TOWARDS THE INCORPORATION OF ENVIRONMENTAL EDUCATION IN THE NAMIBIAN SECONDARY SCHOOL CURRICULUM

by

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Abstract

Environmental education (EE) as an approach to all education is needed to be incorporated in all the subjects of the school curriculum. In Namibia, there are Ministerial documents that support the incorporation of education *About, In/ Through* and *For* the environment within the curriculum. Even though there are documents that support this, EE continues to suffer barriers that hinder its effective incorporation into the curriculum. The findings reveal that EE in Namibia is incorporated into the traditional environmental subject homes only. The barriers that prevent the incorporation of EE into the Namibian broad curriculum for secondary schools are, amongst others, the lack of adequate teacher education programmes and the lack of interdepartmental collaboration at school level. These barriers and many others have been identified and discussed in detail in this investigation. Measures are recommended to ensure effective incorporation of EE in the Namibian broad curriculum for secondary schools.

Key concepts:

Environmental Education, Curriculum Development, Formal Education, Multidisciplinary Approach, Interdisciplinary Approach, Cross-curricular Teaching, Integration, Incorporation.

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List of Abbreviations

BETD-	Basic Education Teacher Diploma
CITES-	Convention for International Trade in Endangered Species
DABE-	Directorate of Adult Basic Education
DANCED-	Danish Cooperation for Environment and Development
DANIDA-	Danish International Development Agency
DRFN-	Desert Research Foundation of Namibia
EE-	Environmental Education
EEPI-	Environmental Education Policy Initiatives
EESA-	Environmental Education Association of Southern Africa
EPA-	Environmental Protection Agency
Et-	Enviroteach
EVE-	Environmental Values Education
FATPP-	Forest Awareness and Tree Planting Project
H/ IGSCE-	Higher/ International General Certificate of Secondary Education
JSP-	Junior Secondary Phase
IUCN-	International Union for Conservation of Nature and Natural Resources
IEEP-	International Environmental Education Programme
INSET-	In-service Teacher Education.
LS-	Life Science
LSMS	Life Science Materials Support
MBEC-	Ministry of Basic Education and Culture
MBESC-	Ministry of Basic Education, Sport and Culture
MEC-	Ministry of Education and Culture
MET-	Ministry of Environment and Tourism
MWCT-	Ministry of Wildlife, Conservation and Tourism
NAEE-	National Association for Environmental Education
NIED-	National Institute for Educational Development
NEEN-	Namibian Environmental Education Network
NHSE-	Natural Science and Health Education
PRESET-	Pre-service Teacher Education

RME-	Religious and Moral Education
SADC-	Southern Africa Development Co-operation
SIDA-	Swedish International Development agency
SPSS-	Special Package for Social Sciences
SRAP-	Sub Regional Action Programme
SWAPO-	South West Africa People's Organisation
UN-	United Nations
UNAM-	University of Namibia
UNESCO-	United Nations Educational, Social and Cultural Organisation
UNEP-	United Nations Environmental Programme
WWF-	Worldwide Fund for Nature
WUS-	World University Service

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Declaration

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I declare that the dissertation **Towards the Incorporation of Environmental Education in the Namibian Secondary School Curriculum** is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Signature
(MR A.T KANYIMBA)

15 January 2002
Date

Dedication

Dedicated to my late mother, **Nalufu Albertina Munsu**, a single parent who made sure that I received an education.

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Chapter 1: Setting the scene

1.1 Introduction and Background

Although concern for the environment manifested itself quite some time ago, serious efforts throughout the world only began about three decades ago. In Namibia this concern was also there a long time back but seriously started in 1990 when the country became independent. This concern grew in Namibia and elsewhere in the world as a result of continuing environmental problems afflicting the world community. Acar in Hale (1993) lists deforestation, desertification, land degradation, disposal of toxic waste and hazardous waste, effects of acid rain, depletion of ozone layer, bush fires, over fishing, over cultivation, soil erosion, population control, dumping of waste in water and poaching as global and local environmental problems facing mankind today. These environmental problems also pose a health hazard to mankind. A fine example of this has been observed in Namibian charcoal workers who were exposed to dust and developed respiratory diseases such as bronchitis and lost their normal voices.

In response to the environmental crises, a number of conferences such as: The Stockholm Conference (1972), The Belgrade Charter (1975), The Tbilisi Declaration (1977), Environmental Education in the Light of the Tbilisi Conference (1977), The Bruntland Report (1987), World Conference on Education for All (1990), the Earth Summit (1992), World Conservation Congress (1996), State of the world Report (1997), Unep Report, Nairobi (1997), Earth Summit +5 (1997) and the International Thessaloniki Conference on Environment & Society: Education and Public Awareness for Sustainability *(1997)* were held. These conferences and international declarations indicated that education and training are important instruments in empowering communities so that they become "agents of social change and sustainable development" (Huckle in Fien, 1993). Linke in Gough (1993:83) quotes from one of the United Nations (UN) conferences: "Education and training on environmental problems are vital to the long-term success of environmental policies because they are the only means of mobilizing an enlightened and responsible population, and of securing the manpower needed for practical action programmes".

A number of national and international institutions have been developed as a result of global environmental crises. Some of the institutions are United Nations Education Social and Cultural Organisation (UNESCO), United Nations Environmental Programme (UNEP), International Environmental Education Programme (IEEP), International Union for Conservation of Nature and Natural Resources (IUCN), Environmental Protection Agency (EPA), Worldwide Fund for Nature (WWF), Environmental Education Association of Southern Africa (EESA) which come out in support of Environmental education (EE). Neal and Palmer (1994: 12) maintains "The support of key international institutions continued to raise the profile of environmental education during the 1970s, leading to the understanding of the aims, objectives and approaches to the subject". The Namibian Environmental Education Network (NEEN) was launched in 1991. The key objective of this network is to raise the profile of EE in all education sectors and to co-ordinate the activities of institutions that have an interest in this field.

In addition to the above developments, there are preceding and concurrent fields of education that have contributed to the development of EE as it is known today. Disinger in Wilke (1993:25) contends, "... the primary antecedents of today's environmental education were "Nature study", "Outdoor education" and "Conservation education". The above preceding fields of education have contributed to the development of EE as it is known today. Furthermore, Dreyer (1996:71) lists concurrent fields of education that have contributed to the formation of EE. These fields are resource education, progressive education, resource management education, population education and general education.

Today EE in many parts of the world has become an approach to all education that seeks to provide solutions to growing environmental problems, thereby improving the quality of life of human beings in communities. It is not intended to be a subject on its own but an approach to all education. It should permeate the whole curriculum in the school. Formal and non-formal educational institutions should therefore take a leading role in incorporating EE into the school curriculum. This could be true for Namibia because institutions such as the Ministry of Basic Education and Culture (MBEC) now the Ministry of Basic Education, Sport and Culture (MBESC), the Enviroteach (Et) Project of

Desert Research Foundation (DRFN) and Life Science (LS) Project of Ibis Namibia, amongst others, have already started with the incorporation of EE into the curriculum in a cross-curricular manner.

1.2 Aims of the study

Although Namibia was not involved in international conferences prior to the Agenda 21, the teaching of EE is based on the Tbilisi principles (refer to Chapter 2, p: 26-27). Secondly, Namibia is a signatory to the Earth summit's Agenda 21, which calls for incorporation of EE into the curriculum in a cross-curricular manner. Moreover, there are a number of documents that support the incorporation of EE into the curriculum as a cross-curricular subject (see Enviroteach, 1995,1998 and MBEC, 1997). It is within this framework that this study aims at finding out whether EE has been practically and effectively incorporated as a cross-curricular subject into the secondary school curriculum in Namibia.

Within the framework of the above aim, this study seeks to reach the following goals:

a) Determine the subjects used in the teaching of EE in the secondary school curriculum
b) Identify the barriers in the teaching of EE in the Namibian secondary school curriculum
c) Find out whether learners and teachers are respectively aware of environmental issues and EE in Namibia
d) Determine whether the environmental knowledge, attitudes and values as well as actions and skills of learners are incorporated into the Namibian secondary school curriculum in order to enable them to participate in environmental problem solving
e) Make recommendations for effective incorporation of EE into the Namibian secondary school curriculum

1.3 Statement of the problem

The Tbilisi declaration (1977) and Earth Summit's Agenda 21 (1992) have laid a foundation and provided major indicators for the incorporation of EE into the curriculum. These indicators maintain that EE should proceed from pre-school to the highest education level. Learners should identify symptoms and causes of potential environmental problems, a diversity of approaches must be utilized in the teaching of EE, learners should understand the political, ecological and economic interdependence of the modern world and EE must be interdisciplinary in its approach, drawing specific content from many subjects. In general these indicators show that EE should permeate all subjects in the school curriculum. In support of this approach and the teaching of EE, there are numerous publications that show how elements of the subject could be incorporated into teaching and learning situations. (See Wisconsin Department of Public Instruction (1991); Ramsey, Hungerford & Volk (1992); Newhouse (1990); Ballantyne & Packer (1996) and others).

