

THE ASSESSMENT OF ENVIRONMENTAL AWARENESS OF THE SECONDARY SCHOOL LEARNERS IN THE MABOPANE DISTRICT

FLORAH NNO KOMANE

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Supervisor: Prof. N.J. Vreken

Co-Supervisor: Prof. I.J. van der Walt

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ABSTRACT

TOPIC: THE ASSESSMENT OF ENVIRONMENTAL AWARENESS OF THE SECONDARY SCHOOL LEARNERS IN THE MABOPANE DISTRICT

This study aimed at assessing the environmental awareness of the learners in relation to the principles of sustainable development. This will subsequently help in formulating guidelines on how sustainable development can be achieved through Environmental Education and suggesting environmental awareness programmes for the learners. The study provided various definitions of environment, Environmental Education, environmental awareness, environmental literacy and sustainable development. The goals, objectives and principles of both Environmental Education and sustainable development are outlined. The study also discussed what the Constitution and legislations say about Environmental Education and sustainable development.

Grade 11 learners, (152) were chosen from 11 high schools and grade 9 learners (95) were chosen from 9 middle schools in Mabopane District to conduct the study. The aim was to assess the general environmental awareness of the learners across learning areas, to compare those who are doing Grade 9, which

is an exit level to Further Education and Training level to Grade 11 learners who are already at the Further Education and Training level. A questionnaire was developed for the learners to fill out in order to achieve the aims of the study. The validity and reliability of the questionnaire were determined.

The response of the learners indicated that the level of environmental awareness of the learners in Grade 11 is higher than that of the learners in Grade 9 and the learners could not provide the explanations on sustainable development and Environmental Education. Their attitude towards the environment is positive. However, they lack knowledge regarding environmental problems and are not actively involved in environmental projects or with environmental organisations.

The study finally came up with guidelines that can be used to achieve sustainable development through Environmental Education and programmes for Environmental Awareness.

OPSOMMING

ONDERWERP: ASSESSERING VAN DIE OMGEWINGS- BEWUSTHEID VAN SEKONDÊRE SKOOLLEERDERS IN DIE MABOPANE-DISTRIK

Die doel van hierdie studie was om die omgewingsbewustheid van leerders te bepaal soos gemeet aan die beginsels van volhoubare ontwikkeling. Hieruit kon riglyne geformuleer word waarvolgens volhoubare ontwikkeling bereik sal kan word deur van Omgewingsopvoeding en omgewingsbewustheids-programme gebruik te maak. In die studie word die volgende begrippe eers duidelik omskryf, naamlik omgewing, Omgewingsopvoeding, omgewingsbewustheid, omgewingsgeletterdheid en volhoubare ontwikkeling. Die doel, doelstellings en beginsels van beide Omgewingsopvoeding en volhoubare ontwikkeling is geformuleer. Die uitsprake van die Grondwet en wetgewing ten opsigte van Omgewingsopvoeding en volhoubare ontwikkeling is ook bespreek.

Graad 11-leerders (152) uit 11 hoërskole en graad 9-leerders (95) uit 9 middelbare skole in die Mabopane-distrik het aan die ondersoek deelgeneem. Die doel van die ondersoek was om die omgewingsbewustheid van leerders uit verskillende leerareas te bepaal en om 'n vergelyking te tref tussen graad 9 en graad 11-leerders. 'n Vraelys is ontwikkel om die doelstellings van die ondersoek te bereik. Die geldigheid en betroubaarheid van die vraelys is ook bepaal.

Die resultate van die ondersoek toon dat die omgewingsbewustheid van graad 11-leerders hoër is as van die graad 9-leerders. Die leerders kon verskeie vrae oor volhoubare ontwikkeling nie korrek antwoord nie. Alhoewel hulle gesindheid teenoor die omgewing positief is, is daar 'n gebrek aan kennis van omgewingsprobleme, neem hulle nie deel aan omgewingsprojekte nie en behoort

hulle nie aan omgewingsorganisasies nie. Die studie het ten slotte riglyne geformuleer wat gevolg kan word om volhoubare ontwikkeling te bewerkstellig deur Omgewingsopvoeding en programme vir omgewingsbewustheid.

CHAPTER 1

ORIENTATION OF THE STUDY

1.1 INTRODUCTION

South Africa and the developing world are faced with a multiplicity of challenges in addressing sustainable development. Amongst these are the systems that create and perpetuate the appalling levels of poverty, economic marginalization and environmental degradation affecting the majority of the world's population. To achieve sustainable development and reduce environmental degradation, South Africa needs young men and women who are sensitive towards the environment and have a sense of environmental awareness (Atchia & Tropp 1995: 11).

The right to a clean and healthy environment is enshrined in Chapter 2 that is the Bill of Rights of the Constitution of the Republic of South Africa of 1996 (RSA, 1996:16). The Bill of The Rights states that, everyone has the right:

- a. to an environment that is not harmful to their health or well; and
- b. to have the environment protected, for the benefit of the present and future generations through reasonable legislative and other measures that
 - prevent pollution and ecological degradation;
 - promote conservation; and
 - secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development

Therefore, the Bill of Rights combines the right to a clean and healthy environment with the need for sustainable development. The establishment of such a clean and healthy environment is highly dependent on the provision of quality environmental education. Seemingly, much of the environmental degradation that is experienced today is the result of the failure of our society

and its educational systems to provide citizens with the basic understandings and skills needed to make informed choices about interactions and interrelationships in the environment.

The provision of quality education is suppose to empower communities to act on environmental issues and to promote an environmental ethic (African National Congress, 1994:40) so as to take part in the wise use of the natural resources and the good management of the environment. It is therefore doubtful whether it was possible to promote a healthy environment by the kind of education that was content based offered in the previous education departments in South Africa.

The Reconstruction and Development Programme (RDP) included many elements of Agenda 21 and sustainability, such as environmental awareness and training. It was the obligation of the Reconstruction and Development Programme to increase environmental consciousness among the young, to coordinate environmental policy at all the levels, to empower communities to act on environmental issues and promote an environmental ethic. South Africa needs, as the basis for implementing sustainable development, a common understanding and vision.

The goals of the Reconstruction and Development Programme are seen clearly in the White Paper on Education and Training (Republic of South Africa, 1995:17) which states that environmental education, involving an interdisciplinary, integrated and active approach to learning, must be a vital element of all levels and programmes of the education and training system, in order to create environmentally literate and active citizens and ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources. It is therefore the obligation of formal education to ensure that all the learners in South Africa contribute to the care and wise utilisation on the natural resources (Maila, 2000:9).

This can be attained through environmental education and awareness. In addition, Agenda 21 promotes the reorientation of education towards sustainable development, surviving to achieve increased public awareness in environmental education and integrating environmental education in all educational programmes. Furthermore, chapter 25 of Agenda 21 for Sustainable Development acknowledges that the active role of young people in the protection of the environment and their involvement in decisions on environment and development. Development plans must ensure that the future of the young people is secured. This future must include the healthy environment, improved living standards, education and jobs (Nightingale, 1987: 45).

In addition to the provision of quality education, a healthy environment is also influenced by the behavioural patterns of the people (Grieve & Van Staden, 1985:135). Subbarini (1998:242) states that an environmental crisis is the crises of environmental education. It is the diverse nature of human activities that lead to environmental transformation and degradation and this requires the use of every possible means to change the behaviour of the individuals. Therefore the solution to environmental problems is a combination of the change in human behaviour towards the environment and quality education. Environmental Education may provide the motivation to shape behaviour so as individuals act in a more consistent way with sustainable development. This may also enable the citizens to make wise use of the environment and its resources.

There are many global environmental problems that are been experienced such as pollution, deforestation, extinction of biodiversity, desertification and depletion of natural resources. These global environmental problems need to be understood by the learners so as to be able to come up with solutions to successfully deal with them in future. They should be aware of their causes such as urbanisation, industrialisation, the use of harmful substances, natural disasters and the use of some modern technology (Firth, 1995:59).

It should also be noted that these problems are the result of people's attitudes towards the environment. Firth (1995:59) is of the opinion that education should aim to engage students in the exploration and the resolution of environmental issues and to foster environmental and ethical awareness, values and actions to promote lifestyles that are compatible with sustainable and equitable use of resources. The youth must have favourable public attitudes towards environmental movements.

To maintain a healthy environment, there is a need for a combination of desirable attitudes and behaviour patterns towards the environment and knowledge of ecology. According to Rockcastle (1989:8) the vast majority of the people, including the students are not aware of the most basic interactions between humans and the environment and this can lead to environmental destruction. Therefore, environmental awareness and literacy is a key to repairing the damage of our earth caused by too little knowledge. Environmental awareness can be achieved through planned learning programmes, which will impart knowledge, skills, values and attitudes in order to develop responsible lifestyles that are in harmony with the environment (Firth, 1995: 58).

Firth (1995:58) points out that environmental problem will increase unless the people are educated with an environmental ethic, an ethic that assumes that all the persons, present and future, are entitled to equal respect and a share of the benefits of the environment. Environmental Education acquired by the learners will lead to the improvement in the quality of the environment and quality of life for all. There is a dire need to empower the learners to participate in environmental improvement and protection.

The need to create an informed decision-making public to deal with environmental issues demands urgency for education for the environment without any compromise. This is mainly for the fact that the children of today are the decision makers of tomorrow. They must clearly understand how important

the environment is in order to make the right decisions about their country in future. It is also of utmost importance for them to understand which actions may be detrimental to the environment (Ariasingam, 1999: 17).

Environmental literacy is a vital aspect towards achieving a clean and healthy environment. It is a crucial component of knowledge to help the learners to make sound decisions on the environment. This could help to increase the pressure, which may slow the pace of environmental change. Environmental literacy will increase environmental awareness that will motivate the learners to donate time, energy and resources towards the solutions of environmental problems. It will also help to achieve a sustainable future for all so that the present and the future generations can share the resources of the environment. Therefore, there is a need for the society at large to become environmentally literate (Shongwe, 1997:3).

There is also a need for the educators to teach in an environmentally directed way. This will help the learners to acquire an awareness and knowledge about environmental problems in order to take action against these problems. It will also change their attitudes towards the environment by thinking globally and acting locally and develop them into critical thinkers, social inquirers and problem solvers. Teaching about and for the environment can be a vehicle for the development of environmental awareness and consciousness. This will result in the better understanding of the links between the elements of the biophysical and socio-political environment and the awareness of and concern for the total health of the planet and its people (Rajalakshim, 1994:10).

In conclusion, the provision of quality education that includes environmental knowledge, attitudes, behaviour patterns, environmental literacy and environmental ethic are needed to maintain the quality of the environment. Learners should be engaged in the different aspects of Environmental Education. Environmental Education can help the learners to become citizens who are

environmentally knowledgeable, skilled and dedicated individuals who can work towards improving or maintaining the quality of the environment. Therefore, there is an urgent need for Environmental Education programmes for the learners and well-trained educators in Environmental Education (Hungerford, *et al*; 1980:43)

This chapter aims at providing the statement of the problem, the aim of the study, the research methodology and the proceeding chapters.

