካባቢ መጸዳዳት

ሐ. ከፋብሪካዎች የሚወጡ ዝቀጭ ቆሻሻዎች

መ. የዱር እንሰሳት

7. ሰዎች በጨፈጨፉት ዛፎችና ደኖች ምትክ እንደገና ዛፍ የመትከል ሂደት _____ ይባላል።

ሀ. ሪአፎርስቴሽን (reafforestation)

ለ. አፎርስቴሽን (afforestation)

ሐ. ዲፎርስቴሽን (deforestation)

መ. ካልቲቬሽን (cultivation)

8. በውሃ የተሸፈነው የመሬት አካል መጠን ምን ያህል ነው?

ሀ. 97%

ለ. 70%

ሐ. 3%

መ. 30%

9. የአፈርን መሸርሸር (soil erosion) ለመቆጣጠር ከሚከተሉት ተግባራት ውስጥ ጠቃሚ የሆነው የትኛው ነው?

ሀ. አግድም ማረስ (contour ploughing)

ለ. ከፍተኛ ተዳፋትማ ቦታዎችን ማረስ (cultivation on steep slopes)

ሐ. የግጦሽ ሥፍራን በመደጋገም ማስጋጥ (overgrazing)

መ. ሁሉም

10. በ ኢንዱስትሪ በጣም በገፉት ሀገሮች (highly industrialized countries) ውስጥ ዋነኛው የአካባቢ ችግር (environmental problem)

ሀ. የደን ጭፍጨፋ

ለ. በረሃማነት (desertification)

ሐ. የአየር መበከል

መ. ድርቅ

11. ከሚከተሉት ውስጥ ሰው ሠራሽ አካባቢ (man-made environment) የሆነው የትኛው ነው?

ሀ. የሰሞጥ ሸለቆ ሀይቆች

ለ. ሀይማኖት

ሐ. የሂማሊያ ተራሮች

መ. ሙቀትና ቅዝቃዜ

12. በኢትዮጵያ ታሪክ ውስጥ የማገዶ እንጨት አጥረትን ለመቋቋም የባህር ዛፍ (*Eucalyptus*) ዘር ከውጭ ሀገር ወደ ኢትዮጵያ ያስመጡት መሪ
ሀ. ቴዎድሮስ ሊ. የሐንስ፲ኛ
ሐ. ዳግማዊ ሚኒለክ መ. ቀዳማዊ ሃይለ ሥላሴ
13. ከሚከተሉት የኢትዮጵያ ክፍሎች ውስጥ ፍጹም ሊሻሻል የማይችል ወይም የማይቀለበስ የመሬት መሬቆት ሁኔታ (irreversible land degradation) የሚያሰጋው የትኛው ነው?
ሀ. ደቡብ ኢትዮጵያ ሊ. ምስራቅ ኢትዮጵያ
ሐ. ሰሜን ኢትዮጵያ መ. ምዕራብ ኢትዮጵያ
14. በኢትዮጵያ ውስጥ የህዝብ ቁጥር ማደግ በአካባቢ (environment) ላይ የሚያመጣው ዋናኛው ችግር /ተጽዕኖ/
ሀ. የደን ጭፍጨፋ መጠን መጨመር
ሊ. የማዕድናት ቁፋሮ መጠን መጨመር
ሐ. ከፋብሪካዎች የሚወጡ ብናኝ ሙቀትና ዝቃጮች መጠን መጨመር
መ. የመንገዶች የውሃ ግድቦችና የሐንጸ ግንባታ መጠን መጨመር
15. በጥንታዊ የጋርዮሽ ሥርዓተ ማህበር የሰው ልጅ በአካባቢው (environment) ላይ ያደርስ የነበረው መጠነኛ ጥፋቶች ከምላ ጎደል የተያያዙት?
ሀ. እንሰሳትን ከማርባት ጋር ሊ. ከአደን ጋር
ሐ. የተፈጥሮ ክስተቶችን ከማምለክ ጋር መ. ማዕድናት ከማውጣት ጋር
16. በተለይ በአፍሪካ ለህዝብ ቁጥር ማደግ ወይም መጨመር ዋናኛው ምክንያት
ሀ. ሴቶች ከተለያዩ የህብረተሰብ ተጽዕኖች ነጻ መውጣት
ሊ. መሃይምነት
ሐ. የኑሮ ደረጃ መሻሻል
መ. የተለያዩ በሽታዎች በቁጥጥር ሥር መዋል
17. በኢትዮጵያ ውስጥ የደን ጭፍጨፋን ለመግታትና ለመቆጣጠር አንዱ መንገድ ከሚከተሉት ውስጥ የትኛው ነው?
ሀ. የዱር አራዊትን የቁጥር ዕድገት መጠንን መቀነስ
ሊ. የዕርሻ መሬቶችን በተደጋጋሚ ባለማቋረጥ ለብዙ ጊዜ እንዲታረሱ ማደፋፈር