Despite these numerous publications, EE continues to suffer barriers. Ham and Sewing (1988); Stone (1989) & Loubser (1997) maintains that a perceived lack of teacher preparation, lack of adequate funding, an already overcrowded curriculum, scarce or inadequate resources, untrained teachers, resistance to change, misconception about teaching and lack of knowledge about the discipline or field of study are some of the barriers that have prevented the effective incorporation of EE into the school curriculum. Furthermore, Malcolm (Undated: 20) argues: " Its development and implementation is seriously hindered by an emphasis on separate subject areas, conventional timetables, "text book" learning, traditional assessment methods". Since all the barriers given above could also be applicable in the Namibian education situation, it is imperative that educational authorities plan a strategy that will overcome most of them and ensure the incorporation of EE into the Namibian secondary school curriculum.

Teachers are important instruments in the process of overcoming these barriers. Sterling in Ballantyne and Oelofse (1989:9) supports the view that " the key to school commitment lies with the teachers". Neal and Palmer (1990:2) also argue, "every school

should make adequate arrangements for planning and implementing a programme of environmental education".

In the light of this view, this study attempts to look into whether secondary schools in Namibia have practically incorporated EE into the curriculum according to national and international recommendations. It will also assess what has to be done to ensure that EE is incorporated into the Namibian secondary school curriculum. Barriers that prevent the incorporation of EE into the curriculum will also be investigated. This process of investigation revolved around six key questions:

a) Is EE incorporated as a cross-curricular subject into the Namibian secondary school curriculum?
b) What attempts have been made to overcome barriers that EE teachers experience in the Namibian secondary school curriculum?
c) What subjects are used to teach elements of EE "About, Through and For" (Fien, 1993:15) (also see Section 1.6.2, p: 10-11) in the school system in Namibia?
d) Do teachers incorporate EE components, namely environmental knowledge, understanding, skills, values and attitudes in the teaching of their own subjects in the school curriculum?
e) How do teachers incorporate EE in the teaching of their subjects in the school curriculum?
f) How do learners in the Namibian secondary schools experience EE?

It is believed that these key questions will inform decision-making processes regarding the incorporation of EE within the curriculum of the secondary schools in Namibia.

1.4 Stating the hypotheses

Hypothesis 1

Even though EE is regarded as a cross-curricular subject in Namibia (see Enviroteach, 1995 and MBEC, 1997), the researcher hypothesise that EE, as an approach to all education, is not incorporated fully into the curriculum of Namibian secondary schools. A

discrepancy between what is advocated in the Ministry documents and what actually exists is suspected. EE teachers therefore experience curriculum related barriers.

Hypothesis 2

In EE there are three elements (see Section 1.3, p: 5) that should be incorporated into teaching and learning situations. UNESCO in Ballantyne & Packer (ibid: 25) contends, "environmental educators must provide students with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment". In the light of this statement, the researcher hypothesise that EE in Namibia is more knowledge-based with little or no room for inculcation of attitudes and values as well as the actions and skills dimensions of education for the environment.

1.5 The Methodology applied

Research cannot be carried out in a vacuum. There are paradigms that have influenced research in EE. Fien and Hillcoat in Williams (1996) identify the positivist, interpretive and critical research paradigms. They further maintain that the interpretive and critical research paradigms agree on a number of points. They all emphasise the exploration of meaning and understanding in a specific context. Data reduction is essential. According to Odman and Kerdeman in Keeves (1997: 186) the purpose of the interpretive paradigm or Hermeneutics is to "increase understanding as regards cultures, groups, individuals, conditions, and life styles, present as well as past". Fien (1993:22) maintains "the socially critical orientation in education sees schools, teachers and students as active members of society who, through critical reflection and action in society, may free themselves from hegemonic influences of consumerism, the media and other vested interests". Williams (ibid: 6) argues that the positivist paradigm emphasises phenomena that can be carefully observed, accurately recorded and classified. Data are presented in numeric form using a variety of statistical strategies and techniques. Determination of dependent and independent variables are important in this paradigm.

In touch with modern research paradigms, this study employs both qualitative and quantitative approaches. These approaches are rooted in interpretive, critical, and

positivist research traditions. In qualitative research the aim is to explore, investigate and understand events, views, and circumstances under which EE is taught in the secondary schools in Namibia. Quantitative research methodology includes the fact that data will be collected, coded, analysed and presented in numeric form using tables and figures. The researcher will critically interpret the results and propose recommendations that are meant to improve the teaching of EE in the Namibian secondary schools.

Firstly, the researcher's approach to the teaching of EE resides in 'hands on' learning. This is an approach to learning whereby "students and teachers participate more fully in the planning, implementation, and evaluation of educational activities aimed at resolving an environmental issue that the learners have identified" (Wals; Beringer, & Stapp 1989). This approach to learning also calls for the involvement of learners using their senses. In this regard learners should be given the opportunity to touch, see, smell and feel the object being taught to ensure that they are involved rather than just giving factual information.

Secondly, the researcher believes in the "Gestalt approach" (Curzon 1990:71) that calls for the involvement of all components rather than the parts. In the context of this study 'Gestalt approach' refers to the approach that combine all elements of EE (see Section 1.3, p: 5) into the teaching and learning situations. Curzon (ibid: 71) maintains that in the "Gestalt approach":

> it is the total structured form of an individual's mental experience with which the psychologist and the teacher ought to be concerned; the attributes of the whole are not entirely deducible from an analysis of constituent elements. The whole itself, as well as its individual components, may be considered as possessing properties.

The researcher supports the teaching of EE whereby the elements of knowledge, attitudes and values as well as action and skills are incorporated in the teaching and learning situation so that learners may experience them all.

1.6 Explanation of major concepts

1.6.1 The concept 'Cross-curricular teaching'

In the context of this study, cross-curricular teaching is regarded as a means through which EE could be incorporated into the curriculum. There are many definitions of cross-curricular teaching, in this context cross-curricular teaching is defined as an approach where a variety of subjects are used to teach one theme.

Some concepts are essential in understanding cross-curricular teaching. These concepts include the integration approach, the interdisciplinary (single subject approach) and the multidisciplinary (infusion approach). These concepts will be briefly explained below.

- Integration

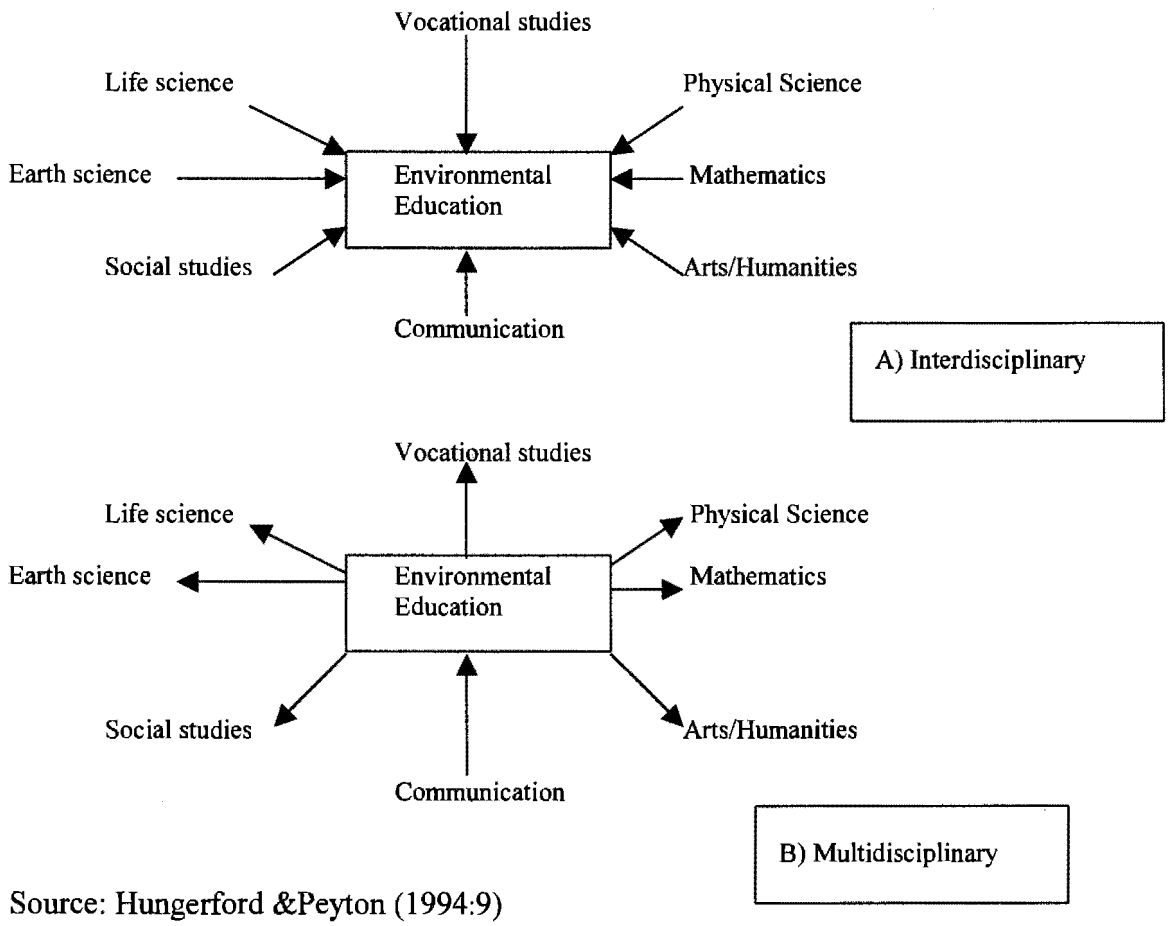
In the context of this study, integration and incorporation will be used interchangeably. Muyanda-Mutebi (2000:5) contends that "in environmental education, integration means examining a problem or issue from the perspective of natural sciences, social sciences and humanities ... no subject should stand alone in the school curriculum". Moreover, Ruskey & Wilkey (1994:) argue, "in an integrated curriculum, the skills, concepts, and attitudes of the major disciplines (Science, Social Studies, Language Arts, Mathematics) are compared and interrelated". In this respect integration is defined as a process whereby concepts, skills, attitudes and values, characteristics of EE, are examined and taught through the lens and perspectives of natural sciences, social sciences and the humanities.