1.2 PROBLEM STATEMENT

Environmental awareness is of fundamental importance towards ensuring sustainable use of resources and sustainable development. Today's learners are the leaders of tomorrow and they must therefore be equipped with environmental knowledge to effectively manage resources and to see to it that the principles of sustainable development are realised. Lack of environmental awareness and insufficient information will hamper the use of resources in an environmentally responsible way and sustainable development.

It is realised that most of the learners at middle and high schools in the Mabopane District, north of Pretoria lack the basic knowledge with regard to the need in preserving, protecting and conserving the environment. They do not understand the care for the environment. This is evident in schools where there are elements of littering, soil erosion, mismanaging of both the natural and physical resources and limited creative participation in environmental campaigns, projects and programmes by the learners. These learners need to be conscious about the environment and learn to be sensitive towards the environment. It is of utmost importance for the learners to be taught through environmental awareness programmes to be responsible citizens. This study attempts to assess the environmental awareness of the middle and high school learners in the Mabopane District.

1.3 AIMS OF THE STUDY

- Assess environmental awareness of the learners in relation to the principles of sustainable development.
- Formulate guidelines on how sustainable development can be achieved through Environmental Education.
- Suggest environmental awareness programmes for the learners.

1.4 RESEARCH METHODOLOGY

1.4.1 LITERATURE REVIEW

In the review of the relevant literature a thorough study of sources was made to gather information about environmental awareness, its relationship with sustainable development and Environmental Education. Literature was also used to suggest environmental awareness programmes and some recommendations on how to improve environmental awareness of the learners. The following terms were used to guide this study:

- Environmental Awareness
- Environmental Education
- Environmental Literacy
- Sustainable Development

1.4.2 EMPIRICAL RESEARCH

A questionnaire was designed and distributed to the target groups, who are learners in Grades 9 and 11. The aim of the questionnaire was to assess the level of environmental awareness of the learners.

1.5 DATA ANALYSIS

Percentages, tables and graphs will be used in the presentation and analysis of data.

1.6 DIVISION OF CHAPTERS

Chapter 2: The relationship between Environmental Education and Environmental Awareness.

Chapter 3: Environmental Awareness and Sustainable Development

Chapter 4: Empirical Research

Chapter 5: Summary, Final Conclusions and Recommendations

CHAPTER 2

THE RELATIONSHIP BETWEEN ENVIRONMENTAL EDUCATION AND ENVIRONMENTAL AWARENESS

2.1 INTRODUCTION

Hale (1994: 91) points out that the current environmental challenges such as climate change, ozone layer depletion and the loss of biodiversity must be taken seriously. Environmental Education and awareness are needed to be able to identify these environmental challenges and to attempt to come up with appropriate solutions. This chapter looks at various definitions of environment, Environmental Education, its aims and objectives, principles and benefits of Environmental Education and environmental awareness. It also examines a close link and relationship between Environmental Education and awareness. To discuss the relationship between Environmental Education and environmental awareness, it is of vital importance to define both concepts and to begin with what the environment itself is.

There is no worldwide consensus about the definition of the concepts environment and Environmental Education. Maybe, the understanding of the concept environment will lead to the better understanding of Environmental Education. Therefore, an attempt will be made to explain the concepts environment and Environmental Education.

2.2. THE CONCEPT ENVIRONMENT

According to Le Roux (2002:18), the environment includes, but is not limited to:

- plants and animals
- soil, air and water

- the people
- interaction
- political and economic forces
- human, cultural and social systems

The National Environmental Management Act No. 107 of 1998 (Department of Environmental Affairs and Tourism, 1998:3) defines the environment as the surroundings within which humans exist and that are made up of:

- The land, water and atmosphere of the earth;
- Micro organisms, plant and animal life;
- Any part or combination of the above and the interrelationships among and between them; and
- The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well being.

According to Irwin (1993) environment is the biophysical environment that is plants and animals and other natural resources.

The Webster's Collegiate Dictionary (1977) defines environment as an aggregate of all surrounding things, the external conditions and influences affecting the life and the development of organisms.

The World Book Encyclopaedia (1992:292) defines the environment as everything that is external to an organism.

According to Vreken and Rens (1997: 9) environment comprises of the natural, social and personal environment, which are interacting and interdependent.

Natural environment refers to living things and their interrelationship with the non-living things such as the sun, air, water and earth, while the social environment includes humans and human-created world of buildings, farms and culture. The personal environment is one's physical, intellectual, emotional, spiritual and ethical self.

There is a model (Figure 2.1) that reflects the holistic view of the environment, which emphasises sustainable management, use of support systems, strategies to solve and prevent environmental problems. These environmental problems are the result of political, social and economic aspects of our lives. They are also related to biophysical support systems namely soil, water, air, plants, animals and ecosystems in which they interact. The centre of Figure 2.1 indicates that the environment as it interacts with the social, economic and political dimensions, resting upon a base of biophysical life support systems.

It also indicates the inter-relationship between the socio-political, socio-economic and socio-ecological concerns, all of which influence sustainable living. The model suggests that the scope of Environmental Education includes conservation, development, peace and democracy. Finally it indicates that environmental problems can be better understood with reference to the social, economic, political and lifestyle choices. In essence environment includes biophysical, social, economic and political factors and communities to practice conservation, development, peace and democracy for sustainable living.

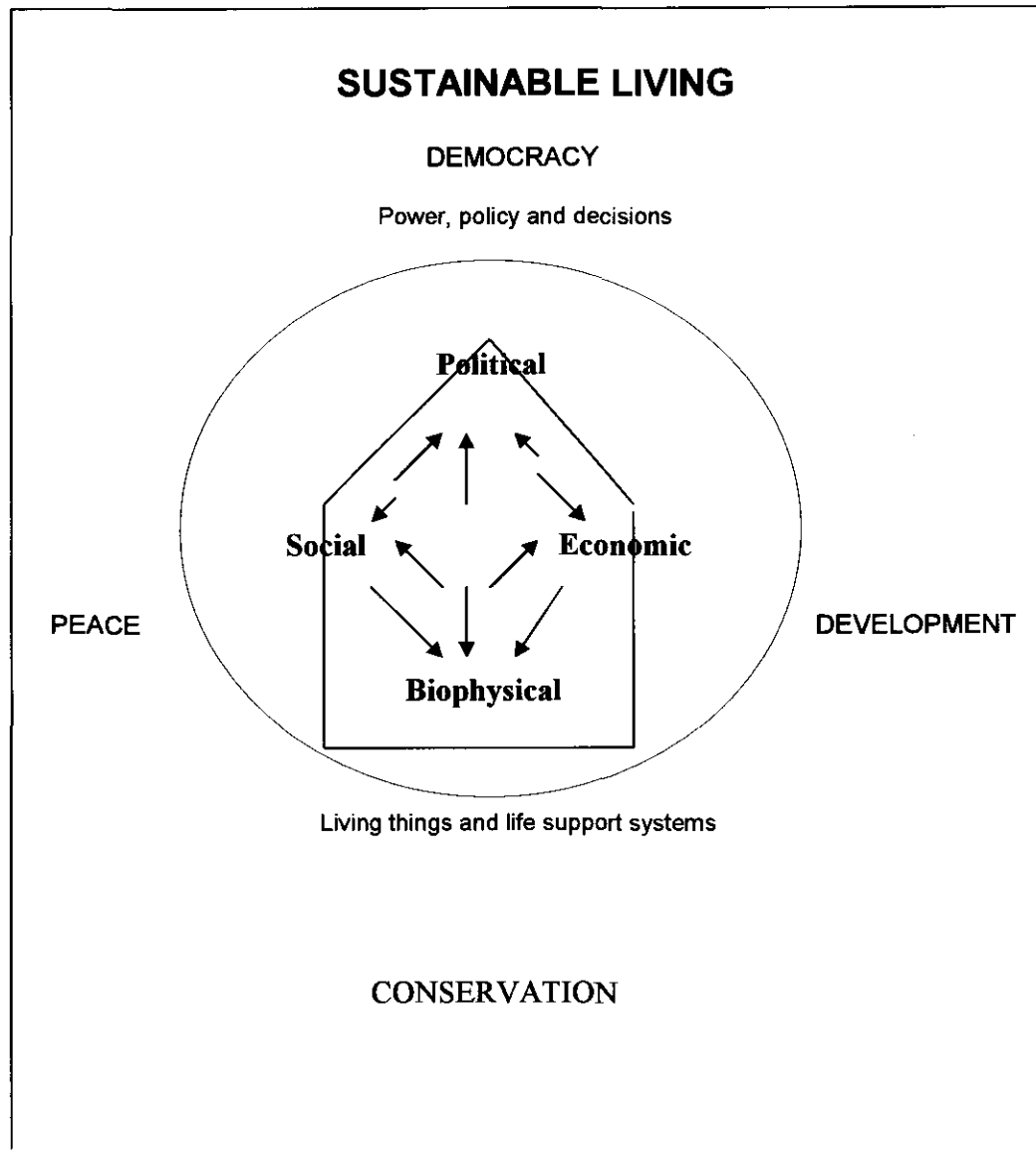


FIGURE 2.1: A DIAGRAMMATIC REPRESENTATION OF THE ENVIRONMENT (Loubser *et al.*, 1996:5)

Environment is also the land, water and the atmosphere of the earth. The surroundings, which influence and affect growth, development and the existence of living things (Annual Report, 2001: 1). Finally environment encompasses the social, political, economic, and ecological as well as the biotic and abiotic

components of ecosystem. Most importantly, it is how man interacts with the environment in which he lives. It is of crucial importance to know the environment in which one lives and how to conserve and protect it (Annual Report, 2001:2). Therefore, environment includes all the spheres of life as well as living and non-living organisms. It is the people, their communication networks, ethics and values, culture and tradition, their surroundings (physical and non-physical) and how they interact with it. It is realised that the different definitions of environment provided by different authors are influenced by their perceptions, views and backgrounds.

For the purposes of this study environment is defined as the biotic and abiotic organisms, all influences (social, political, economic and cultural) and how man interacts with ecosystems.

2.3 THE CONCEPT ENVIRONMENTAL EDUCATION

There are many definitions of Environmental Education and no single, adequate definition is accepted. It has been difficult to define it because of the nature of its content, diversity of approaches and attitudes among environmental educators.

Environmental Education is a process of recognising the values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the relationship of man, his culture and the biophysical surroundings. It is seen as a life long process that prepares people for their lives as members of the biosphere. It is also learning to understand, appreciate, work with and sustain environmental systems in their totality (Gough, 1992: 20).

Again, Environmental Education is defined as the relationship between nature and society by providing information on the impacts that societal systems have on both the biotic and abiotic parts of ecosystem (WWF Tanzania Environmental Education Programme, 2001:12).