መ. አማራጭ የሃይል ምንጭ መፈለግና ማዳበር

- | | | | |
|----|--------------|----|-----------|
| ሀ. | አውስትራሊያ | ለ. | አማዞን |
| ሐ. | ደቡብ ምሥራቅ አስያ | መ. | የዐረብ ሀገሮች |

- ሀ. እርከን መሥራት (terracing)
- ለ. የዕፀዋት መቀነቶች መሥራት (strip cropping)
- ሐ. ከትር መሥራት (checkdam)
- መ. መልሱ አልተሰጠም

- ሀ. አብዛኛው የአፈር መሸርሸርና የመሬት መራቆት የተከሰተው በከፍተኛ ቦታዎች ላይ ነው፡፡
- ለ. ከፍተኛ ቦታዎች የሀገሪቱን 44% ያህል የመሬት ስፋት ይሸፍናሉ፡፡
- ሐ. ከፍተኛ ቦታዎች 30% የሚሆነውን የሀገሪቱን ህዝብ ይዘዋል፡፡
- መ. የሀገሪቱ 69% የሚሆነው የእንስሳት ሀብት (livestock) የሚገኘው በከፍተኛ ቦታዎች ላይ ነው፡፡

መመሪያ:- ከዚህ በታች የተዘረዘሩት ዐረፍተ ነገሮች ስለአካባቢ ችግሮች (environmental problems) ና ስለአካባቢ እንክብካቤ ትምህርት (environmental education) አስመልክቶ የተሰነዘሩ አስተያየቶች ናቸው፡፡ የርስዎም በነዚህ አስተያየቶች ላይ የመስማማት ወይም ያለመስማማት የሚወስነው በተነሱት ነጥቦች ላይ ባለዎት ዕውቀትና ልምድ ላይ በመመርኮዝ ይሆናል፡፡ ስለሆነም እያንዳንዱን ዐረፍተ ነገር በጥንቃቄ በማንበብ ስለነገሩ ያለዎትን አቋም በተመለከተ በስተቀኝ በኩል በአራት ደረጃዎች በተከፋለው የመልስ መስጫ ቦታ ላይ የርስዎን አቋም

በሚያመለክተው ክፍል ውስጥ ምልክት ✓/ ያድርጉ::

የመልስ አሰጣጥን በተመለከተ

- ሀ. በጣም እስማማለሁ (strongly agree)
ለ. እስማማለሁ (agree)
ሐ. አልስማማም (disagree)
መ. በጣም አልስማማም (strongly disagree)