- Interdisciplinary Approach (single subject) and Multidisciplinary Approach (infusion)

Figure 1 p: 9, shows two approaches that can be used to integrate EE into the curriculum. Interdisciplinary (Model A) represent the single subject approach where information is drawn from various subjects and combined into one when EE is taught. This model demonstrates the holistic nature of EE because it shows that all subjects could have EE

components. The Multidisciplinary model (Model B) exhibits EE content as being incorporated into other subjects. This approach requires co-ordination at school level. Each of these approaches has advantages and disadvantages (see Table 1, p: 13).

Figure 1: Interdisciplinary versus Multidisciplinary approaches for EE



Source: Hungerford &Peyton (1994:9)

1.6.2 The concept 'Environmental education'

EE is an approach to all education that originated about 30 years ago. "Now it has gained world wide recognition, forming the basis of major national and international environmental strategies..." (Tilbury and Walford in Williams (1996:51). Since the origin of this concept, there have been numerous definitions that have been provided. Disinger (1983) presents three groups of environmental educationists who illustrate the

dilemmas associated with environmental education's definitional problem. He contends that:

> There are those who strive to achieve universal agreement as to a precise meaning and discrete set of descriptive parameters, but others who prefer not to expend energy on what they perceive as an inherently non-productive exercise. There also exists a third population, a potpourri of groups and individuals who have independently or semi-autonomously forwarded a variety of definitions and descriptive statements, on occasion demonstrating strong overlap and, on occasion, equally virulent disagreement.

In this context, it is felt that a definition is important because it does provide precise meaning and sets the universal parameters on which to operate. It is also important to state that different definitions may be accepted only if they reflect the essential characteristics of EE.

Though there are numerous definitions, the researcher accepts the definition that has been provided by the IUCN. The IUCN in Neal and Palmer (1990:2) maintains that:

> Environmental education is the process of recognizing 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. Environmental education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality.

Firstly, the above definition implicitly and explicitly reflects some distinctive elements (see Section 1.3, p: 5) that are essential in understanding EE. Education *About* the environment inculcates knowledge and understanding. Martin in Martin and Wheeler (1975:24) maintains that education *About* the environment " has its central objective the acquisition of knowledge about that environment. In this case the environment provides the learning situation in which a range of skills can be developed to achieve desired

knowledge". The second element of EE is Education In/Through the environment. This element develops environmentally related actions and skills. This is clearly shown by Neal and Palmer (ibid: 29) when they maintain, "education in and through the environment uses the environment as a resource for learning. It is a resource which enables the development of a great deal of knowledge and understanding as well as skills in investigation and communication". The third element is Education for the environment that inculcates the attitudes and values, skills and knowledge necessary for the maintenance and protection of the environment. Palmer (1998:144) maintains " such learning will link with development of attitudes and values, including elements of and reflections on human understanding and behaviour necessary for the development of sustainable living patterns and caring use of planet and its resources".

A comprehensive EE programme incorporates all elements of EE into the learning and teaching situations of the discipline (see Section 1.3, p: 5).

Secondly, the above definition implicitly reflects the political, economic, social, and biophysical dimensions of the environment, which are the focus of EE. This is because the concept of environment has been broadened to include not only the bio-physical environment but also the social, economic and political reality in which people find themselves. In this respect Van Rooyen (1998:118) has written "EE focuses not only on these dimensions but also on a set of links between these different dimensions of the environment". A variety of subjects in the school curriculum can be used to address these components.

In the teaching of EE, an interdisciplinary (single subject approach) and/ or a multidisciplinary (infusion approach) are possible strategies. Hungerford and Peyton (ibid: 10) give advantages and disadvantages of these approaches. These advantages and disadvantages are briefly explained as shown below in Table 1, p: 13.

- As can be seen in Table 1, the Interdisciplinary (single subject) model is easier to implement as a single subject, requires fewer teachers but with more in-

depth training in EE, and therefore it is less demanding in terms of teacher numbers but more demanding in terms of competencies required by teachers in EE. The Multidisciplinary (infusion) model requires that teachers of all disciplines be trained but not to the same depth as in single subject approaches.

- Secondly, the Interdisciplinary (single subject) model requires the addition of EE to an already overcrowded curriculum and components are easier to identify and evaluate. The Multidisciplinary (infusion) model does not require the addition of the subject to an overcrowded curriculum so it makes minimal demands on existing curricular components. This means that components must be identified and incorporated into the existing curriculum.

- Thirdly, the Interdisciplinary (single subject) model is not so effective in teaching for transfer while the Multidisciplinary (infusion) model is an effective model in the teaching for transfer. Teaching for transfer is highlighted here because it is important in teaching and learning of EE across the curriculum. According to Berliner (1991:306) "the process that enables us to make previously learned responses in new situations is called *transfer*. Transfer often, but not always, allows us to perform sensibly and adequately in a new task". In the context of this study, teaching for transfer refers to a style of teaching, which enables learners to apply EE concepts and skills across subjects and in real life situations.

Although the implementation of both or one of these approaches is expensive the researcher supports the Multidisciplinary approach to the teaching of EE. This approach facilitates teaching for transfer and in this way enhance understanding of the subject matter on the part of a learner (see advantages in Table 1,p: 13).

Table 1: Advantages and disadvantages of Interdisciplinary (single subject) and Multidisciplinary (Infusion) formats for EE

Considerations	**Interdisciplinary (Single Subject) characteristics**	**Multidisciplinary (Infusion) characteristics**
1. Ease of Implementation	Easier to implement as a single subject if time permits in the curriculum; teacher training is less of a problem	Requires that more teachers be trained; greater coordination of the curriculum necessary; requires less time/ content in the existing curriculum
2.Teacher competencies	May require fewer teachers but with more in-depth training in EE; thus teacher training is less demanding in terms of teacher numbers but more demanding in term of level of competencies required	Requires teachers of all disciplines to be competent to adapt and/ or use EE material, although perhaps not to the same depth as in single subject approaches
3. Demand on curriculum load	Requires addition of this discipline to an already overcrowded curriculum	May be effectively implemented with minimal demands on existing curricular load
4. Ease of curriculum development	Components easier to identify and sequence	May be effectively identified, sequenced, and accommodated by the existing curriculum
5. Evaluation	A comprehensive evaluation is much easier to accomplish in a singe subject curriculum	Comprehensive evaluation difficult due to the number of variables involved
6. Age level appropriateness	May be appropriate at secondary than elementary level. For some types of EE goals, may be appropriate at secondary and tertiary levels	Appropriate at all age levels with some exceptions at secondary and tertiary level
7.Effectiveness on teaching for transfer	More difficult to use in effectively teaching for transfer, requires special efforts to do so	Teaching for transfer is inherent in approach when properly used. Infusion permits decision-making to take place in other disciplines in an environmental context
8.Ability to provide in-depth coverage of environmental issues	Budgetary consideration entirely dependent on the nature of the course being developed. A highly sophisticated course demanding many field excursions or laboratory equipment could prove costly	Monetary consideration very dependent on the nature of the curriculum being developed. Monies required could be greater than in single subject curriculum due to numbers of learners involved across numerous(age) levels

Source: Hungerford & Peyton (1994:10)

1.6.3 The concept 'Curriculum'

The word curriculum is derived from Latin 'Curri' "which referred to school subjects from nursery to university" (Salia-bao, 1989:3). Curriculum is one concept which is difficult to define. Salia-bao (ibid: 2) maintains "This is partly because a curriculum even in the West reflects a complex society, a society in which there is never a perfect agreement on its own characteristics. Defining curriculum is also complex because of uncertainties about proper school roles and validity of practices". Carl (1995:32) contends "curriculum is thus a broad concept which includes all planned activities which take place during the normal school day. It also includes after-school planned activities such as societies and sport". In the context of this study, the researcher refers to the curriculum as all school subjects, aims, goals and objectives, methods of teaching, evaluation, learners' experiences and all activities (planned and unplanned), which are intended for the education of school learners in Namibia.

Curriculum decision-making takes place at three levels. In Namibia, the Macro level is restricted to the Ministerial level. This level includes the National Institute of Educational Development (NIED). Each of the seven educational regions (refer to Chapter 3, p: 32-33) in Namibia implements the curriculum decisions made at this level. The Meso level is the school level of curriculum decision-making and includes decisions made by the school authorities (principals and head of departments). This level does the actual implementation of the decisions made by the Macro level decision makers. The Micro level represents teachers and learners in the classroom as curriculum decision makers.

1.6.4 The concept 'Secondary school'

Hornby (1995) defines secondary school as a "school for young people of 11 – 18 years". In Namibia, the secondary school has two phases. That is the Junior Secondary Phase (JSP) and the Senior Secondary Phase. As can be seen in Table 2, p: 15, the JSP is the last three grades of Basic Education. It consists of grades 8 –10 (formerly standards 6 -8). This phase follows the junior secondary school curriculum. The Senior Secondary Phase represents the final two grades shown in Table 3, p: 15. This phase proceeds from

Grade 11 – 12 (formerly standard 9 –10). This phase follows the Higher/ International General Certificate of Secondary Education (H/ IGCSE) curriculum.