Environmental Education is the relationship between children and their environment and the influence they are able to bring to bear upon it (Palmer, 1998:5). Environmental Education is one of the ways to achieve the rational use, management and conservation of the environment (Palmer, 1998:6).

The International Union for the Protection of Nature and Natural Resources states that Environmental Education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings (Southern African Institute of Environmental Assessment:2003:15).

Lebeloane (1998: 38) concurs that Environmental Education entails the practice in decision-making and self-formulation of the code of behaviour about issues concerning environmental quality. It is the study of factors of the ecosystem, mental and physical health, cities and population pressures.

Vreken and Rens (1997:10) point out that Environmental Education is an ongoing process that deals with values that seek to develop within people a desire to care for their environment. It also provides the knowledge; concepts and skills necessary for people to make informed decisions and take responsible action that will result in the greater well being of our planet and its people.

According to Nightingale (1977:6) Environmental Education is a study of the factors influencing ecosystems, mental and physical health, living and working conditions, decaying cities and population pressures. Its intension is to promote among citizens the awareness and understanding of the environment, our relationship to it and the concern and responsible action necessary to ensure our survival and to improve our quality of life.

Loubser *et al.* (1996:9) defines Environmental Education as education which develops in man recognition of his responsibility to maintain the environment in a manner fit for life and fit for living in an environment of beauty and bounty, in which man lives in harmony.

The International Union for the Conservation of Natural Resources (IUCN: 1971) points out that Environmental Education is a process during which values are discovered and concepts explained in order to develop skills and attitudes pertaining to an appreciation of the relationship between man, his culture and his biophysical environment. It also includes the practice of decision-making and the formulation of a personal code of conduct on matters affecting the quality of the environment (Loubser *et al.*; 1996:10).

Stapp and Cox (1979:3) define Environmental Education as a process aimed at developing a world population that is aware of, and concerned about, the total environment and its associated problems, and has the knowledge, attitudes, motivation, commitments and skills to work individually and collectively towards solutions of current problems and prevention of the new ones.

Le Roux (2002:52) maintains that Environmental Education is a systematic and structured process of exploring and sharing information about our surroundings and activities in order to achieve a better understanding of the environment and the interventions necessary to enhance its sustainability.

Hurry (1982:39) stipulates that Environmental Education is a process leading to the acquisition of environmental knowledge and the development of attitudes, values and patterns of behaviour, which reflect a concern for the health of the total environment as well as for the quality of life of all its inhabitants.

Hopper (1988:15) defines Environmental Education as a multidisciplinary approach to teach the inter-relationship between people and their natural and man-made environment.

According to Fien (1993:12) Environmental Education includes the following:

- A tool to help people to understand and deal with environmental problems and help create sustainable society;
- The intellectual tasks of the critical appraisal of environmental situations and the formulation of a moral code concerning such issues;
- The development of a commitment to act on one's values by providing opportunities to participate actively in environmental improvement.

In summary, Environmental Education is a process, which is holistic and involves the cognitive; the affective and psychomotor domains of human development in order to identify problems, find solutions and prevent new ones. It incorporates exploring and acquiring knowledge, skills, values and attitudes that may be used to recognise the interrelationship of the people and their environment, which can be natural or man made. It also contributes to the development of environmentally literacy as Environmental Education can guide individuals and groups in making wise decisions in maintaining the quality of the environment and the quality of life.

It seems the various definitions of Environmental Education outlined above have similarities that include the interaction between people and their environments, awareness of the environment, understanding of the environment, development of the code of behaviour, development of skills, attitudes, values, environmental knowledge, motivation and improvement of the quality of life and environment.

For the purpose of this study Environmental Education is education for the environment (environment as defined in 2.2), sustainable development and to develop informed and skilled citizens who are committed to solving

environmental problems. It means to develop in people understanding, awareness, values, commitment and skills necessary to manage environmental problems and issues consistent with sustainable development.

2.3.1 GOALS OF ENVIRONMENTAL EDUCATION

There are various goals of Environmental Education. The close link between environmental awareness and Environmental Education is evident in the goals of Environmental Education which are outlined below:

- To foster awareness of and concern about economic, social, political, ecological and inter-dependence in urban and rural areas.
- To provide an opportunity to acquire the knowledge, values, attitudes, skills and commitment needed to protect the environment.
- To create new patterns of behaviour to be internalised by individuals, groups and society as a whole, towards appreciating the beauty of the environment.
- Develop the knowledge, understanding and skills necessary to discuss environmental issues.
- Understand the world and the part natural resources play and the possibilities of protecting and managing environments.
- Examine and interpret the environment from a wide range of perspectives.
- To be able to solve local and global environmental problems such as soil erosion, pollution and overpopulation.
- To encourage people to be environmentally responsible.
- Promote sustainable livelihoods.
- To influence personal lifestyle choices and socially responsible living conditions.
- To enhance environmental awareness and caring actions.
- To provide a clear understanding of the interaction between the people and the environment.

- To help the learners to become environmentally literate, that is being knowledgeable and skilled about environmental information
- Help the learners maintain a dynamic equilibrium between the quality of life and the quality of the environment.
- To prepare individuals to be responsive to a rapidly changing technological world, to understand contemporary world problems and provide skills needed to play a productive role in improving and protecting the environment.
- To develop a coherent body of knowledge about the environment, built and rural, sufficient to recognise actual and potential problems.
- To be able to gather information from or about environment independently or as part of the co-operative activity.
- To be able to consider different opinions related to environmental issues and to arrive at a balanced judgement.
- To appreciate the ways in which environmental issues are interrelated so that one factor affects others.
- To be able to evaluate information about the environment from different sources and to try to resolve environmental problems.
- To be able to understand and to know how to use mechanisms available in society for cause of environmental change.
- To develop an attitude of concern for environmental matters and a wish to improve environmental understanding.
- To be critical of one's own environmental attitudes and to take steps to change one's behaviour and actions.
- To have a desire to participate in initiatives to care for or improve the environment
- To wish to participate in environmental decision-making and to make opinions known.

(Le Roux, 2002: 23); (Ahmad, 1994:51).

In summary, Environmental Education aims to develop knowledge, gather information, consider different opinions and make sound judgements, appreciate

the interrelatedness in nature, evaluate information, solve environmental problems, develop a good attitude towards the environment, cultivate responsible behaviour and develop a desire to participate in decision making. It also helps to understand the nature of environmental problems and the need for a responsible environmental behaviour.

The crucial aim of Environmental Education is to produce environmentally literate citizens, who have the awareness, knowledge, values, attitudes, commitment, skills and responsible environmental behaviour to improve and maintain the quality of the environment. It fosters the greater understanding of environmental problems to stimulate action that would lead to sound management of the available natural resources. It can be stated that Environmental Education is action orientated because it fosters teamwork and cooperation among the learners through action. Loubser *et al.* (1996:46) maintains that Environmental Education must be continuous, must pervade all subject and learning areas at all grade levels, and must offer students experiences which are as concrete and direct as possible. It is the perfect tool to achieve environmental awareness among the learners.

2.3.2 THE OBJECTIVES OF ENVIRONMENTAL EDUCATION

The researcher saw the need to outline the objectives of Environmental Education because objectives are more specific, operational, can be attained and evaluated. The following are the five categories of Environmental Education objectives as outlined by the Tbilisi Conference:

- Awareness: Helping the learners to acquire awareness and sensitivity to the total environment and its problems, develop the ability to perceive and discriminate among stimuli and use this new ability in a variety of contexts.

- **Knowledge:** Helping the learners to acquire basic understanding of how the environment functions, how people interact with the environment, how environmental problems arise and how to solve such problems.
- **Values and Attitudes:** Helping the learners to acquire a set of values and feeling of concern for the environment and the motivation and commitment to participate in environmental maintenance and improvement.
- **Skills:** Helping the learners to acquire the skills needed to identify, investigate and contribute to the resolution of environmental issues and problems.
- **Participation:** Helping the learners to acquire experience in using their acquired knowledge and skills in taking thoughtful, positive actions towards the resolution of environmental issues and problems (Hungerford & Volk, 1990: 8-9; Vreken & Rens, 1997:14).

These objectives of Environmental Education can provide a well-built foundation to support it and focus on responsible environmental behaviour. In addition, the objectives of Environmental Education are clearly reflected in the aspects of environmental literacy. They indicate that the aspirations of Environmental Education go beyond developing the learners' knowledge and awareness of environmental concerns to active participation to resolve environmental problems. These objectives may also give Environmental Education a better direction. For the goals and objectives of Environmental Education to be effectively achieved, there is a need for the guiding principles of Environmental Education (Mistral, 1994:36).

2.3.3 GUIDING PRINCIPLES OF ENVIRONMENTAL EDUCATION

The guiding principles of Environmental Education will enable the accomplishment of its goals (aims) and objectives. However, applying these principles has proved through time to be a great challenge, taking into account the serious environmental problems experienced in modern world today. These guiding principles of Environmental Education specify the direction in which Environmental Education should be organised. They will provide this study with the theoretical perspective of how Environmental Education should be approached.

The following are such guiding principles:

- Environment should be considered in its totality, that is the natural and man made technological, social, economic, political, cultural, historical, moral and aesthetic factors of the environment.
- Treat Environmental Education as a continuous life long process.
- Environmental Education is inter-disciplinary in its approach.
- Give the learners insight of dealing with the environmental issues from local to international levels.
- Focus should be put on the current and potential environmental situations
- To promote the value and necessity of local, national and international co-operation in the prevention, abatement and solution of environmental problems.
- To explicitly consider environmental aspects in plans for development and growth.
- To enable the learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences.
- To relate environmental knowledge and skills with clarifications.
- To help the learners to discover indicators of environmental problems.

- To develop critical thinking and problem solving skills on environmental aspects
- To utilise diverse learning environments and a broad array of educational approaches to teaching/learning processes with emphasis on practical activities and first hand experiences on environment

(Le Roux, 2002:283)

The above guiding principles of Environmental Education will help in enhancing environmental awareness of the learners. They emphasise enquiry and discovery methods, provide a range of learning experiences including outdoor learning experiences and involvement of the learners in identifying problems and improvement of the quality of the environment. They can be used to empower people and develop a sense of responsibility towards the environment. They can also be used in the selection of the content and methodology for environmental education programmes they will also guide and help the educators to successfully attain the goals of environmental education and thus improving the learners' environmental awareness.

2.4 THE CONCEPT ENVIRONMENTAL AWARENESS

There is a close link and relationship between Environmental Education and environmental awareness. Environmental awareness is defined as a process of equipping people with knowledge and skills, which make them informed and interested in the environment. It also involves the understanding of how man interacts and how man is affecting the environment. Environmental awareness will produce environmentally knowledgeable and well-informed individuals who have keen interest of what is happening to the environment and participate in solving environmental problems (Swedish International Development Cooperation Agency, 1999:32).