አስተያየቶች/ጥያቄዎች	መልስ			
	ሀ	ለ	ሐ	መ
<u>የአካባቢን ችግሮችን (environmental problems) በተመለከተ</u>				
1. የሰው ልጅ አካባቢን (environment) እጅግ አላግባብ እየተጠቀመበት ነው::				
2. መሬት ልታስተናግድ የምትችለውን የህዝብ ብዛት ቁጥር የመጨረሻ ጣሪያ በመቃረብ ላይ እንገኛለን::				
3. የተፈጥሮ ሚዛን (balance of nature) በጣም ስስና በቀላሉ የሚዛባ ነው::				
4. የሰው ልጅ የተፈጠረው ከተቀረው የተፈጥሮ ክፍል የበላይ ሆኖ ለማስተዳደር ነው::				
5. መሬት ልክ እንደህዋው መንኮራኮር (spaceship) የተወሰነ ቦታና መጠቀሚያ ሀብት እንዳላት ትቆጠራለች::				
6. በመጀመሪያ ደረጃ ተክሎችና እንስሳት የሚኖሩት ለሰዎች ግልጋሎት ለመስጠት ነው::				
7. ሰዎች ፍላጎታቸውን ለማሟላት ተፈጥሮን እንደፈለጉት ማዘጋጀት ስለሚችሉ ራሳቸውን ከተፈጥሮ አካባቢ ጋር ማጣጣም ወይም ማዛመድ አያሻቸውም::				
8. ሰዎች በተፈጥሮ ውስጥ ጣልቃ በሚገቡበት ጊዜ ውጤቱ ብዙውን ጊዜ አስከፊ ይሆናል::				
9. ሰዎች ፍላጎታቸውን ለማሟላት የተፈጥሮን አካባቢ እንዳሻቸው ለመቀያየር መብት አላቸው::				
10. ጤናማ ኢኮኖሚ እንዲኖር ከተፈለገ በኢንዱስትሪና በሌሎች ዕድገት ላይ ቁጥጥር የሚያደርግ ሚዛናዊነትና ሥርዓትን ያካተተ ኢኮኖሚ ማዳበር ያስፈልጋል::				

አስተያየቶች/ጥያቄዎች	መልስ			
	ሀ	ለ	ሐ	መ
<u>የአካባቢ እንክብካቤ ትምህርት</u> (environmental education) በተመለከተ				
11. የአካባቢ ችግሮች (environmental problems) የታወቁና ግልጽ ስለሆኑ የአካባቢ እንክብካቤ ትምህርት (environmental education) ጠቀሜታ በጣም ውስን ነው።				
12. ለአንድ ሕጻን የመጀመሪያ ትምህርት (first lesson) መሆን ያለበት ስለሚኖርበት አካባቢ (local environment) ማወቅ ነው።				
13. አካባቢን (environment) አስመልክቶ ያለማወቅን በማስወገድ ግንዛቤን ለመፍጠር ቀጥተኛ ሃላፊነት ካለባቸው ክፍሎች መካከል አንዱ መምህራን ናቸው።				
14. በጥላኔታችን መሬት ላይ የሚካሄደው የአካባቢ መውደም (environmental destruction) እንዲቆም ከተፈለገ የአካባቢ እንክብካቤ ትምህርት (environmental education) አስፈላጊ ይሆናል።				
15. የአካባቢ እንክብካቤ ትምህርት መስጠት ያለበት አካባቢን አስመልክቶ በመስኩ ለሚሰለጥኑ ሙያተኞች (future environmental specialists) ብቻ መሆን አለበት።				
16. ለአካባቢ መቆርቆርና እንክብካቤ ማድረግን አስፈላጊነት በተግባር ማሳየት የመምህራን ሃላፊነት ነው ብዬ አምናለሁ።				
17. የአካባቢ እንክብካቤ ትምህርት (environmental education) አስፈላጊ ቢሆንም የኔ ሥራ ድርሻ አይሆንም።				
18. የመምህራን ስለአካባቢ ሁኔታዎች ሥልጠና ማግኘት በማስተማር ዓለም ውስጥ በጣም አጣጣሪ ጉዳይ ነው።				
19. መምህራን በሚያስተምሩበት ጊዜ በተቻለ መጠን ትምህርቱ አካባቢያዊ ይዘት እንዲኖረው (to environmentalize their teaching) ጥረት ማድረግ ይጠበቅባቸዋል።				
20. በአካባቢ እንክብካቤ ትምህርት (environmental education) አማካይነት ሃላፊነት የሚሰማቸው ዜጎችን ማፍራት ይቻላል።				