Table 2: The structure of Formal Basic Education in Namibia

NORMAL AGE		
6-7 Yrs	GRADE 1 (Incorporating School Readiness Education)	LOWER PRIMARY PHASE
7-8 Yrs	GRADE 2	
8-9 Yrs	GRADE 3	
9-10 Yrs	GRADE 4	
10-11 Yrs	GRADE 5	UPPER PRIMARY PHASE
11-12 Yrs	GRADE 6	
12-13 Yrs	GRADE 7	
	Examination for the Senior Primary Education	
13-14 Yrs	GRADE 8	JUNIOR SECONDARY PHASE
14-15Yrs	GRADE 9	
15-16Yrs	GRADE 10	
	Examination for the Junior Secondary Certificate (JSC)	

Source: Ministry of Basic Education and Culture (1993:16)

Table 3: The structure of senior secondary education in Namibia

16-17 Yrs	GRADE 11	SENIOR SECONDARY PHASE
17-18 Yrs	GRADE 12	
	Examination for the Higher/ International General Certificate of Secondary Education	

1.7 Chapter Division

In **Chapter 1** the international perspectives on EE with reference to Namibia have been discussed. The aim, goals and hypotheses of the study have been outlined. All other elements such as the methodology applied and the explanation of concepts that are essential to the understanding of EE in the context of this study have been explained. The **remainder** of the dissertation is structured as follows.

Chapter 2 reviews efforts taken by the Namibian education authorities to incorporate EE into the Namibian secondary school curriculum. It is also stated that though there are such efforts, the incorporation of EE in Namibia has remained largely problematic.

Chapter 3 reflects on the theoretical and practical underpinnings of the research as it relates to this study.

Chapter 4 presents the results of this research and provides relevant discussion.

Chapter 5 presents the conclusions, limitations as well as recommendations for effective incorporation of EE into the secondary school curriculum in Namibia. The testing of hypotheses and the implication for further research are also shown in this chapter.

Chapter 2: Efforts to incorporate EE into secondary schools in Namibia

2.1 Introduction

As has been stated in Chapter 1, it is generally accepted that EE as an approach to all education should be incorporated into the school curriculum. This general acceptance is also true for Namibia. In the light of this, the aim of this chapter is to review efforts that have been made regarding the incorporation of EE in Namibian secondary schools.

2.2 Background

Namibia obtained its independence from the apartheid government of South Africa on the 21st March 1990. Before independence, education in Namibian was fragmented and divided into 11 education authorities on the basis of race, colour and economic status (Cohen (1994); Salia-bao (1991). Even with this fragmented educational structure, EE was accorded a place in the broad curriculum for schools in different ethnic groupings. General Science was a subject that carried EE components for the Junior Secondary Phase while in the Senior Secondary Phase, Biology and Geography were the main carrier subjects. The syllabuses for these subjects were theoretical in nature and not fully developed to fit the Namibian content.

When Namibia became independent the 11-second tier educational authorities were dissolved and transformed into one national educational authority, which is known today as the MBESC. It can be said that independence stimulated many changes and developments, which in turn influenced the political, philosophical, psychological and sociological aspects of education in Namibia.

The achievement of independence represented a shift from teacher centred education to learner centred education. This means that the status of the teacher as a sole proprietor of knowledge changed. The learner is viewed as an active participant in the process of

teaching and learning. This policy holds implications for EE because it represents a democratic style of teaching advocated by environmental educationalists.

The most important *change* regarding EE in Namibia began with the adoption of the constitution for an independent Republic of Namibia. Article 95 of the Namibian constitution has special significance and influence on EE:

> The state shall actively promote and maintain the welfare of the people by adopting, interalia, policies aimed at...maintenance of ecosystem, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory

Another salient feature influencing the change and reform process included the development of broad aims of education. Amukugo (1993: 198) maintains:

> The Ministry of Education and Culture launched the Etosha conference, which identified broad aims of reform as the promotion of equal opportunities for schooling, the enhancement of efficiency, and the improvement of the quality of educational provision, which includes curriculum reform at the various educational levels.

The conference also identified various aims covering different learning areas in the broad curriculum. Aims that had direct relevance to EE were also developed.

Accordingly the MBEC (1997:8) reflected these aims in 3.10 as follows:

3.10.1 develop understanding of the dynamic interdependence of living and non-living things and the environment;

3.10.2 develop a sense of responsibility for restoring and maintaining ecological balances through the sustainable management of natural resources;

3.10. promote the learner's involvement in practical activities to preserve and sustain the natural environment; and

3.10.4 lay a foundation for informed and responsible attitudes and choices towards the balance of population growth, ecological sustainability and quality of life for all Namibians.

In view of the constitutional obligation reflected in the above aims, the MBEC developed syllabuses for subjects that should have addressed environmental issues. As a result of the obligation to environmental issues, a special subject called Life science was developed in the JSP broad curriculum. This subject combining biology and ecology was placed in the Social science and Economic area of learning in the broad curriculum. Life science is "based on a Syllabus developed at Loudima College in Congo for SWAPO during the time of conflict" (Olivier 1994). In the Senior Secondary Phase, H/ IGCSE broad curriculum, Biology, Geography, Chemistry and Natural economy syllabuses were developed after independence.

In 1992, the Ministry of Wildlife, Conservation and Tourism (MWCT), now Ministry of Environment and Tourism (MET), prepared a 'Green Plan' that was presented by the Head of State at the Earth Summit's Agenda 21 in that year. The 'Green Plan' is a 174-page document to which more than 25 institutions including the then Ministry of Basic Education and Culture (MBEC) and the University of Namibia (UNAM) contributed. This document demonstrated the commitment of the government of the Republic of Namibia to the protection and improvement of the environment and more importantly, the incorporation of EE into the school curricula. The MWCT (1992:100) has a section entitled *Preparing for the Future: Education and Sustainable Development.* This section maintains, "Namibia's goal is to increase awareness and knowledge, and develop skills and attitudes amongst young Namibians conducive to a harmonious relationship with the environment". Furthermore, the Green Plan acknowledged, " the concept of environmental education (EE) in the educational structure in Namibia is quite new, but the government is committed to ensuring that EE becomes part of every pupil's learning experience".

The Ministry of Mines and Energy & Danish Cooperation for Environment and Development (DANCED) (2001:6) further presents EE developments:

> Since the independence in 1990, there have been a number of important environmental education (EE) initiatives in Namibia. The Ministry of Basic Education and Culture (MBESC), in particular their National Institute for Education Development (NIED) with support from Ibis, has played a prominent role in supporting the Life Science Project and the school-based Forest Awareness and Tree Planting Project (FATPP). Furthermore, the Ministry of Basic Education and Culture, communities and the Ministry of Environment and Tourism (MET) have jointly established the Maria Mwengere Environmental and Cultural Exchange Centre in Kavango Region. Other significant environmental education initiatives include: The Desert Research Foundation's (DRFN) Enviro Teach Project, the Rossing Foundation's Environmental Education Clubs, the establishment of the Waterberg and Namutoni Environmental Education Centres by the MET, support to teachers in Kunene Region from Integrated Rural Development and Nature Conservation and the establishment of the Namibian Environment Education Network (NEEN).

The establishment of NEEN has been a milestone in the history of EE in Namibia (refer to Chapter 1, p: 2-3). This national network also facilitates information sharing in EE. A Namibian environmental education policy was drawn up and presented to the Presidential Commission on Education in 2000. The NEEN policy statement (1999) maintains that:

> Namibia will actively encourage, support and implement environmental education as a means of achieving and fulfilling article 95 of the constitution. Environmental education should aim to empower Namibians, from all sectors, to critically evaluate environmental information and options, to make informed decisions, and to take actions that will contribute to the goal of environmental and economic sustainability.

The provisions of the policy (see Appendix 2) were seen as important for Namibian education by the Presidential Commission and hence recommended that they should serve as the basis for the incorporation of EE in the Namibian secondary school curriculum.

2.3 The role of projects in incorporating EE into the Namibian secondary school curriculum

In Namibia, there are various projects that contributed to the incorporation of EE (refer to Chapter 1, p: 2-3). A new EE project started in October 2001.The new project initially called Environment, School and Society is currently in the final stage of development to ensure that maximum incorporation of EE in Namibia is achieved.

All projects worked or will have to work in tandem with NIED. A brief explanation of each of these projects follows below.

2.3.1 The Enviroteach (Et) Project

Et was a project run in conjunction with the MBEC. It was sponsored by the Swedish International Development Agency (SIDA) and coordinated by a team at the DRFN. The project proceeded in stages as outlined below:

Pilot phase	1992 – 1995
Investigation phase 1	1995
Enviroteach phase 2	1996 - 1998
Consolidation phase	1999 (Taken from: Kristensen, 1999:14)

The stages shown above will be briefly explained below.