Environmental awareness will help learners to acquire an awareness and sensitivity to the total environment and its allied problems. It will also help them to cultivate a positive attitude towards the environment. Environmental Education is one of the basic means of creating environmental awareness among the learners (Swedish International Development Cooperation Agency, 1999:33). It is therefore enjoyable, interesting and rewarding to be environmentally aware.

Environmental awareness provides an opportunity to understand the principles, goals and objectives related to sustainable development and encourage personal action to achieve sustainable development. It also helps to identify possibilities for sustainable development. Environmental awareness will cultivate attitudes and practices that are consistent with sustainable development. It will help the learners to understand matters relating to sustainable development such as the following:

- An understanding of ecological and economic principles;
- Critical analysis of the relationship between ecological and economic principles which relate to sustainable development;
- Promote values and personal actions which are integral to the achievement of sustainable development;
- Encourage active participation in decision-making regarding sustainable development;
- Economic, political, social and environmental forces are fundamental to sustainable development;
- An understanding of the interdependence of life forms;
- A commitment to protect and improve the environment;
- An understanding of interdependence and interconnections of humans and the environment;
- Environmentally friendly behaviour patterns;
- Improvement of the quality of life and the environment.

Environmental Education fosters ecologically sound and equitable societies that live together in interdependence and diversity. It should embrace the three fundamental aspects of sustainable development, which are economic, social and ecological aspects.

For the purpose of this study environmental awareness is sensitising the people about the environmental conditions and issues of concern related thereto, with the view of creating a culture of environmental responsibility and soliciting their contribution to environmental management activities.

2.5 THE ADVANTAGES OF ENVIRONMENTAL EDUCATION AND ENVIRONMENTAL AWARENESS

The following will be the short term and long term benefits and advantages of Environmental Education and awareness. The present and future generations will benefit out of the knowledge gained from Environmental Education. It should be noted that one of the goals of Environmental Education is to be able to identify environmental problems, their symptoms and being in a position to come up with relevant solutions to such environmental problems. It is essential for the learners to be able to avoid or reduce the impact of their activities on the environment and where there are impacts they should be able to suggest mitigation measures (WWF Tanzania Environmental Education Programme, 2001:28).

Environmental Education plays a significant role in enabling people to solve environmental problems. The advantages of Environmental Education and environmental awareness are intertwined and closely related. They are outlined as follows:

- Spread messages on the conservation and protection of the environment.
- Lead to active participation of the learners in various environmental programmes.

- Participate in the cleaning up activities of places such as parks.
- Familiarising and making the learners aware of the richness of their planet and the need to protect it before it is too late.
- Stimulating the process of inquiry about nature in young minds.
- Enhance cleaner production and improved environmental performance.
- Enabling people to use alternative technology that is environmentally friendly.
- Promote the learners' involvement in improving the urban environment.
- Encourage the learners to recycle and reuse resources.
- Motivate the learners to follow (take) careers in environmental management and conservation.
- Cultivate interest among the learners about the environment and related issues.
- Encourage the learners to take part in days such as World Environmental Day.
- Show economic, political and ecological interdependence of the modern world.
- Help to develop a sense of responsible use of resources regionally and among the countries.
- Help the learners to change their consumption patterns and later on change their production attitudes.
- Reduce the use of resources and the impacts of the activities on the environment.
- Learners will be in a position to better manage existing resources to reduce waste, use less energy and facilitate reuse and recycling.
- Teach the learners ecologically sound practices.
(Annual Report, 2001:28, Nehru Foundation for Development)
- Environmental Education develops an awareness of environmental issues and problems.

- Environmental Education equips individuals with knowledge, insight, skills, values, attitudes and morals for addressing environmental problems.
- Enable the learners to use their environment carefully, harmoniously and in a sustainable way.
- Enable the learners to play an active role in addressing environmental problems.
- Help the individuals to understand, analyse and evaluate the relationship between themselves and their surrounding.
- Help the understanding of the ecological processes that govern life on earth.
- Help understand the social and cultural influences that determine human values, perceptions and behaviour towards the environment.
- Builds an awareness of the individual's own personal relationship with the environment as a consumer, producer and salient member of a community.

(Le Roux, 2002: 24)

2.6 CONCLUSION

In conclusion, Environmental Education and environmental awareness are of great advantage because they increase environmental consciousness, can be used to co-ordinate environmental activities, promote environmental ethic and can be used to empower the society to act on environmental issues. They also help in acquiring skills, values and commitment that are needed to achieve sustainable development. This chapter looked at the relationship between Environmental Education and awareness. It gave the definitions of the two concepts and how Environmental Education helps in raising environmental awareness. Environmental awareness can successfully lead to sustainable use of resources and sustainable development.

CHAPTER 3

ENVIRONMENTAL AWARENESS AND SUSTAINABLE DEVELOPMENT

3.1 INTRODUCTION

The purpose of this chapter is to provide an overview of sustainable development and environmental awareness and the role that Environmental Education can play in achieving the principles of sustainable development. South Africa faces a number of environmental problems that needs young minds that are environmentally aware of such issues. This will enable them to come up with relevant strategies to solve environmental problems. Environmental Education and awareness are relevant educational responses to these environmental problems. In addition, Environmental Education and awareness are critical for promoting sustainable development and improve the capacity of the people to address environmental and development issues (Fien, 1993: 12).

The White Paper on Education and Training (RSA, 1995) advocates for Environmental Education, involving interdisciplinary, integrated and active approach to learning, must be a vital element of all the levels and programmes of education and training, in order to create environmentally literate and active citizens and ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources. On the other hand, the National Environmental Management Act, Act No 107 of 1998 (Department of Environmental Affairs and Tourism, 1998) identified the need for Environmental Education and stated that the community wellbeing and empowerment must be promoted through Environmental Education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means. This confirms that environmental literacy can be used towards achieving

sustainable development and that environmental awareness will enable the learners to contribute towards sustainable development.

3.2 THE CONCEPT SUSTAINABLE DEVELOPMENT

The notion sustainable development was only introduced into the global debate in the 1980's as an expression of the interdependence between economic development, the natural environment and the people. There are various definitions of sustainable development. The following are some of such definitions.

The most widely accepted definition of sustainable development is the Brundtland report's definition that describes it as development that meets the needs of the present, without compromising the ability of future generations to meet their own needs (Southern African Institute of Environmental Assessment, 2003:4).

Sustainable development is development that seeks to establish a path along which development can progress while enhancing the quality of life of people and ensuring the viability of the natural systems on which that development depends (Southern African Institute of Environmental Assessment, 2003:5).

In terms of the Southern African Development Community, sustainable development for the region must:

- Accelerate economic growth with greater equity and self reliance;
- Improve the health, income and living conditions of the poor majority; and
- Ensure equitable and sustainable use of the environment and natural resources for the benefit of present and future generations.

This description of sustainable development is based on the low levels of human development in Southern Africa and therefore the region's goals for sustainable

development centre around equity issues (Southern African Institute of Environmental Assessment, 2003:6).

Lele (1991:609) points out that sustainable development is development that can continue either indefinitely or for a definite period.

According to Vinke (1992:40) sustainable development is when economic growth occurs at rates that are even faster than population growth, without leading to higher demands for natural resources and increased pressures on the environment. It is the need to live within ecological limits without avoiding the idea of progress.

Blowers (1992:133) says that sustainable development means to promote the enhancement of the natural and built environment in ways that are compatible with the requirement to conserve natural resources and with the need to achieve greater social equality without imposing added costs or risks on future generations.

Mokotso (Undated) defines sustainable development as the use of the environment and resources in order not to threaten the environment and the well being of the people locally and globally or destroys the capacities of future generation to satisfy their reasonable needs.

Fien (1993:7) defines sustainable development as a move from a situation of wasteful consumption and pollution to one of conservation, and from one privilege and protectionism to one of fair and equitable chances open to all.

According to the White Paper for Environmental Management Policy (RSA, 1995: 15) sustainable development is development that does not use up resources more quickly than they are replaced by natural processes or new technology. It

combines concern for the environment with social and economic issues to make sure that human health and natural as well as cultural resources are not harmed.

It is quite relevant that for sustainable development to be achieved, people's understanding, skills and capacity should be developed as far as the environment is concerned. This will enable people especially as young as the learners in this study to participate in achieving sustainable development and sustainable use of the resources. Sustainable resource use is a process of ensuring that the use of non-renewable resources is wise and recognise that all resources' exploitation has an impact on the environment (Zoller, 1997:18).

Sustainable development has three conceptual pillars namely economic sustainability, social sustainability and environmental sustainability. It is about the balance between economic prosperity, social responsibility and environmental protection. It is an increase in human welfare within the resource limits of supporting ecosystems. Environmental Education and awareness will help to move from unrestrained and environmentally insensitive development to sustainable development. The ultimate goal of this will be environmentally sustainable economy that is in balance with ecological processes. Education for sustainable development or sustainability will help the learners to understand the inter-dependence of life on earth (Harboy *et al.* 2001: 33).

To achieve sustainable development the following should be considered:

- Environmental Education must be taught to the learners.
- Environment and development concepts must be incorporated into all educational programmes with analysis of causes, effects and solutions.
- Involve the learners in the local and regional studies on environment, health, including safe drinking water, sanitation and food (Fien, 1993: 14).

Sustainable development advocates for development that takes into account conservation and the better utilisation of the earth's natural resources. These include ecological processes, life supporting systems and genetic diversity. The aspects of sustainable development can be comprehensively captured in Environmental Education. These aspects are the following:

- Ecosystems and biodiversity.
- Economic benefits such as reduced poverty and increased usable goods and services.
- Social systems that include cultural diversity, education and social justice and participation (Palmer, 1998: 93).

The need for sustainable development in South Africa is evident in the Constitution of the Republic of South Africa of 1996 (RSA, 1996:28) which stresses the importance of conservation and recognises the right to an environment that is not harmful to the health and well being of individuals. It further includes the right to have a protected environment, for the benefit of the present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation. It also states the need to promote conservation and secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.

Sustainable development entails the principle of futurity, equity, democracy and participation. Environmental Education and awareness will provide the learners with sufficient information and knowledge to deal with environmental problems that are been encountered locally and globally. They are recognised as key programmes for sustainable development.

For this purpose of the study Brundtland report's definition, as referred on page 28, will be adopted.

3.2.1 PRINCIPLES OF SUSTAINABLE DEVELOPMENT

Principles of sustainable development can guide the management of resources and protect the integrity of ecosystems. The following are the principles of sustainable development that can be included in Environmental Education:

- **Futurity** (a concern for the welfare of future generations).
- **Equity** (the fair sharing of economic benefits and burdens within and between generations).
- **Global environmentalism** (a recognition of the global dimension of ecological problems associated with the use or depletion of natural resources by one or some at the cost of the other).
- **Biodiversity** (the maintenance of integrity of ecological processes and systems).
- **The recognition of the strong interdependence between economic activity and the natural environment.**
- **Individuals and communities have the right and duty to influence the way in which natural resources are utilised, developed and managed.**
- **Promote awareness and understanding of environmental issues by educational process within and outside the formal education system.**

(Basiago; 1995:118)

It should be noted that sustainable development is a philosophy in which principles of futurity, equity, global environmentalism and biodiversity need to guide the management and maintenance of resources in the environment and assist in the provision of resources for the present and future generations. Of great importance, the principles of sustainable development include public

participation in matters affecting the environment and to develop an ethical awareness and commitment towards the sustainable use of resources.