ክፍል አራት:-ክንውኖችን (environmental activities) በሚመለከት

መመሪያ:- ከዚህ በታች የተዘረዘሩት ለአካባቢ እንክብካቤ ትምህርት (environmental education) ይጠቅማሉ ተብለው የታመነባቸው ክንውኖች (activities) ናቸው:: ስለሆነም በሥልጠና ላይ በህብረተሰብ ትምህርት ኮርስ ውስጥ /ከሌሎች የትምህርት ዓይነቶች ጋር በመተባበርና በመጣመር ሊሆን ይችላል/ የነዚህን ክንውኖች /በክፍል ውስጥ ወይም ከክፍል ውጭ ሊሆን ይችላል/ የክስተት ደረጃ ለማወቅ እንዲያስችል የክስተቱን ደረጃ ለማመልከት የተሰጡትን ቁልፍ መልሶች መሠረት በማድረግ በእያንዳንዱ ክንውን (activity) ትይዩ አንፃር በተሰጠው ቦታ በስልጠና ላይ ካጋጠመዎት ነባራዊ ሁኔታ በመነሳት የክስተቱን ደረጃ ምልክት /✓/ በማድረግ ያመልክቱ::

የመልስ ቁልፎችን በሚመለከት

- | | | |
|-----|-------------|-------------|
| 1 = | በፍጹም /በጭራሽ/ | - never |
| 2 = | እምብዛም | - seldom |
| 3 = | አንዳንድ ጊዜ | - sometimes |
| 4 = | ብዙውን ጊዜ | - often |
| 5 = | ሁልጊዜ | - always |



ክንውኖች/እንቅስቃሴዎች	የክስተቱ ደረጃ				
	1	2	3	4	5
1. በህዝብ ቁጥር ዕድገት፣ በድህነት፣ በተፈጥሮ ህብት እያያዝ፣ ወዘተ በመሳሰሉት የአካባቢ ችግሮች (environmental problems) ላይ የቡድን ውይይት ማካሄድ፡፡					
2. በተቃሙ ውስጥ የዛፍ ተክላና እንክብካቤ ተግባሮችን ማካሄድ					
3. የአካባቢ እንክብካቤ ትምህርትን (environmental education) በትምህርት ማዕከል ወይም በቤተ መጻህፍት ውስጥ ማደራጀት፡፡					
4. በችግኝ ማፍላት፣ በከብት እርባታ፣ በአሣ እርባታ፣ ወዘተ በመሳሰሉት መሳተፍ፡፡					
5. ለአካባቢ እንክብካቤ ትምህርት (environmental education) የሚሆኑ የትምህርት መረጃ መሣሪያዎችን ማዘጋጀት፡፡					
6. በአንደኛ ደረጃ ትምህርት ውስጥ ስለአካባቢ ሁኔታዎች (environmental issues) የሚገልጹ ይዘቶችን ለይቶ ለማወቅ የአንደኛን ደረጃ ሲለበስ (syllabus) ማጥናት፡፡					
7. ጫካዎችን፣ እንሰሳትን፣ ወንዞችን፣ አፈርን በመጠበቅና በመንከባከብ በኩል የአካባቢውን ህዝብ (local community) መቀስቀስና ለተግባር ማንቀሳቀስ፡፡					
8. በተቃሙ ውስጥ የመዝናኛ ቦታዎችን ማዘጋጀትና ቅጥር ግቢውን ማስዋብ /ለምሳሌ ቆሻሻ መሰብሰብ፣ አበባ መትከል/፡፡					
9. ለአካባቢ መራቆት (environmental degradation) አስተዋጽኦ የሚያደርጉትን ነገሮች ምንጭ ለይቶ ለማወቅ በቅርብ አካባቢያችሁ (local environment) ቅኝት ማካሄድ፡፡					
10. እንደክትር (checkdams)፣ እርከን (terracing)፣ የቆሻሻ ጉድጋዶች፣ ዛፍ ተክላ የመሳሰሉትን በተግባር ሠርቶ የማሳየትና የሙከራ እንቅስቃሴዎች ማካሄድ፡፡					