- **The Pilot Phase (1992-1995)**

The pilot phase was the first phase of the Et project. The aim of the Et project was to explore options for the incorporation of EE in the Namibian secondary schools and get a qualitative feel of what was needed in Namibia in terms of the incorporation of EE. The options that were explored included whether EE should be incorporated as a separate subject or part of the whole curriculum. Both these approaches were considered, however Enviroteach (1998:15) maintains that:

> It was considered that including environmental education as a separate subject would have required teachers trained in the subject, new textbooks, separate exam papers, and all of the managerial structure required for the administration of a new and separate subject... this was quite simply beyond the means of the Ministry of Education and Culture.

The Et report maintains that this phase was designed and implemented into 25 schools and ran for three years. Care was taken to ensure that schools in rural and urban areas were represented. Enviroteach (ibid: 14) maintains that "Over the course of three years of the pilot phase, 10 cross-curricula teacher resource manuals were produced, tested and revised, and a number of different approaches to integrating and infusing environmental education as practised in Namibian schools were tested". The cross-curricular teacher resource manuals showed teachers how EE is taught across the curriculum. They also provided information on EE and devised approaches that support EE through the use of a variety of learner centred methods and instructional resources.

- **Investigation phase 1 (1995)**

The investigation phase explored the possibilities for incorporating EE into the Basic Education Teacher Diploma (BETD) programme. This phase drew upon mechanisms that ensured the incorporation of EE into the curriculum of the BETD. It highlighted the importance of teacher training in incorporating EE. The efforts led to the introduction of Integrated Natural Science into the curriculum of the BETD. This subject informs teachers trained at this level about EE.

- **The Enviroteach phase 2 (1996-1998)**

This phase was concerned with the implementation of the Et philosophy and the recommendations into the four colleges of education. The philosophy advocated in this regard calls for teaching of EE in a cross-curricular learner centred manner. According to Fröhlich (2001: personal comm.) teacher educators found it difficult to understand both cross-curricular and learner centred approaches to teaching of EE in Namibia since these concepts were new to them.

- **The consolidation phase (1999)**

According to Kristensen (ibid: 21) the overall goal of the consolidation phases was to contribute to a firm environmental education base in Namibian formal education.

Sub-goals of the consolidation phase were:

Formal education has assumed ownership of aspects of environmental education and taken on relevant components of enviroteach philosophy;

The MBEC has integrated aspects of environmental education into formal education and are implementing them with ongoing activities.

At the end of the consolidation phase the guidelines for the incorporation of EE into the four colleges of education were drawn up and implemented. A desktop analysis of EE into the Namibian formal education was also presented. The consolidation phase also represented a transition from the Et project into the new project that began in October 2001 (refer to Section 2.3, p: 21). Lessons learnt from the Et project will be incorporated into the new project.

2.3.2 The Life Science (LS) Project

The LS project started in 1991, immediately after the independence of Namibia. This project is a continuation of the project developed by Ibis, Namibia (which was known as World University Service (WUS) Denmark during that time) for South West Africa People's Organisation (SWAPO) during the time of the struggle for independence. When the country became independent, the Namibian education authorities asked the project to

continue its operations in Namibia. The LS was therefore a project in partnership between the MBEC as well as Ibis (WUS Denmark). Danish International Development Agency (DANIDA) sponsored the project. This project was tasked with the development and introduction of Life Science in the JSP (see Section 2.2, p: 19).

According to van Harmelen, et al (2000:2) the major components of the LS project were:

- Curriculum development and the production of learning materials. In this regard the project assisted NIED, as members and conveners of various ministerial working groups and curriculum co-ordinating committees in the development and revision of syllabuses for Ls grades, 8-10, NSHE grades 4 – 7, Environmental studies grades 1-3 and Agriculture grades 7-10. The Life Science project developed and distributed textbooks and other learning support materials (LSMS) to both LS and NSHE.
- The supply of teaching equipment to schools/ institutions. The project identified, purchased and distributed basic laboratory and field equipment to all upper Primary and Junior Secondary schools to teacher Training Colleges and Teacher Resource Centres.
- In-service and Pre-service Teacher education. All teachers of Ls and NSHE were reached through in-service development either at national, regional or local workshops, cluster meetings and / or school visits. A special programme to support pre-service educators was undertaken during 1997,1998. The in-service programme was designed to develop subject knowledge and teachers' pedagogical knowledge, through enhancing their methodological and didactic skills to enable them to adopt a learner centred approach.

As can be seen the components mentioned above, supported the Namibian education authorities in the areas of the production of materials for Life science, revision of syllabus, teaching equipment and more importantly, maintained the training of pre-service and in-service teachers.

According to Avenstrup in van Harmelen (ibid:8) the project proceeded in the following stages:

Pilot Phase 1991 – 1993

Phase two 1994- 1998

Phasing out 1999- 2000

At the phasing out stage of the project, "Life Science became a fully developed subject, teachers were trained to teach it. A core of advisors that are well equipped to support teachers were trained and it is running without external support" Kristensen (2001: personal comm.).

2.3.3 Further support of EE in Namibia

Another EE project started in October 2001 (see Section 2.3, p: 21). This project will be based at NIED and is funded by DANCED. The project is a joint effort between Ibis Namibia, the DRFN and the MBESC. It focuses on broader socio-economic, socio-political and development issues that EE should address holistically. It is hoped that a number of issues that were not covered in the Et and the LS Projects will be covered. These issues are comprehension programmes aimed at the formal and informal education sectors. It will incorporate participative research, action and reflection and apply competency measures.

2.4 Guidelines for the incorporation of EE into the secondary school curriculum in Namibia

Namibia is a signatory to international treaties on the environment. Among the treaties and international conventions are Agenda 21 and Earth Summit; SADC Policy and Strategy for Environment and Sustainable Development: Towards equity led growth and Sustainable Development in Southern Africa; International Convention to Combat Desertification; The Convention on Biological Diversity; Sub-regional Action Programme to Combat Desertification in Southern Africa (SRAP); The International Convention on Climate Change; Convention for International Trade in Endangered

Species (CITES). These conventions and international treaties have shaped the introduction of EE in Namibia. In formal education, however, the teaching of EE is based on the principles of the Tbilisi declaration (See Enviroteach, 1995; NEEN, 1999).

1. **Consider the environment in totality,** including natural and built, technological and social, political, moral, cultural, historical, and aesthetic aspects
2. **Be a continuous life long process:** It should begin at pre school level and continue through all formal and non-formal stages
3. **Be Interdisciplinary in its approach,** drawing on the specific content of each discipline to make a holistic and balanced perspective
4. **Examine major environmental issues** from a local, national, regional and international point of view so that learners receive insights into environmental conditions in other geographical areas
5. **Focus on current and future environmental situations,** while taking into account the historical perspective
6. **Promote the value and necessity of local, national and international co-operation** in preventing and solving environmental problems
7. **Explicitly consider environmental aspects in plans for development and growth**
8. **Enable learners to have a role in planning their learning experiences** and provide an opportunity for making decisions and accepting their consequences
9. **Relate environmental sensitivity, knowledge, problem-solving skills, and values clarification to every age,** but with special emphasis on environmental sensitivity to the learner's own community in earlier years
10. **Help learners discover the symptoms and real causes of environmental problems**
11. **Emphasize the complexity of environmental problems** and thus the need to develop critical and problem-solving skills

12. **Use different learning situations and a variety of educational approaches** to teaching and learning about the environment, with emphasis on activities and first-hand experience.

In view of these principles, and the Earth Summit's Agenda 21, environmental awareness, population education and health education are regarded as cross-curricular themes in the broad curriculum for secondary schools in Namibia. In this regard the MBEC (1997:27) maintains that:

> These are anchored in the syllabuses of various carrier subjects, where the theme corresponds to the subject content. In order for learners to experience the inter-relatedness of different subject disciplines in understanding such issues, aspects of a topic from different subjects should be co-coordinated in lesson plans, so that the same topic is treated at the same time in different subjects. This will also facilitate opening up the timetable for a block of time to do cross-curricular project work.

This means that the policy of the MBESC regards EE as an approach to all education in which all subjects should contribute whenever possible. The hypothesis 1 (see Chapter 1, p: 5-6) disputes the above statement and suspects a discrepancy between what is written in official documents and what actually happens on the ground. This is one aspect that will be investigated in this study.

Furthermore, at independence the Namibian government considered the introduction of EE both as a cross cutting subject and a separate course; however they expressed concern about the inclusion of EE as a separate course (refer to Section 2.3.1, p: 22). In view of this, it can be said that EE should be an approach to education, which is to be integrated into other subjects. This is yet to be investigated.

2.5 Why the Namibian government has decided to incorporate EE into the secondary school curriculum

There are various reasons why the MBESC has decided to incorporate EE into the curriculum of the secondary schools in Namibia. These reasons stem from environmental, political and educational factors.

Among the environmental reasons, Namibia is an arid country. There are no perennial rivers within the country except at the borders and it experiences low and unpredictable annual rainfall except in the northern parts of the country (see Heyns; Montgomery; Pallet & Seely, 1998). This state of the Namibian environment makes the land very sensitive to mismanagement and environmental destruction. Through EE, the school groups and communities at large will be informed about the vulnerability of their environment and encouraged to take concerted actions aimed at its improvement and maintenance.

In addition to the above, Namibia faces other environmental problems. Moyo; O'Keefe & Sill (1993) list degradation, deforestation, rural land use conflicts, pollution, urban land use conflicts, water and fish resources, survival of wildlife, overstocking and overgrazing and bush encroachment. The extent to which we can solve these problems depends on if and how EE is incorporated in the school today. Bones (1994:15) contends that "Today's students are tomorrow's leaders and decision makers, they need to learn and practice the skills necessary to protect, preserve and restore the environment".