3.2.2 GOALS OF SUSTAINABLE DEVELOPMENT

There are several goals of sustainable development. According to Blowers (1992:133) they include conservation, balanced development, environmental quality, political participation and social equality.

Lele (1991:611) maintains that sustainable development needs to respond to the following goals:

- Integration of conservation and development;
- Satisfaction of basic human needs;
- Achievement of equity and social justice;
- Provision of social self-determination and cultural diversity; and
- Maintenance of ecological integrity.

Pearce (1988:599) outlines the following as the goals of sustainable development:

- Justice in respect of the socially disadvantaged;
- Justice for the future;
- Justice for nature;
- Aversion to risk from ignorance about the nature of the interactions between environment, economy and society; and
- Deal with risk that may arise from the social and economic damage as a result of low margins of resilience to external shock.

In summary, the most important goal of sustainable development should be to pass on to future generations an environment, which is as productive as the one

that the present generation has inherited. The goals of sustainable development must include justice to nature, balanced economic development, satisfaction of basic human needs, maintenance of environmental quality and public participation in issues affecting the environment.

3.2.3 OBJECTIVES OF SUSTAINABLE DEVELOPMENT

The objectives of sustainable development are based on the principles and goals of Environmental Education. Basiago (1995:111) is of the opinion that the basic objectives of sustainable development are to bring economic growth and live in harmony with the environment. The following are the objectives of sustainable development as outlined by Lele (1991:611):

- Basic human needs (jobs, food, energy, water, sanitation and social welfare);
- Revive economic growth;
- Change the quality of life;
- Ensure a sustainable level of population;
- Conserve and enhance the natural resource base;
- Reorient technology and manage risk;
- Merge environment and economics in decision making; and
- Make development participatory.

It may be stated that sustainable development can achieve conservation of natural resources, maintaining a sustainable level of population and public participation in decision-making on matters affecting the environment and economic development. The goals, objective and principles of sustainable development are critical for a balanced development. The aspects of sustainable development such as economic, environmental (ecological), social, technological, justice, moral and cultural can be learned through Environmental

Education. Hence the fact that sustainable development can be well achieved with an effective implementation of Environmental Education (Johnson, 1993:5).

3.2.4 QUALITIES OF SUSTAINABLE DEVELOPMENT

The following are some of the qualities of sustainable development that will be evident results of Environmental Education and awareness:

- Discourages careless disposal of hazardous waste.
- Emphasises living within carrying capacity of the biosphere.
- Seeks better understanding of human needs and re-orientation of social and economic behaviour of the world's riches.
- Discourages the use of the substances that may deplete the ozone layer, leaded petrol and weapons of mass destruction.
- Discourages destruction of the forests.
- Continuously searches for the balance between population growth and resource utilization as well as poverty.

(Palmer, 1998:96)

3.2.5 STRATEGIES FOR SUSTAINABLE DEVELOPMENT

Learners should be taught of the ways in which sustainable development can be achieved. On the other hand, they should be encouraged to actively participate in making sure that the principles of sustainable development are realised. Some of the strategies for attaining sustainable development include:

- Improvement in the compensation of wildlife threat on crops.
- Increased use of renewable energy sources like biogas, solar energy and minimal use of non-renewable resources.
- Reduction of the pollution of scarce water resources.

- Promotion of more environmentally friendly activities such as recycling.
- Encourage active participation of the learners in all environmental conservation programmes.
- Provision of education as a key to sustainable development.

(Ormat, 1991:22)

3.3 SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL LITERACY

The United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil in 1992 was an important milestone for education and in particular Environmental Education. One of the significant outcomes of the Rio conference was to redirect Environmental Education towards sustainable development. Chapter 36 of Agenda 21 for Sustainable Development states that there is a need to increase people's sensitivity to, and involvement in finding solutions for environmental problems. Furthermore, education can give the people environmental and ethical awareness, values and attitudes, skills and behaviour for sustainable development. Education needs to encompass the physical and biological environment, socio-economic environment and human development. Therefore Environmental Education is essential for promoting sustainable development (RDP, 1994:23).

Environmental literacy refers to the basic level of understanding an individual should possess to make intelligent decisions about managing the environment. According to Roth (1992:7) environmental literacy is essentially the capacity to perceive and interpret the relative health of the environmental systems and take appropriate action to maintain, restore or improve the health of those systems. It involves the possession of basic skills, feelings and understanding for the man-environment relationship.

Disinger and Roth (1992:165) are of the contention that the creation of an environmentally literate society is an important aim of Environmental Education. In addition, it is a prerequisite to maintain and improve the quality of the environment. Environmental literacy is the development of an ecological conscience, a responsible commitment, attitudes, values, skills and knowledge that are essential in solving environmental problems for the survival of ecosystems. It is therefore in accordance with the objectives of Environmental Education namely, awareness, knowledge, attitudes, skills and participation.

Therefore, the learners must develop awareness and be sensitive towards their environment. Learners who are environmentally literate should be able to make informed judgements about the environment. These learners should develop knowledge and understanding of:

- The natural processes that occur in the environment.
- Impact of human activities on the environment.
- Different environments both past and present.
- Information about environmental issues, assess and evaluate such information.
- Impact of environmental problems on the quality of life.
- Recognise environmental issues such as greenhouse effect, acid rain, pollution, etc and how to find solutions in context and in collaboration with many parties involved in a particular environmental issue
- Causes, complexity and interrelatedness of environmental issues from a number of perspectives and in various contexts.
- Legislations that control and manage the environment and how policies about the environment are made.
- Environmental inter-dependence of individuals, groups, communities and nations.
- How human lives and livelihood are dependent on the environment.

- The conflicts that can arise about environmental issues and how to solve them.
- How the environment has been affected by past decisions and actions and learns how to avoid negative effects of such decisions and actions in future.
- The importance and benefits of planning, design and aesthetic considerations.
- The importance and need of effective action to protect and manage the environment.
- Learners should be able to understand their role in safeguarding the environment for the future.
- Learners should be able to appreciate and care for the environment.
- Understand how the environment functions, how people interact with it and how environmental issues and problems arise and how they can be solved.
- Learners should be able to live in harmony with the environment.
- The natural resources upon which he is directly or indirectly dependent and understanding of finite and renewable resources.
- Commitment to caring for the environment and its resources.
- Recognising environmental problems when arises and be in a position to come up with relevant solutions.
- Take action to correct environmental imbalances.
- Communicate and applies ecological concepts and principles
- How man's activities influence the environment from an ecological perspective (Le Roux, 2002:51).

Roth (1992:2) states that environmental literacy may shape individuals' behaviour patterns towards the environment. It will enable the change in the present trends that are caused by the choice of personal life styles, which has resulted in the deterioration of the quality of the environment, and a threat to continued existence of life. Environmentally literate learners will have critical awareness of social, economic and political forces of the society. They will also

possess the basic skills and understanding for the man-environment relationship and sound knowledge about the environment (Clachery; 1992:26).

The Southern African Development Community (Southern African Institute of Environmental Assessment, 2003:6) identified the following threats to sustainable development in the Region, which can be successfully dealt with by an environmentally literate society:

- Poverty, high population growth rates and unemployment.
- High infection rates of HIV/AIDS.
- Inadequate capacity to implement policy and monitor the consequences of policy, programme and project implementation.
- Poor governance.
- Degradation of natural habitat and loss of biodiversity.
- Severe degradation of cropland and permanent pasture.
- Deterioration of marine and coastal environments.
- Variability of water availability and deteriorating groundwater quality.
- Inadequate services and opportunities to cope with the high rate of urbanisation.

In summary, environmentally literate learners are aware of the environment and its resources, has an understanding of renewable resources, has feelings of the inter-relationship in nature, is sensitive towards environmental problems, has positive attitudes and values towards the environment, is committed to caring for the environment and takes a meaningful role in solving environmental problems. In conclusion, the achievement of sustainable development is rooted in environmental literacy through Environmental Education, with its philosophy that the quality of life and the quality of the environment are directly related and that each citizen is responsible for maintaining the quality of the environment.

The development and the fostering of environmental literacy need to be a key objective of any general education program because it is of crucial importance for

the learners to be able to take sound decisions to improve the quality of life and the environment in future (Roth, 1992:2). Sustainable development is dependent upon the degree of environmentally literate society which has an awareness of the effect of individual actions towards the environment, basic understanding of the biosphere, knowledge of ecosystem concepts, and knowledge of environmental changes, knowledge of cultural, social, political, ethical, economic and legal context involved in actions that will lead to environmental protection. Environmental literacy is a valuable resource for sustainable development, which is geared towards desirable change for human kind to attain economic and ecological balance.

3.4 EDUCATION FOR SUSTAINABILITY

One of the aims of Environmental Education is to ensure that sustainable development is achieved. This is reflected in education for sustainability. According to Le Roux (2002: 66) there are a number of characteristics of education for sustainability which include:

- Enable the learners to understand the inter-dependence of all life on earth; the results of their actions and decisions may have on the present and future resources on the total environment.
- Increase the learner's awareness of the economic, political, social, cultural, technological and environmental forces, which nurture or hinder sustainable development.
- Develop the learners' awareness, competence, attitudes and values. This will enable them to be effectively involved in sustainable development locally and internationally
- Enable the learners to be in position to integrate environmental and economic decision-making.

Tilbury (1995:209) outlines the components of education for sustainability as based on the principles of sustainable development as follows:

- Relevance;
- Holistic;
- Values education;
- Issue based approach
- Participation; and
- Critical education.

A classic example of education for sustainability is the new education system of South Africa, called Curriculum 2005. Its Outcome Based Education demands that the learner should be able to demonstrate responsibility towards the environment. It provides for the development and use of skills such as problem solving, conflict resolution, information management, interpersonal expression, critical and creative thinking. These skills, effectively utilised, can be a viable tool for education for sustainability. Outcome Based Education enables the learners to demonstrate their ability to use science and technology effectively and critically and to show responsibility towards the environment and the health of others (Department of Education, 1997; Environmental Education Curriculum Initiative, 1996).