ክንውኖች/እንቅስቃሴዎች	የክስተቱ ደረጃ				
	1	2	3	4	5
11. የአካባቢ እንክብካቤ ትምህርት ለማሰራጨትና ለማጠናከር በተቋሙ ሚኒ ማስ ሚዲያ (Mini-Mass Media) ና እውቅና ሚዲያ (audio-visual aids) መጠቀም፡፡					
12. ታሪካዊ ቦታዎችን፣ ፋብሪካን፣ ፓርኮችን፣ ሙዚየም የመሳሰሉትን መጎብኘት፡፡					
13. የአካባቢውን ህዝብ (local community) ታሪክ፣ እምነት፣ የጤና ሁኔታ፣ የጋብቻ ሂደት፣ ወዘተ በመሳሰሉት ሁኔታዎች ላይ መረጃ መሰብሰብ፣ ማጠናቀርና ሪፖርት ማድረግ፡፡					
14. የአካባቢ እንክብካቤ ትምህርት በሚመለከት በቡድንና በግል ሥራዎችን መሥራት /ለምሳሌ ናሙና መሰብሰብ፣ ንባብ፣ የፕሮጀክት ሥራዎችን ማካሄድ፡፡					
15. የአካባቢ እንክብካቤ ትምህርትን (environmental education) ያካተተ ዩኒት ፕላን (unit plan) ና ዕለታዊ የትምህርት ዕቅድ (lesson plan) ማዘጋጀት፡፡					
16. ከውጭ ተጋብዘው በሚመጡ እንግዶች ትምህርትና ገለጻ ማግኘት /ለምሳሌ ከቤተሰብ መምሪያ፣ ከደንና ዱር አራዊት ድርጅት፣ ከምግብ ጥናት ድርጅት/፡፡					
17. በአካባቢ እንክብካቤ ላይ የሚያተኩር ክብብ (club) ማዋቀርና ማደራጀት፡፡					

በድጋሚ አመሠግናለሁ!!



APPENDIX F

ደብረ ብርሃን መምህራን ማሠልጠኛ ተቋም

የ1985 ዓ.ም. የትምህርት ዘመን የ1ኛው ወሰነ ትምህርት

ማጠቃለያ የሕብረተሰብ ሣይንስ ፈተና 40%

ስም _____ ክፍል _____ ተ.ቁ. _____

የተሰጠው ጊዜ _____

I. የሚከተሉትን ጥያቄዎች እውነት ወይም ሐሰት በማለት በመልስ መስጫ መልሱን ጸፍ/ፊ/ 11%

- _____ 1. የሕብረተሰብ ሣይንስ ትምህርት አስፈላጊነት ያለፈውን በሰው ልጅና በተፈጥሮ መካከል የነበረውን መስተጋብር ከጊዜ ጋር በማዛመድ ማጥናት ነው::
- _____ 2. አንድ ወይም ሁለት የተለያዩ ክስተቶችን በማወዳደር የምናጠናበት የህብረተሰብ ትምህርት የአጠናን ዘዴ አካባቢያዊ የጥናት ዘዴ ይባላል::
- _____ 3. ካርታና ፎቶግራፍ የሚመሳሰሉና ከፊልን ወይም ሙሉ የመሬትን ገፅታ የሚያሳዩ ስዕላዊ መግለጫዎች ናቸው::
- _____ 4. የባህር ጠለል በሁለት ባህሮች መካከል ያለውን ርቀት የምንገልጽበት የከፍታ መግለጫና በካርታ ላይ የሚሰፍር ሕጋዊ መረጃ ነው::
- _____ 5. በድንፈ ዳለም ውስጥ ያሉ አጠቃላይ አካላት ከሚልክዌይ ጋላክሲ በቀር በሰብስብ ወይም በሥርዓተ ከዋክብት ደረጃ ላይ ነው የሚገኙት::
- _____ 6. የነፋስ፣ የውቅያኖስ ጥገድ አቅጣጫና ጋደል ማለት የሚከስተው መሬት በየሃያ አራት ሰዓት ውስጥ በምታደርገው መሾር ነው::
- _____ 7. በኬክሮስ መስመር ልትነት ምክንያት የአየር ግፊት ከቦታ ቦታ ይለያያል::
- _____ 8. የአየር እርጥበት ከፍተኛ በመሆኑ ምክንያት ከዝቅተኛ ቦታዎች የበለጠ በከፍተኛ ቦታዎች ከፍተኛ መጠን ያለው ዝናብ ይጥላል::