Moreover, environmental problems are international problems. How do we keep to the most quoted slogan of 'thinking globally and acting locally' if EE is not part of the Namibian school curriculum? In order to maintain international cooperation, we need to improve the provision of EE in the country at large. Through EE, learners will come to know and understand that through acting responsibly at a local level, they are maintaining international co-operation. In light of reasons such as the above the Ministry of Mines and Energy & DANCED (ibid: 6) maintains:

In order to increase the population's awareness of these environmental problems, and to promote more sustainable natural resource management practices, the government of the Republic of Namibia has identified environmental education within formal, non-formal and informal sectors as a priority and numerous policy documents make reference to this.

The incorporation of EE into the Namibian secondary school curriculum is important because it leads to the acquisition of skills necessary for the maintenance and improvement of the environment. This is also shown by Bones (ibid: 15) when he maintains that "Quality environmental education will lead to the acquisition of knowledge, the development of analytical skills, the beginning of conscious environmental attitudes and ultimately to environmentally responsible behavior".

Improving the quality of teaching is also a reason why the Namibian government has decided to incorporate EE in the curriculum (Sampson, 2001:personal comm.). One of the goals of education in Namibia is improving the quality of educational provision. In this respect the Ministry of Education and Culture (MEC) (1993:37) contends that " our third major is to make our schools good schools and to offer high quality alternatives to formal schools... it is essential, therefore, that we help our teachers develop their expertise and skills that will enable them to stimulate learning". EE could be used as an approach to all education that will also ensure that the goal of quality in education is achieved in Namibia. The National Curriculum Council in Hale (1993:133) maintains "Environmental education is about improving the quality of experience of the whole curriculum, using curriculum time more effectively, and the imaginative use of teaching approaches and resources". The fact that EE is incorporated into the other disciplines as a means of enhancing quality in education does not mean that its aims, goals and objectives will not be realised. In this regard Bornman (1997a: 56) maintains, " Through the curriculum of other disciplines the aims, goals and objectives of environmental education would also be achieved". It can be concluded that effective incorporation of EE elements will not only lead to the improvement of quality of educational provision but also ensure the effective and efficient use of teaching and learning resources at school.

Furthermore, the "curriculum in the Namibian schools is overloaded" (Sampson 2001:personal comm.). EE as a separate subject would be impossible and undesirable. This is true because there are many subjects such as Economics, Geography, Physical science, Life skills, Music, Physical training, Accounting, Mathematics, Developments studies, Agriculture science, Biology, Afrikaans, History, Business management, and English in the broad curriculum for secondary schools in Namibia. Including EE as a separate course could pose implementation problems.

2.6 Conclusion

In this chapter, efforts to incorporate EE in Namibia as well as the historical review have been presented. NIED (A professional arm of the MBESC), the Et project of the DRFN and the LS project of Ibis Namibia have played a significant role in incorporating EE in formal education in Namibia. The efforts made by these institutions have strongly emphasised the development and incorporation of EE into Basic Education in Namibia. This means that the JSP is a phase that has been influenced in the process. The Senior Secondary Phase has not been influenced by these developments. The reason for this is that control of the senior secondary broad curriculum (H/ IGCSE) is based in U.K at Cambridge University. As soon as Namibia assumes total control over curriculum of the Senior Secondary Phase, efforts made by projects outlined above will have an influence over the Senior Secondary Phase.

Although it became national policy that all schools in Namibia incorporate EE into the curriculum, its practical implementation, even in the JSP, remained largely problematic. This study will investigate this and more importantly investigate the existence of structures that would facilitate the incorporation of EE into all phases of the secondary school curriculum in Namibia. It will also propose recommendations that would facilitate the incorporation of EE into the phases of the secondary school curriculum.

Chapter 3: The research procedure

3.1 Introduction

In Chapter 2 the developments that led to the incorporation of EE in Namibia were reviewed. Chapter 3 aims at discussing the theoretical and practical issues relevant to the research procedure of this study. It will investigate how well EE is incorporated into the Namibian secondary school curriculum.

In Namibia EE is a new concept, a concept whose origin can be traced back to about a decade ago (see Chapter 2). Furthermore, there are barriers that surround the incorporation (see Chapter 5, p: 69) of EE into the Namibian secondary school curriculum. This state of affairs underlines the fundamental importance of research in EE in Namibia.

In Geography and EE there are paradigms or worldviews that guide the research process (refer to Chapter 1, p: 6). The different educational research approaches can be categorised under these broad paradigms. First is qualitative research (refer to Chapter 1, p: 6). In this type of research figures and numbers do not matter but the focus is on understanding events, meanings and situations of a problem under investigation. According to Woods (1999:3) a "qualitative researcher seeks to discover the meanings that participants attach to their behaviour, how they interpret situations and their perspectives are on particular issues. Just as situations can influence perspective, so people can redefine and construct situations". Qualitative research will be used in this investigation through gathering of information from the macro level respondents. No numbers and figures will be used (refer to Chapter 4, p: 39-41). In this case data were drawn from respondents and then entered into the relevant section.

The second type of research is quantitative research (refer to Chapter 1, p: 6-7). This is a type of research whereby numbers are used to interpret data. According to Hittleman and Simon (1997:31) "quantitative research is characterized by the use of statistical analysis.

Three basic quantitative research purposes are to describe, to compare, and attribute causality. Each of these purposes is fulfilled through the assignment of numerical values to variables and mathematical analyses of those values". In context of this study, quantitative research will be used to quantify data through the use of tables and graphs (refer to Chapter 4, p: 41-67).

The third type of research is applied research. This is the type of research whereby theories are tested in practice. Best and Kahn (1993:23) maintain that the purpose of applied research " is improving a product or a process- testing theoretical concepts in actual problem situations". In EE applied research may be used to test the dominant theories in this field. Although this type of research is important in EE, it will not feature strongly in this investigation. This is because the aim and goals of the study (refer to Chapter 1, p: 3) are not to test a theory in EE.

The fourth type of research is action research. This type of research also is important in EE. Best and Kahn (ibid: 24) maintain, "Its purpose is to improve school practices and, at the same time improve those who want to improve practices". Action research does not aim at gathering scientific knowledge but on improving the practices in teaching situations. According to Ferreira and Loubser (1997:37) "action research in environmental education can support teachers by helping them cope with challenges and problems of environmental education. Experience with action research has indicated that teachers can do this successfully and they can achieve remarkable results in this field". Although this study dwells heavily on qualitative and quantitative research approaches only, the researcher believes that the implementation of recommendations to be made in this study could solve some of the problems that EE teachers face in Namibia.

3.2 The research sample

There are seven educational regions in Namibia. These are Windhoek, Caprivi, Rundu, Keetmanshoop, Erongo, Ondangwa East and Ondangwa West. The aim was to reach all seven educational regions but due to the limited scope of the study, logistical and financial constraints plus a requirement to complete it within one year, a decision was

made to reach only a total of 10 schools within six educational regions of Namibia. Two schools in each of the regions of Windhoek, Caprivi, Rundu and Erongo were contacted while only one school in each of the regions of Keetmanshoop and Ondangwa East were reached.

The research sample was drawn according to the three levels of curriculum decision-making. The first is the **Macro level**. (See Chapter 1, p: 14). At this level the Education Officer responsible for EE was selected for the interview. The Education Officer is an employee of the MBESC who is based at NIED. Moreover, an EE Consultant who was also based at NIED was interviewed. Finally, various documents, syllabuses and books that pertain to EE were also given to the researcher for analysis and examination. The aim of interviewing these experts was to get qualitative information on ideas and efforts made to incorporate EE into the school curriculum. Efforts made to train teachers and overcome all the other barriers that EE teachers face in the school curriculum were also explored at this level. (See Appendix 1,subsection A).

The second level of curriculum decision-making is the **Meso level** (see Chapter 1, p: 14). In this respect school principals or senior members of staff were asked to fill in a questionnaire tailored for them. The aim was to explore how the planning at school level incorporated EE into the curriculum. The structures that facilitate the incorporation of EE into the curriculum were also explored. The school management's knowledge of environmental problems as well as action taken at school level to address these problems was also assessed at this level. Of the 10 schools selected for the study, only 8 principals returned the questionnaire. One of the principals preferred to be interviewed and the researcher collected the results by filling them in on the questionnaire. (See Appendix 1, subsection B).