The curriculum attempted to put emphasis on environmental concerns across the learning areas. Environment is one of the phase organisers in General Education and Training. Some of the specific outcomes of Curriculum 2005 in the senior phase are geared at improving the level of environmental literacy and contributes towards sustainable development. The following are some of the learning areas that can help in such:

LEARNING AREA	SPECIFIC OUTCOME
1. Human and Social Sciences	<ol style="list-style-type: none"> 1. Make sound judgements about development, management and utilisation of resources. 2. Demonstrate an understanding of interrelationships between society and the natural environment. 3. Address social and environmental issues in order to promote development and social justice. 4. Critically understand the role of technology in social development.
2. Technology	<ol style="list-style-type: none"> 1. Understand and apply the technological process to solve problems and satisfy needs and wants.
3. Natural Sciences	<ol style="list-style-type: none"> 1. Demonstrate an understanding of how scientific knowledge and skills contribute to the management, development and utilisation of natural and other resources.
3. Economic and Management Sciences	<ol style="list-style-type: none"> 1. Demonstrate personal role in economic development. 2. Demonstrate actions that advance sustained economic

	<p>growth, reconstruction and development.</p> <p>3. Evaluate the interrelationships between economic growth and other environments.</p>
4. Life Orientation	<p>1. Demonstrate the values and attitudes necessary for a healthy and a balanced lifestyle.</p>

(Department of Education, 1997)

Education for sustainability will ensure that the key environmental goals identified by Environment and Land Management Sector of the Southern African Development Community are achieved. These goals are as follows:

- Securing sustainable water supply and quality.
- Preventing and reversing desertification.
- Combating coastal erosion and pollution.
- Ensuring sustainable industrial development.
- Making efficient use of energy resources.
- Maintaining forests and wildlife resources.
- Managing demographic change and pressures. (SAIEA, 2003: 48)

Integrating environmental concerns into the specific outcomes of the learning areas will improve education for sustainability in South Africa. Education for sustainability is a critical part of a lifelong learning process. It is also noted that environmental literacy is essential in achieving sustainability across the learning areas of different phases. It can be argued that sustainable development may not be achieved without the essential elements of environmental literacy namely awareness, knowledge, attitudes, skills and determination to act. Environmental

literacy is of central importance to improve the quality of life and the environment and achieving education for sustainability (RDP, 1994: 27).

Many aspects of Environmental Education and environmental literacy contribute to education for sustainability. Environmental literacy is needed to ensure that the learners develop awareness, knowledge, understanding, skills, attitudes, ethic and commitment to allow them to guide their own behaviour towards the environment in a responsible manner required by the principles of sustainable development. In addition, Environmental Education is regarded as the cornerstone for education for sustainability (RSA, 1996:30).

In conclusion, Environmental Education incorporates the principles of sustainable development. It is an effective tool to implement sustainable development, which is understood as improving the standard of living of the people without incurring uncompensated costs to future generations. For sustainable development to be effective, there must be an appropriate Environmental Education programme in place that will provide the learners with skills necessary for the use and management of natural resources. Environmental literacy will help the use of the resources sustainably. Through education for sustainability, better lifestyles can be achieved, natural resources be protected and the quality of life be maintained for now and for future generations. Finally, a sustainable society is dependent on having a generation of environmentally literate and responsible citizens.

3.5 CONCLUSION

This chapter discussed the relationship between sustainable development and environmental awareness by detailing a close link with environmental literacy and explaining education for sustainability. It is crystal clear that environmental awareness and Environmental Education are keys to sustainable development, which encapsulate the concept of development that enhances the quality of human life without compromising the viability of natural systems.

In chapter 4, an attempt is made to detail the empirical research and the final aspect which is the findings of empirical research.

CHAPTER 4

EMPIRICAL RESEARCH

4.1 INTRODUCTION

The information in the previous chapter of this study led to the conclusion that an empirical investigation is needed. This investigation is of crucial importance because it discusses the opinions, attitudes and understanding of the learners towards the environment and assessing their level of environmental awareness. The logical aim of this chapter is to understand the level of environmental awareness of the learners and finally come up with the relevant recommendations. This chapter looks at the instrument used to gather information on environmental awareness of the learners, method of research, research design, target group and area of sampling. The results of the empirical research are outlined, discussed and interpreted.

4.2 METHOD OF RESEARCH

The research method is discussed below and has taken the following into consideration:

- the purposes of the research;
- the research design;
- the instrument used to gather information;
- the study population;
- the sample area;
- the processing of data; and
- statistical techniques and data analysis

4.2.1 THE PURPOSE OF THE EMPIRICAL RESEARCH

Environmental Education and awareness can be successfully used to achieve sustainable development. The purpose of the empirical research will include the following:

1. To assess the level of environmental awareness of the learners.
2. To assess the attitudes of the learners towards the environment.
3. To assess the learners' understanding of environmental problems and sustainable development.

4.2.2 RESEARCH DESIGN FOR THE STUDY

In order to acquire relevant information about environmental awareness of the learners, qualitative research was conducted to obtain the opinions to the learners. Quantitative research was also conducted with regard to the number of the learners used. This section focuses on the selection of the instrument to gather data, selection of respondents, the sample area, how learners were chosen and the questions about environmental awareness they had to respond to.

4.2.3 SELECTION OF A MEASURING INSTRUMENT

There are several measuring instruments that the researcher could use to assess environmental awareness of the learners such as questionnaires, interviews and observations. However, the use of a questionnaire was selected because of its convenience since the learners were from different schools and grades.

4.2.3.1 WHAT IS A QUESTIONNAIRE?

A questionnaire is a scientific instrument for the measurement and/ or collection of particular kinds of data. It is not just a list of questions or a form to be filled out.

Questionnaires can be used for surveys and opinion polls. It is used to collect descriptive, quantitative data (Berdie & Anderson, 1974: 67)

There are two types of questions namely, the open-ended and close-ended questions in a questionnaire. In open-ended questions, respondents are free to answer in their own words, to reveal their thoughts and can give reasons for their responses. However, these questions are often difficult to score, interpret, analyse, tabulate and summarise in the final report. In addition, open-ended questions take a lot of time for respondents to write answers for they may be thought provoking.

On the other hand, closed-ended questions are worded in such a way that they are short, precise can be given from a list of alternatives. They are also easy, less time consuming and convenient to fill in. They are objective and acceptable. For the researcher, closed-ended questions are legible, easy to tabulate, analyse and less open to misinterpretation. They enable the respondents to answer the questions within a certain period of time and the same frame of reference is used for all the respondents. However, close-ended questions can make the respondents to guess based on the alternatives given and not give their own response. Again too many alternatives may be confusing to the respondents.

Closed-ended questions are generally more acceptable for respondents than open-ended ones. This is as a result of the fact that they can be answered by a tick or a cross and therefore coding and statistical analysis is not time consuming and is done with less effort.

For the purposes of this study both open-ended and closed-ended questions were used. This enabled the respondents to give balanced answers based on the alternatives provided and been given an opportunity to express their personal views in open-ended questions.

4.2.3.2 ADVANTAGES OF THE QUESTIONNAIRE

The following are important factors associated with a questionnaire:

- A questionnaire can be completed under supervision or independently.
- It can be used to gather information from a variety of respondents.
- It can reach a large group of people.
- It does not place any pressure on respondents because it can be completed at their own time. (Mouly, 1978:188)
- A questionnaire does not allow too much deviation in responses because it has instructions and its uniformity. Therefore data is comparable.
- It is easy to plan, compile and administer.
- It is a cost effective way to gather information because it saves time, inputs and costs.
- A questionnaire is impersonal. Respondents can give honest opinions and be frank especially if they are anonymous. Thus it can be reliable. (Berdie & Anderson, 1974:70).

4.2.3.3 DISADVANTAGES OF A QUESTIONNAIRE

The following are the limitations that can be posed by a questionnaire:

- Low response rate.
- Lack of personal contact.
- Questionnaires that are not returned increase the possibility of biased sampling.
- Those who respond are possibly more responsible people and may also be in favour of the research.
- Some respondents regard questionnaires as unimportant and answer the questionnaires haphazardly and without enthusiasm and seriousness.
- Questionnaire about attitudes are difficult to compile (Mouly, 1978:189)

- It is sometimes difficult to control its reliability and validity.
- The same question may have different meanings to different people.
- Many respondents do not want to write controversial issues, especially open-ended questions.
- Respondents fail to answer open-ended questions.
- It cannot be used for illiterate people.
- Motivation of the respondent is difficult to check.
- Long questionnaires may discourage respondents.
- Respondents can be influenced by the alternatives provided by the researcher (Berdie & Anderson, 1974:76).

In summary, the use of questionnaires is based on the assumption that respondents will provide truthful answers. They are used to obtain information on awareness, knowledge, attitudes, values, judgement and behaviour, which are important in environmental awareness and education. The success of the questionnaire will rely on openness, honesty and frankness of the respondents. The questions in the questionnaire are discussed in paragraph 4.5.

4.3 THE STUDY POPULATION

The empirical research was conducted in 15 schools in Mabopane District that were within the proximity of the researcher. Three hundred learners doing Grades 9 and 11 were identified and selected for the purposes of evaluation. This was done through the help of an educator at each school whom the school principal allocated to help the researcher. Learners were then chosen randomly by the educators in both Grades 9 and 11. Learners were taken from a variety of learning areas.

This is done in order to assess the general environmental awareness of the learners across learning areas, to compare those who are doing Grade 9, which is an exit level to Further Education and Training level to Grade 11 learners who

are already at the Further Education and Training level. To encourage openness, accuracy and a better return of the questionnaires, anonymity was guaranteed. The names of the schools and of the learners were not disclosed. The schools where the learners participated in the empirical research were numbered numerically.

4.4 THE SAMPLE AREA

Mabopane District is made up of schools in the rural and urban residential areas of Mabopane, Winterveldt, Klipgat, Hebron, Kgabalatsane, Shakung, Rabokala, Madidi and Makaunyane, North of Pretoria. All the schools fell under the Bophuthatswana Homeland, where its University, UNIBO, now North-West University, Mafikeng Campus was one of the first tertiary institutions to offer Environmental Education to student teachers. The District now falls under North-West Department of Education.

The researcher identified 15 schools, which were in convenient proximity, where the questionnaires were distributed. Twenty questionnaires were distributed per school. The researcher wrote to the APO Manager formerly known as District Managers (Refer to Appendix 1) to request a written permission to conduct the empirical research in the identified schools. Permission was granted subsequently (Refer to Appendix 2). The researcher contacted the school principals telephonically or in some instances where the telephone number was not available went to the school to make arrangement for conducting the research. The principals then allocated one educator to the researcher who helped in selecting the learners in both Grades 9 and 11 in various learning areas to participate in the empirical research. The learners were gathered in one classroom to fill out the questionnaire.

The researcher and the educator then distributed the questionnaires to the learners. To avoid some degree of intimidation the researcher occasionally

stepped outside the classroom while the learners were filling out the questionnaires. It must be noted that 20 learners were spread in a big classroom, apart from each other so as they should not refer into each other's work. At the same time the researcher went from time to time back into the classroom to check them. When the learners had completed to fill out the questionnaire, they were requested to put them on the table in front. The schools were given numbers as their names for anonymity purposes.