- _____ 9. በመካከለኛው የህጋዊ ክልል የሚገኘው ዝናብ የአየር መጋጨት ዝናብ ነው።
- _____ 10. የአየር ንብረት ከቦታ መለያየት ለኢኮኖሚ ዕድገት በዓለማችን መለያየት ዋና ምክንያት።
- _____ 11. ከፍተኛ የአካባቢ ብክለት በኢንዱስትሪ ምክንያት የሚፈጠረው በመካከለኛ የህጋዊ ክልል ብቻ ነው።

II. የሚከተሉትን ጥያቄዎች ባዶ ቦታ ሙሉ/ይ/ 10%

1. የህብረተሰብ ሣይንስ ጥናት መሠረታዊ ሀሳብ _____ ነው።
2. የጽሑፍ መረጃ/በጥናትና ምርምር ውስጥ/ሁለት ዓይነት ሲሆን _____ ናቸው።
3. አንድ ካርታ አንባቢ በቅድሚያ ስለካርታው ካርታውን ከመጠቀሙ በፊት ማወቅ ያለበት፡
 1. _____ 2. _____
 3. _____ 4. _____
 5. _____
4. በካርታ ወይም በሌላ ላይ አንዳንዴ አንድ ቦታ በደቡብ ወይም በሰሜን መገኘቱን የሚያመለክቱትን በካርታ ላይ የተሳሉት የሀሳብ መስመሮች _____ ይባላሉ።
5. አፈር በወንዝና በዝናብ ከመሸርሸሩ በፊት ለመሸርሸር ሊያበቁ የሚችሉ ሁኔታዎች በአጠቃላይ _____ ይባላሉ።



III. የሚከተሉትን የህብረተሰብ ሳይንስ ቃላቶች፡ ጽንሰ ሃሳቦች ከ"ለ" ወደ "ሀ" አዛምድ ከአንድ በላይ መልስ ሊኖር ይቻላል 5%፡፡

ሀ

ለ

- | | | | |
|----------|---------------------|----|-----------------------------|
| _____ 1. | የአየር ግፊት ከፍተኛ | ሀ. | ከ23 1/2° - 66 1/2° ሰሜንና ደቡብ |
| _____ 2. | ከፍተኛ የዝናብ መጠን | ለ. | ከ0-23 1/2° ሰሜንና ደቡብ |
| _____ 3. | ዝቅተኛ የዝናብ መጠን | ሐ. | ከ66 1/2° - 90° ሰሜንና ደቡብ |
| _____ 4. | በጣም ዝቅተኛ የአየር እርጥበት | | |
| _____ 5. | በጣም ዝቅተኛ የዝናብ መጠን | | |

IV. ለሚከተሉት ጥያቄዎች ትክክለኛ መልስ የያዘውን ፊደል ምረጡ 4%

- _____ 1. በሰሜንና በሰሜን ምዕራብ ኢትዮጵያ ከፍተኛ የአፈር መሸርሸር የሚኖርበት ምክንያት

ሀ ከሌሎች የበለጠ ደኑ የተመነጠረ ስለሆነ
 ለ ትላልቅ ወንዞች የሚነሱበት ክልል ስለሆነ
 ሐ ዝናብ በሚያደርሰው መሸርሸር
 መ ሁሉም መልስ ነው፡፡