The third level of curriculum decision-making is the **Micro level** (see Chapter 1, p: 14). In this respect teachers and learners were interviewed. A total of 67 teachers, teaching various subjects, were interviewed. Only one teacher per subject specialisation taught at school was interviewed per school. The selection of the teachers was random. If there

were three teachers at school teaching a similar subject, then one of them would be asked to respond by completing the questionnaire. Various teachers chosen to respond to the questionnaire by the school principals were interviewed. The aim of interviewing teachers was to explore their knowledge about EE, concept of cross-curricula teaching as well as whether they had incorporated EE into their subjects. The researcher also examined how they had incorporated three EE elements. Teacher creativity or their ability to find and use resources for themselves was also assessed. (See Appendix 1, subsection C)

The last groups of respondents researched at the micro level were the learners themselves. In this case the sample was restricted to 121 learners in the senior grades (grade 10 -12). The learners in these grades were selected because they represented the structure of the secondary school, i.e. Grades 10's represented the JSP while the Grade 11 and 12's represented the Senior Secondary Phase. Furthermore, the researcher felt that the learners in these grades are more mature and could reflect the reality of learners experience and understanding about the environment. Stage sampling was applied. This sampling technique entails that three stages are followed when selecting learners for the interview. In this regard schools were firstly selected for the study. These schools were Centaurus, Rundu, Ngweze, De Dune, Walvis Bay, Maria Muengere, Oshigambo, Cornelius Goreseb Kizito and Cosmos high schools. Secondly, grades were selected. In this case only grades 10, 11 and 12 were eligible for the study. Lastly classes from such grades were selected. Care was taken to ensure that where there was more than one class per grade, a sample of one or two learners from each class was selected. The aim of interviewing learners was to assess their knowledge of the environment and related actions as well their experience about the environment both outside and inside the classroom. (See Appendix 1, subsection D)

3.3 Methods of data collection

The period of data collection started on the 3rd April 2001 in Windhoek region. From the 8th May to the 1st June 2001, data was collected in the regions of Rundu, Caprivi,

Ondangwa East and Erongo. Finally, data was collected from Keetmanshoop region from the 2nd June to the 30th June 2001.

In order to ensure that adequate and valid data was collected, the researcher used a variety of methods of data collection. This is known as Tri-angulation. According to Mertens (1998:183) "tri-angulation involves checking information that has been collected from different sources or methods for consistency of evidence across sources of data". In the light of this, three methods of data collection were used. These are questionnaire, interview and document review methods. The main method of data collection was the questionnaire. The questionnaire (see Appendix 1) has four subsections for the different levels. The main method was preferred because it offered several advantages to the researcher. One advantage was that with Namibia being a vast country and hence the target population widely spread, the researcher could not reach the research participants due to time limitation but questionnaires could be mailed to the contact persons who then monitored their distribution to selected respondents. This meant that a large group of respondents were reached in the shortest time possible. The response pattern was good since no problems were reported from those who helped to deliver the questionnaire. Another reason why the method was preferred was because it offered the respondents time to think and reflect on their experiences. Some residents took the questionnaires home and as a result had enough time to record accurate responses. Finally, this method was preferred because it could easily be supplemented through direct observation and interviews.

3.4 Analysis of data

When data collection was complete after the 30th of June 2001, the Special Package for Social Sciences (SPSS) programme was utilised to enter information for the data analysis. A total of 196 questionnaires were analysed using the above-mentioned programme. Each questionnaire from principals, teachers and learners were entered.

The responses for ministerial level respondents were not entered into the SPSS because of the limited number of variables involved. The views of the two respondents in this regard were only entered into the relevant section (see Chapter 4, p: 39-41).

The questionnaires coding of responses preceded the data entering process. In the process of coding, responses were given codes in the form of numbers ranging from 1 to 7 or even more depending on the number of different or similar responses per question. This entails that all similar responses was grouped under one code. For example, Yes or No questions were given numbers of 1 and 2 so those who responded Yes to a question were all put under 1 while all those who responded No to a question were grouped under 2. This indicated at the end of the day the frequency of a particular code. In some open ended questions a similar process of coding was followed. This means that similar or nearby similar responses given by different respondents were put into a similar code.

3.5 Evaluation of methods of data collection

Three methods of data collection were used (refer to Section 3.3, p: 34 -35). The decision to use three methods of data collection proved fruitful because the methods complimented one another in the sense that the other information that could not be adequately covered by one method, could be by another.

However, the researcher is of the opinion that there were positive factors and negative factors that influenced the outcome of this study due to responses to the methods of data collection. The positive factors were that the researcher is well known by many teachers and principals of schools countrywide. Many teachers and school principals who were approached were willing to help and render their support to the realisation of the aim of the research. School principals assigned a senior member of staff who assisted the researcher to monitor the distribution and collection of the questionnaires. The interest shown by school principals and willingness of teachers to respond to the questionnaire is a positive factor that added to the realisation of the aims and outcomes of this study.

It is also important to mention that the learners' responses were overwhelming because many of them showed great interest in filling in their views on the questionnaire. They regarded the research questionnaire as an opportunity to express views about their love and concern for the environment, calling upon relevant authorities at schools to help in improving environmental actions.

The negative factor revolved around the position of the researcher, which was misinterpreted by some teachers and school authorities. Since the University of Namibia employs the researcher, some teachers and school principals assumed that the researcher was conducting an inspection aimed at finding out whether they were doing things the right way. As a result of this some of the teachers and school principals falsely indicated that they had EE structures that do not really exist in their schools. Another negative development is that most of those teachers who were willing to be interviewed were those who regarded themselves as teachers of environmental subjects. Those teachers who felt that their subjects had nothing to do with the environment did not show much interest and only a few of them returned the questionnaire. Of the few that were interviewed, they generally indicated that I should not have interviewed them arguing that their subjects were not environmental.

It was the view of the researcher that an equal number of learners in grade 10, 11 and 12 be interviewed, however the researcher found that some school authorities preferred to give more questionnaires to their grade 12 learners. The school authorities preferred choosing the best among their learners hence statistics in Figure 19, p: 63, show that there were more grade 12 learners interviewed than from the other grades.

3.6 Conclusion

Despite the problems stated above, results were generally representative of the overall situation in the educational institution studied. This was done through convincing the authorities, learners and teachers that the research was not an inspection but an academic engagement meant to find out how EE had been incorporated into the secondary school

curriculum so that constructive recommendations for improvement could be made. The researcher also stressed that the views of the respondents would be treated with utmost confidentiality and anonymity and no efforts would be made to link comments with a particular individual respondent. Since there were numerous respondents who wanted to see the results of the research, the researcher made it crystal clear that the result of research would be made available in the National Library after approval of the dissertation and on permission of the relevant authorities at the University of South Africa. Negative factors that resided around the provision of incorrect information was counteracted through observation or periodic face to face and telephonic interviews in order to confirm the existence of such structures at schools and ensure validity of data.

Chapter 4: The research results and findings

4.1 Introduction

Chapter 3 outlined the theoretical and practical aspects of the process of investigation used in this study. This chapter shows the results of the investigation. These will indicate whether and to what extent EE is incorporated into the Namibian secondary school curriculum. The conclusions, recommendations, hypotheses tested and implications for further research made in Chapter 5 are based on the results of the research shown in this chapter.

This chapter is divided into three sections according to the sampling order explained in Chapter 3, p: 33. The first section represents views from the **Macro level respondents**. Responses from respondents at ministerial level or macro level are qualitatively exposed and explained. The second section represents views from the **Meso level respondents** whereby views and opinions of the management members of the schools are expressed in quantitative terms. The last section is the **Micro level**. In this section, responses from teachers and learners are quantitatively exposed.

There are 10 tables shown in this chapter with 6 columns. The **fourth** column **(percentage of total)** has been used in interpreting the results of this research.

4.2 The discussion of results

4.2.1 The results of research from MACRO level respondents

In Question 1, Subsection A (Appendix 1) the researcher wanted to find out whether EE is part of the broad curriculum for secondary schools in Namibia. The response to the question revealed that EE is part of the broad curriculum (see Chapter 2).

In Question 2, the researcher wanted to find out which subjects were used to support EE in the Namibian broad curriculum for secondary schools. The response to this question revealed that subjects that were used to support EE in the JSP broad curriculum were Life

science, and Geography while in the Senior Secondary Phase (H/ IGCSE) broad curriculum), there were subjects such as Natural economy, Geography, Biology, Development studies, Agriculture science, Health education and Social studies. The analysis of IGCSE English textbook revealed that the English language also covers some concepts that relate to EE. These results show that not all subjects are used to support EE in the broad curriculum for secondary schools in Namibia.

Question 3 asked about the model whereby a variety of subjects are used to address EE. This model is known as the integrated model. This means that EE is not regarded as a separate subject on its own but a subject to be incorporated into other disciplines or subjects. It is not EE alone that is regarded as a cross-curricular subject; there are other cross-curricular subjects that are intertwined into the subjects in the broad curriculum for secondary schools in Namibia (refer to Chapter 2, p: 27).

In Question 4, the researcher wanted to find out about the presence of a National EE Policy. The response to this question revealed that there is one but it is not yet fully implemented. This policy was developed by NEEN (refer to Chapter 2, p: 20).

Question 5 is about teacher training in EE. The researcher wanted to find out whether there have been efforts to train teachers in EE. The response to this question revealed that there were limited opportunities for teacher training in EE within the Namibian teacher education system. Although there had been efforts to train teachers, this had been limited in scope and in some cases done on an ad hoc basis while in other cases incorporated into the curriculum for BETD (refer to Chapter 2, p: 22). Furthermore, teachers for the Senior Secondary Phase had had very little training in EE. This could be a problem for EE as the extent to which EE can be incorporated effectively depends on the knowledge and skills of all teachers.

In Question 6, the researcher wanted to find out whether there were guidelines for incorporating knowledge, values and attitudes as well as environmental actions in the curriculum. The response revealed that EE in Namibia is built more on knowledge

dimensions with very little integration of action learning. Values and attitudes were not integrated into the curriculum of the school system. There appeared to be no guidelines for the integration of values and attitudes into the curriculum for secondary schools in Namibia. Teachers had not been trained to deal with values education in general.