4.5 QUESTIONS

The questionnaire for this study (Refer to Appendix 3) consists of five sections namely A, B, C, D and E. Section A is the personal details of the learner, which provided information on the learner's Grade and Learning Areas. This information is used to compare the level of environmental awareness between learners in Grades 9 and 11 as well as those doing different learning areas. Section B is about the learner's relationship to the environment. This information is used to assess the learner's attitude to the environment. Section C is about the learner's knowledge about the environment and its problems. The information here will help to assess the learner's awareness with regard to environmental problems.

Section E consists of open-ended questions in which the learners can express their views and opinions. This section also seeks to assess their knowledge of environmental problems and what role they can play in providing solutions to environmental problems. The section is strategically placed in the middle of the questionnaire because if it was at the end the learners may be tempted not to complete it. The last section, which is Section D, is about sustainable development and Environmental Education. This will inform the researcher if the learner understands what Environmental Education is and its relationship to sustainable development and how sustainable development can be achieved through Environmental Education.

The researcher and the educator issued each learner with a copy of a questionnaire. She requested the learners to read the questionnaire carefully before responding to it and was encouraged to answer all the questions for consistency purposes. Questionnaires were collected immediately after the respondents were finished. The presence of the researcher was to render assistance wherever it was necessary, without influencing the response of the learners and to collect the questionnaires as soon as the respondents were finished. These questions were used to facilitate the completion of the research project.

4.6 STATISTICAL TECHNIQUES USED TO PROCESS DATA

The Statistical Consultation Service of the North- West University (Potchefstroom Campus) was used to enter and process data obtained from the questionnaires. Data that was collected through the use of the questionnaires will be analysed and interpreted in this section. The process of analysis and interpretation of data will be based on the respond of learners from both Grades to assess the environmental awareness of the learners.

The SAS System for Windows Release 9.1 was used to process data. The methodology used to analyse data is through practical significant differences (Effect-sizes). According to Ellis and Steyn (2003) statistical significance is not relevant for convenience sampling methods. Practical significance can be understood as a large enough difference to have an effect in practice. A natural way to comment on practical significance is to use the standardised difference between the means of two populations, i.e. the difference between the two means divided by the estimate for standard deviation. Effect sizes are described for differences in means and for the relationship in two-way frequency tables.

4.7 RESULTS AND DISCUSSION REGARDING THE EMPIRICAL RESEARCH

The frequencies of the total group that is both Grades 9 and 11 were used. This indicated the response of the learners with regard to sections A, B, C and D.

4.7.1 SECTION A: BIOGRAPHICAL INFORMATION OF THE LEARNERS

Table 4.1 presents the total number of the learners who participated.

GRADE	NUMBER	PERCENTAGE
Grade 9	95	38
Grade 11	152	62
Total	247	100

TABLE 4.1: NUMBER OF THE LEARNERS IN GRADE 9 AND 11

The number of the grade 9 learners is less than that of grade 11 learners because there are more High Schools than the Middle Schools in Mabopane District and in close proximity to the researcher.

4.7.2 SECTION B: THE LEARNERS' ATTITUDE TOWARDS THE ENVIRONMENT.

The following table shows the responses of the learners in Section B.

QUESTION NUMBER	% ANSWER IS YES	%ANSWER IS NO
B1: Know of the environmental problems	85%	15%
B2: Care for the environment	93%	7%
B3: Involvement in environmental projects	22%	78%
B4: Value the environment	86%	14%
B5: Importance of nature and the environment	95%	5%
B6: Nature have personal meaning	87%	13%

TABLE 4.2: RESPONSE TO SECTION B (ALL THE LEARNERS)

Responses in Section B show that the attitude of the learners towards the environment is positive. The fact that 78 % of the learners indicated that they are not involved in any environmental conservation projects could be due to the fact that there may be no environmental organisations which the learners can belong to or they are reluctant to belong to any or lack of exposure to such organisations. The results show that the learners from both Grades 9 and 11 care about the environment and it are important to them.

4.7.3 SECTION C: THE LEARNERS' KNOWLEDGE WITH REGARD TO THE ENVIRONMENT AND ITS PROBLEM.

The following table shows the percentage of the learners who gave correct answers to the various questions in Section C of the questionnaire.

QUESTION NUMBER	% FOR CORRECT RESPONSES
C1: Disposal of hazardous waste	21%
C2: Best environmental options	20%
C3: Cutting of trees	28%
C4: Poor methods of agriculture	33%
C5: Atmospheric pollution	38%
C6: Sustainable use of natural resources	18%

TABLE 4.3: PERCENTAGE OF THE LEARNERS WHO GAVE CORRECT RESPONSES

The learners who gave correct responses are less than 50% in each question. This indicates that the learners are not aware of the possible environmental problems in their vicinity. Logically, if one does not know the problem, one cannot know the cause and attempt to bring a solution. Therefore, the contribution of the learners in reducing existing environmental problems and coming up with solutions is questionable.

The following is the comparison of the incorrect and the correct responses of the learners in Section C:

- 41.28% of the learners say that hazardous waste should be buried in a deep hole in the ground for disposal and 21.28% says it should be disposed of at a specially designed site.
- 44, 35% is of the opinion that the best environmental option is to recycle, reuse, reduce while 20% states that it is reduce, reuse, and recycle.
- 55, 79% says that cutting of trees can lead to the reduction of oxygen in the atmosphere while only 28.33% says that it can lead to the accumulation of carbon dioxide in the atmosphere.
- 41, 25% argue that poor methods of agriculture will cause pollution and 33, 33% is of the opinion that they will lead to erosion.
- 50, 83% of the learners maintain that atmospheric pollution leads to cloud formation while 38, 43% points out that it will lead to acid rain.
- 35, 14% of the learners argue that sustainable use of natural resources means utilising them while 18, 47% says is avoiding their depletion.

The above discussion indicates that the level of awareness with regard to environmental problems is low. The response indicates that these learners are not well conversant with hazardous waste disposal, best environmental options, problems associated with poor methods of agriculture, atmospheric pollution and sustainable use of resources.

4.7.4 SECTION D: THE LEARNERS' UNDERSTANDING OF THE RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT AND ENVIRONMENT EDUCATION

The following table shows the percentage of the learners who gave correct responses:

QUESTION NUMBER	% FOR CORRECT RESPONSE
D1:Environmental Education as a separate subject	51%
D2: Nature and ecosystem	88%
D3:Environmental Education and sustainable development	68%
D4:Environmental Education and sustainable development	75%
D5: Preserve and conserve nature	48%
D6: Maximum use of natural resources	77%
D7: Reuse and recycling of resources	52%
D8: Youth and environmental issues	70%
D9: Trees and development	69%
D10:Social, economic and physical environment	79%

TABLE 4.4: LEARNERS WHO GAVE THE CORRECT RESPONSES IN SECTION D

In this section the learners clearly are aware of the close relationship between sustainable development and Environmental Education. The only poor response is where 48, 37% of the learners indicated that preserving and conserving nature is of advantage to sustainable development, which is an insignificant difference.

4.7.5 SECTION E: OPEN-ENDED QUESTIONS.

In this section, the learners could give their own opinions regarding environmental awareness. However, this is the section in which the learners' responses were very poor as in some of the questionnaires this section was not filled out and some of the learners gave answers such as "I do not know". The researcher therefore concluded that the learners are not aware of the environmental problems that can be brought by population growth. The majority of the learners were unable to provide the definitions of sustainable development and Environmental Education.

The learners could not see themselves participating in protecting the environment. This matches with the response in Section B in which 78% of the learners indicated that they are not involved in any environmental conservation projects.

4.7.6 RELIABILITY

Alpha Chronbach Coefficient was calculated to determine the reliability of the different sections of the questionnaire. Interrelated items are summed to obtain an overall score for each participant. Chronbach's Coefficient Alpha estimates the reliability of this type of scale by determining the internal consistency of the test or the average correlation of items within the test. For a Chronbach Coefficient Alpha greater than 0.5, the measuring instrument is said to be

SECTIONS	CHRONBACH'S COEFFICIENT ALPHA
B	0,63
D	0,54

TABLE 4.5: CHRONBACH'S COEFFICIENT ALPHA

These results show that sections B and D are reliable measuring instruments as compared to section C. In Section C single questions were asked and therefore the Chronbach's Coefficient Alpha is not applicable.

4.7.7 COMPARISON BETWEEN GRADE 9 AND 11

To compare the environmental awareness between the learners in Grades 9 and 11 effect sizes were calculated (Ellis & Steyn, 2003).

GRADE 9		GRADE 11	
SECTIONS	SCORE	SECTIONS	SCORE
B	42,22	B	57,7
C	40,76	C	59,29
D	41,15	D	58,85
E	18	E	24

TABLE 4.6: THE TOTAL SCORING FOR EACH SECTION PER GRADE

It is concluded that in general the level of environmental awareness of Grade 11 learners is higher than that of the Grade 9 learners because the Grade 11 learners gave more correct answers than the Grade 9 learners. This may be

attributed to the fact that the level of understanding of the Grade 11 learners is generally higher than that of the Grade 9 learners.

Means and deviations were calculated for Sections B, C and D for both Grades 9 and 11.

GRADE 9			GRADE 11		
SECTIONS	MEAN	STANDARD DEVIATION	MEAN	STANDARD DEVIATION	EFFECTS SIZE (d)
B	73,6	26,5	79,2	14,2	0,22
C	55,3	18,1	59,2	11,9	0,10
D	64,9	22,6	69,0	19,5	0,18

TABLE 4.7: MEANS AND STANDARD DEVIATIONS

Although there is an increase in environmental awareness from Grade 9 to 11 (See Tables 4.6 and 4.7), the difference is not practically significant.

4.8 CONCLUSIONS REGARDING THE EMPIRICAL RESEARCH

The following paragraphs outline the final results, and conclusions on the empirical research.

Analysis was carried out based on the attitudes of the learners towards the environment, the relationship between sustainable development and Environmental Education and the learner's knowledge on environmental problems. The reliability of the questionnaire was measured by calculating Chronbach's Coefficient Alpha. The following results were reached:

- In general, the level of awareness between the learners in Grades 9 and 11 do not differ significantly.

- There is no significant difference between Grade 9 and 11 for their attitudes towards the environment, understanding of the relationship between sustainable development and Environmental Education and the learner's knowledge of environmental problems.
- Level of environmental awareness of the learners in Grade 11 is higher than that of the learners in Grade 9.
- There is a lack of knowledge regarding environmental problems.
- The attitude of the learners towards the environment is positive.
- The learners are not actively involved in environmental projects or with environmental organisations
- The learners could not provide the explanations on sustainable development and Environmental Education.

In summary, the empirical research provided the researcher with reliable data to assess the level of environmental awareness of the secondary school learners in Mabopane District, to come up with the findings and recommendations that will be discussed in the following chapter.

CHAPTER 5

SUMMARY, FINAL CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter provides the summary for the study, final recommendations and conclusion. An overview of the previous chapters will be given, which will culminate into the final conclusions.