- _____ 2. "እንሊ ዋን እረዝ" በሚለው ፊልም ዋናው ለአካባቢው ብክለት ምክንያት

ሀ የሕዝብ ብዛት መጨመር
 ለ ኢንዱስትሪዎች በሚያሰወጡት ጭስና ዝቃጭ
 ሐ መሬት ያላት የተፈጥሮ ሀብት መያዝ ከሚችለው የሕዝብ ቁጥር በመኖሩና ተፈጥሮ ሚዛኗን መጠበቅ ስለማትችል፡፡
 መ ሁሉም
 ሠ ከ ሐ በስተቀር ሁሉም መልስ ነው
 ረ መልስ የለም

3. ከሚከተሉት ውስጥ አንዱ ትክክል አይደለም::

ሀ የኬክሮስና የኬንትሮስ መስመሮች በካርታ ላይ ወይም በሉል ላይ እኩል አገልግሎት የሚሰጡ ተፈጥሮአዊ መስመሮች ናቸው::

ለ አንድ ሰው ከዋልታዎች ወደ ምድር ወገብ ቢጋዝ ከአነስኛ የዝናብ መጠንና የአየር ግፊት ወደ ከፍተኛ የዝናብ መጠንና የግፊት ሃይል ይደርሳል::

ሐ የቀንና የሌሊት መፈራረቅ ዓይነተኛ ምክንያት ፀሐይ በራሷ ዛቢያ የምታደርገው ሹረት ነው::

መ ሁሉም መልስ ነው::

4. ነፋስ

ሀ በምድረ ወገብ አካባቢ ከፍተኛ የመሸርሸር ችሎታ አለው

ለ ከፍተኛ የግፊት ክልል ወደ ዝቅተኛ የግፊት ክልል ይንቀሳቀሳል

ሐ ዋና የአየር ንብረት ይዘት አይደለም ስለዚህ የአየር ንብረትን መለዋወጥ አይችልም

መ ከ "ለ" በስተቀር ሁሉም መልስ ነው

V. የሚከተሉትን ጥያቄዎች በትክክል ከነሙሉ አሠራራቸውና ማብራሪያቸው ስርተህ/ሽ/ እሳይ/ዴ/ 10%

1. በአዲስ አበባ ከተማና በደብረ ብርሃን ከተማ መካከል በአንድ 1:8000,000 በሆነ ሚዛን በተሳለ ካርታ ላይ ያላቸው ርቀት 4.5 ሳ.ሜ ሲሆን ይህ ርቀት በመሬት ላይ ስንት ይሆናል?

2. አዲስ አበባ ከተማ 40° ምሥራቅ ሰንገኝ መስፍን ዓለሙ ከጥዋቱ 4:00 ሰዓት ላይ ኒዮርክ ከተማ ያውም 74° ምዕራብ ላይ ወደ ምትገኘው ከተማ ስልክ ደውሎ ወንድሙን ሰዓት ቢጠይቅ ሊሰጠው የሚችለው መልስ ስንት ይሆናል? እንዴት አወቅህ?

3. ልክ በዚህ ሰዓት ዓሊማ መሐመድ በ79° ምሥራቅ ላይ ወደ ምትገኘው ካልካታ ደውላ ሰዓት ብትጠይቅ የሚሰጣት መልስ ስንት ይሆናል? እንዴት እወቅህ? ከእ.አ. በ4:00 ሰዓት ላይ ነው:: እ.አ በ40° ምሥራቅ::
4. በተራ ቁጥር 2 እና 3 መካከል የሰዓት ለውጥ በመልስህ ውስጥ አየህ? ለምን? አብራራ::
5. ቀጥሎ በተሰጠህ ሠንጠረዝ ያለውን ክፍት ቦታ በተስማሚ መልስ ሙሉ/ይ/

ወር	በሰሜናዊ መንፈቅ ክበብ	በደቡባዊው ንፍቀ ክበብ	በኢትዮጵያ
መስከረም - ህዳር			ፀደይ
ታህሣሥ - የካቲት	ዊንተር		
መጋቢት - ግንቦት			በልግ
ሰኔ - ነሐሴ	ሰመር		

አዘጋጅ ኪዳነ ማርያም ደምለው!