5.2 SUMMARY

Chapter 1 provided a detailed discussion on the rationale for the study. Reference was made to the constitutional right to a clean and healthy environment. A brief discussion of environmental problems faced by the world population was made and a need for an environmentally literate society to be able to deal with such problems. This chapter also discussed the problem statement, the aims of the research, research methodology that included both a literature review and an empirical research and preliminary chapters.

Chapter 2 looked at the relationship between Environmental Education and environmental awareness. Various definitions of environment, Environmental Education and environmental awareness were given. In depth discussion of the goals, objectives, guiding principles on Environmental Education was detailed. It also looked at environmental awareness with reference to its advantages and disadvantages.

In chapter 3 a relationship between environmental awareness and sustainable development was examined. The concept sustainable development was

discussed, its principles, goals, objectives, qualities and strategies. The link between sustainable development and environmental literacy was discussed to show that an environmentally literate society can be in a good position to achieve sustainable development.

Chapter 4 looked at the empirical research in which the purpose of empirical research, research design, instrument to gather data, study population, sample area, statistical techniques and data analysis were discussed. This chapter also provided the results or findings of the empirical research.

5.3 FINAL CONCLUSIONS

The level of environmental awareness between Grades 9 and 11 does not differ significantly but improves as learners progress to Grade 11. Their attitude towards the environment is positive and therefore need sufficient guidance to understand problems associated with the environment so that they can meaningfully contribute to their solutions. It may be noted that the level of environmental awareness depends on the cultural, social, political and educational context. There is well-documented evidence that human activities lead to environmental problems such as the greenhouse effect, atmospheric pollution and environmental degradation.

Ariasingam (1999) points out that to protect environmental investments, environmental information and knowledge must be available to the people through education, awareness and literacy programmes. The learners need knowledge and skills to investigate and evaluate environmental problems and be able to take informed decisions. They need to develop values, positive attitudes and commitment to keep the environment healthy and use the resources in a sustainable manner for future generations.

Developing environmental literacy among the learners is a major challenge for both the government and educators. The educators need to be well trained and be passionate about the environment and issues around sustainable development.

5.4 RECOMMENDATIONS

The following are the recommendations following from this study. These recommendations are the guidelines that can be used in Environmental Education to achieve sustainable development and environmental awareness programmes for the learners.

5.4.1 GUIDELINES OF HOW SUSTAINABLE DEVELOPMENT CAN BE ACHIEVED THROUGH ENVIRONMENTAL EDUCATION

- Identify and prioritise the need for Environmental Education in schools.
- Draw up an environmental policy that will include objectives and targets to be achieved by different schools. The policy will also be a means of organising environmental activities and learning, all of which form part of a school curriculum.
- Designing and developing relevant environmental programmes for schools that will include media, entertainment and workshops.
- Integrating environmental learning content into existing learning areas.
- Schools need to liaise with external groups such as non-profit organisations dealing with environmental issues to collectively contribute to a healthy environment.
- Train the educators to teach in an environmentally orientated approach.
- Extensive use of case studies is needed because learners often need facts that will make them aware of environmental issues and the detrimental impacts on the environment of certain practices.

- Educators should use teaching techniques that will allow cross sectoral approaches and problem orientated methods, where the learners can better understand environmental and sustainable development issues.
- Integrate the principles of sustainable development in Environmental Education programmes.
- Pre-service and in-service teacher education in Environmental Education so as to improve the level of environmental literacy of the educators.

5.4.2 ENVIRONMENTAL AWARENESS PROGRAMMES

- Celebrate environmental days such as World Environmental day, Arbour day and World Wetlands day to continually conscientise the learners about environmental issues, how they affect them and how they can innovatively solve them.
- Be involved in “green” campaigns such as recycling, anti-pollution campaigns and conservation.
- Sponsorship from companies to hold events such as Environmental Exhibitions where the learners from various schools display artwork. Learners will be asked to identify environmental problems such as waste management, pollution in their respective schools. The learners will then come up with measures to correct or improve the situation.
- Learners are to be enlightened about careers they can follow in environmental management.
- Learners are to be encouraged to watch programmes that deal with environmental issues on television.
- The use of indigenous knowledge within Environmental Education so as to learn from traditional skills to manage complex ecological systems.
- Learners are to be made aware of projects such as eco-tourism so as to better understand the value of our environment.
- Schools in the same district can form partnerships to work together in promoting environmental awareness.

- Educators may be engaged in projects such as eco-labelling of various classes.
- Learners to be involved in environmental projects that will benefit the community such as planting trees and recycling.
- Environmental Education must include the bio-physical environment as well as the socio-cultural environment.
- Learners to have skills in effective participation in environmental activities.
- Learners to be involved in the empowerment of the local communities through Environmental Education.

5.5 FINAL REMARK

The learners need to be equipped to be in a position to take their own moral decisions about environmental matters. They must be able to think positively about the environment as our future depends on the environment and its natural resources. The type of education offered to the learners must enable them to make responsible decisions about the environment. To achieve the aims and objectives of both Environmental Education and sustainable development, environmental education programmes must pervade all the learning areas at all the grades and provide the learners with information that is as concrete and direct as possible.

The study came up with the guidelines on how sustainable development can be achieved through Environmental Education that can be used to ensure that the learners understand that sustainable development is socially, ecologically and economically important for today and future generations. Finally, the study suggested environmental awareness programmes that will help the learners to be actively involved in preventing environmental problems and bring solutions to the existing ones.

On the other hand, educators must be well trained in offering environmental education programmes. The learners must be sensitive to environmental concerns. It is of utmost importance to ensure that our education system jealously develops and nurtures environmental literacy and awareness for sustainability. Environmentally literate learners will ensure that environmental impacts are minimised and effective environmental management is achieved.

AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE.

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APPENDIX 1: PERMISSION LETTER TO THE APO: MABOPANE DISTRICT

P.O. Box 93761
BOORDFONTEIN
0201
04 August 2004

**ATTENTION: APO MANAGER
MABOPANE DISTRICT**

Dear Sir/ Madam

A REQUEST TO CONDUCT A RESEARCH

I am a Masters student in Environmental Management and Analysis at the North-West, Potchefstroom Campus. As part of my studies, I need to submit a mini dissertation. I therefore need to distribute a questionnaire to the learners who are doing Grades 9 and 11. The topic for my research is The Assessment of Environmental Awareness of the Secondary School learners in Mabopane District.

I hereby request a permission to distribute questionnaires to some of the learners. I promise that the process will not interrupt with the normal process at the schools and the information will remain confidential.

Yours sincerely



Komane Florah

Mobile Number: 083 283 5265

Fax Number: (012) 549 6178

APPENDIX 2: A LETTER FROM APO GRANTING PERMISSION



Department of Education



MABOPANE AREA PROJECT OFFICE

P/BAG X 579, MABOPANE, 0190 TEL: 012-7022214-6 FAX 012 7025300 Email: manoloto@ncwpp.org.bo

Enquiries: E. R. Mafoko
Tel : (012) 702 7422
Date : 06 August 2004

To. Ms Komane Florah

SUBJECT: REQUEST TO CONDUCT RESEARCH

Madam

The matter referred above has reference.

Permission is granted to you to conduct research in secondary schools in the APO as requested. This activity should not, however, disrupt the normal functioning of schools.

We furthermore request you to avail a bound copy of your research to the APO on completion of your studies.

We wish you all the best in your studies.

Acting APO Manager



APPENDIX 3: QUESTIONNAIRE FOR THE LEARNERS

**NORTH-WEST UNIVERSITY
(POTCHEFSTROOM CAMPUS)**

**TOPIC: AN ASSESSMENT OF ENVIRONMENTAL AWARENESS
OF SECONDARY SCHOOL LEARNERS IN MABOPANE DISTRICT**

Dear Learner

This research is aiming at assessing environmental awareness of the learners in the Mabopane District. As a tool of gathering information about the level of environmental awareness among the learners, this questionnaire is designed for such a purpose. You are therefore requested to complete the questionnaire attached. The information gathered will only be used for academic or research purposes and you are assured that it will remain confidential.

Thank you for your co-operation

Yours faithfully

Komane Florah (Ms)


.....

Supervisor: Prof. N.J. Vreken

.....

SECTION A: PERSONAL DETAILS

Grade:

Content subjects (Learning Areas):

.....

.....

.....

SECTION B: LEARNER'S RELATIONSHIP TO THE NATURAL ENVIRONMENT

Instruction: Please indicate your response by circling the relevant answer.

1. Do you know of problems in your environment? Yes/ No
2. Do you care about nature? Yes/ No
3. Are you involved in any environmental conservation projects? Yes/ No
4. Do you value the environment? Yes/ No
5. Are the environment and nature important to you? Yes/ No
6. Does nature have a personal meaning to you? Yes/ No

SECTION C: LEARNER'S KNOWLEDGE ABOUT THE ENVIRONMENT AND ITS PROBLEMS/ ISSUES.

Instruction: Please indicate your response by circling the relevant answer.

1. Hazardous waste should be disposed of:
 - a) By burning on site
 - b) By burying it in a deep hole in the ground
 - c) At municipal landfill site
 - d) At a specially designated site
2. The best environmental option is:
 - a) Recycle, reuse, reduce
 - b) Reduce, reuse, recycle
 - c) Reduce, recycle, reuse
 - d) Reduce, recycle, dispose
3. Cutting of trees can lead to :
 - a) Accumulation of carbon dioxide in the atmosphere
 - b) Reduction of oxygen in the atmosphere
 - c) More fresh air in the atmosphere
 - d) More rainfall
4. Poor methods of agriculture can cause:
 - a) Fires
 - b) Erosion
 - c) Drought
 - d) Pollution
5. Atmospheric pollution leads to:
 - a) Acid rain
 - b) Cloud formation
 - c) Rainbow
 - d) Blue sky
6. Sustainable use of natural resources means:
 - a) Exploiting natural resources
 - b) Utilising natural resources
 - c) Avoid the depletion of resources
 - d) Depleting natural resources

SECTION E: GENERAL

1. How can population growth lead to environmental problems?

.....
.....

2. What do you understand by environmental degradation?

.....

-
3. What do you think can be done to improve the state of our environmental conditions?
-
-
4. What does sustainable development mean?
-
-
5. What is environmental education?
-
-
6. What do you think your role can be in protecting our environment?
-
-
7. Name any environmental problems
-
-
-

SECTION D: SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL EDUCATION

USE THE SCALE BELOW TO ANSWER THE FOLLOWING QUESTIONS

1. Agree (A)

2. Disagree (D)

1. Environmental Education is included as a separate learning area in our syllabus.
2. Environmental Education is about nature and ecosystem.
3. There is a link between Environmental Education and sustainable development.
4. Sustainable development must be at the centre of Environmental Education.
5. *Preserving and conserving nature is of advantage to sustainable development.*
6. Natural resources must be used to the maximum and should not care about the next generation.
7. Environmental Education must not stress reuse and recycling of resources.
8. Young people must be of concern regarding environmental issues and sustainable development.
9. All the trees must be cut to make way for roads and housing developments.
10. Development must take into account the social, economic and physical environment.