The researcher regards the incorporation of environmental days through which learners can learn about the environment as important. He wanted to find out whether there had been attempts made to incorporate or link them to the national curriculum. The response to Question 7 revealed some National environmental days were celebrated through art competitions, essay writing or clean up campaigns. Furthermore, schools were free to plan a number of activities ranging from tree planting and cleaning up campaigns to creative writing and artwork. This shows that the MBESC regarded environmental days as essential and therefore urged schools to plan activities on these days.

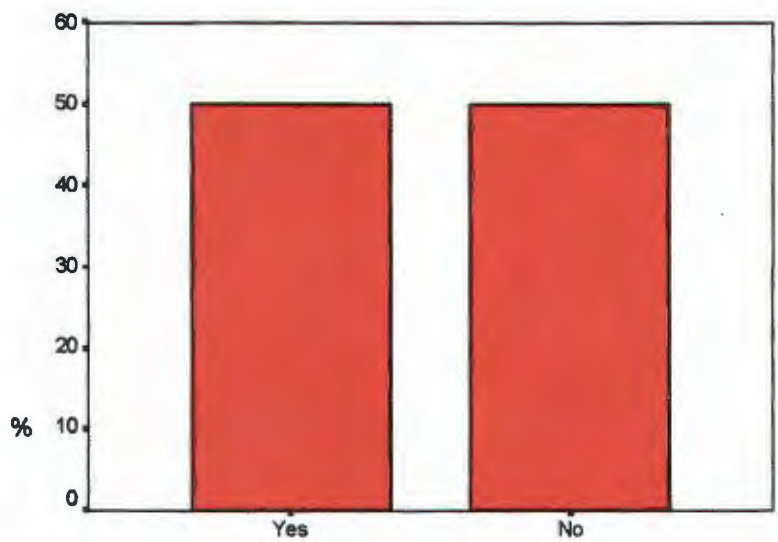
Question 8 was the last question in this Subsection. The question was about EE coordinators in the Namibian staff establishment, the response to the question indicated that EE coordinators were based at the Directorate of Adult Basic Education (DABE); the National Institute of Educational Development (NIED) and at the Ministry of Environment and Tourism (MET). At school level there were no EE coordinators appointed by the ministry. Schools were urged to appoint an EE coordinator but education authorities did not fund them. Their duties were performed as part of their teaching activities. Although various agencies had EE coordinators, not all schools had coordinators (see Figure 5, p: 44). Such schools should also be encouraged to appoint their own.

4.2.2 The results of research from MESO level respondents

At the Meso level, principals of school were requested to respond to questions. In Question 1, Subsection B (Appendix 1) principals were asked to identify their school. This question was only an opening question. 8 of the total 10 schools selected for the study returned their questionnaires. (See Chapter 3, p: 34). Principals of Kizito and Cosmos high schools did not return their questionnaires.

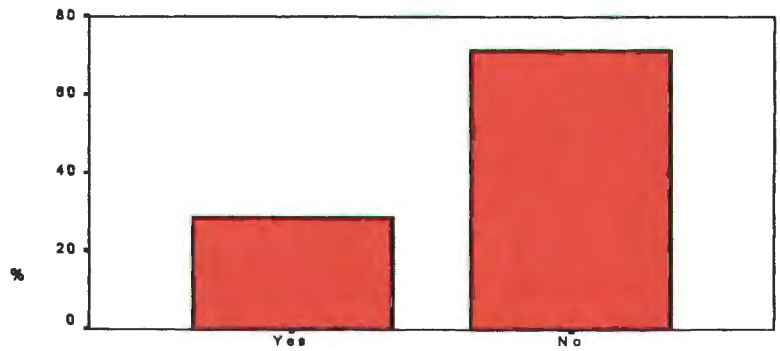
Question 2 was a key question as it laid the foundations for cross-curricular teaching. The question was aimed at finding out whether teachers from various school departments planned together when preparing for cross-curricular work. The results are shown in Figure 2, p: 42. The results show that 50% of principals said they had done so while 50% said that there had been no such activity at their schools. Since half of the schools said that their teachers did not sit together when planning for their teaching, this implies that planning of teachers at a interdepartmental level is not the norm among the schools in Namibia.

Figure 2: Bar graph that shows whether teachers at school planned together when preparing for cross-curricular work



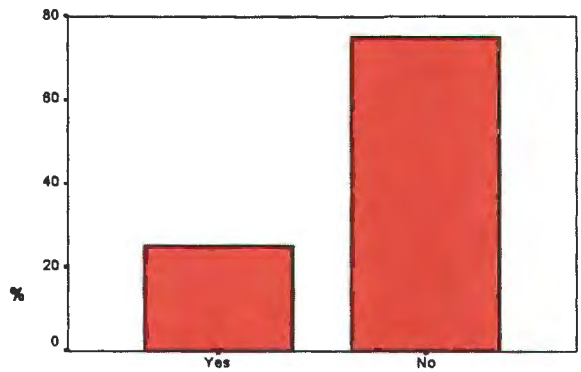
In Question 3, the researcher wanted to find out whether all members of the school management were involved in the supervision of cross-curricular work for teaching purposes. The results in Figure 3, p: 43, indicate that 25% of the principals had made efforts to involve all management members in this process while about 62.5% responded that they had not done so. About 12.5% of the School management did not respond to the question. This could cause problems because cross-curricular work in EE needs the support and supervision of all members of management (see Chapter 5, p: 75-76).

Figure 3: Bar graph that shows whether members of school management were involved in the supervision of cross-curricular work



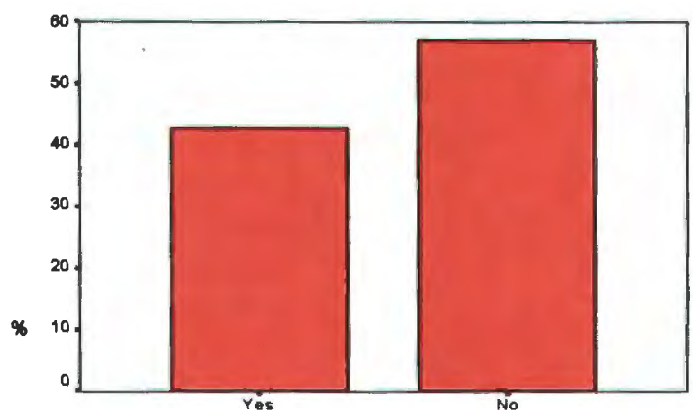
The researcher supports the involvement of learners in the process of planning for teaching and learning (see Chapter 1, p: 7). In Question 4, principals were asked whether learners at their schools participated in the planning for teaching and learning purpose. The results in Figure 4, p: 43, show that 22% of the respondents involved learners in planning process while 78% responded that they did not do so. This means that the majority of schools interviewed did not involve the learners in the planning process. In EE learner centred education is essential and the involvement of learners in the planning of education activities for teaching and learning purposes is one way in which it could be realised.

Figure 4: Bar graph that shows whether learners had been involved in planning for cross-curricular work



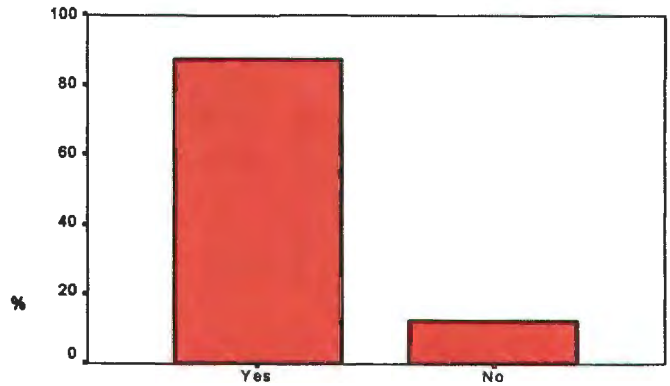
Question 5 was a key question because the presence of these coordinators helps in carrying EE (see Chapter 5, p: 75-76). The researcher wanted to find out about the presence of EE coordinators in the school system in Namibia. The response to the question is shown in Figure 5, p: 44. Here the results indicate that not all schools had EE coordinators, 43% said that they had an EE coordinator while 57% said they had no EE coordinator. The fact that EE coordinators were not universal in all schools could be a problem in the incorporation of EE in Namibia. EE coordinators help in the delivery of the discipline at school.

Figure 5: Bar graph that shows the availability of EE coordinators in the Namibian schools



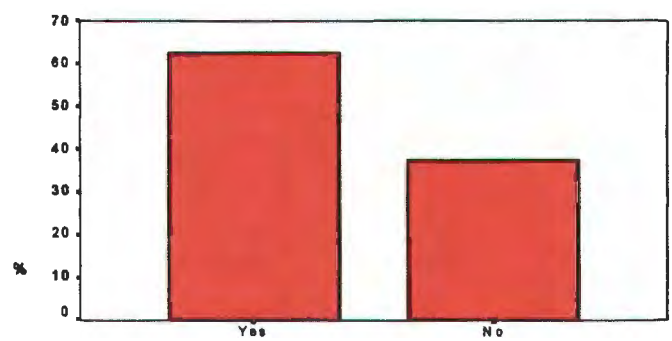
Question 6 was about school policies. Most schools in Namibia do not have policies that specifically support EE but are of general nature. Such policies may have sections that could support EE. Figure 6, p: 45, shows that 87.5% of schools interviewed had policies while 12.5% indicated that they did not. EE policies are essential because they reflect the school's commitment to the protection of the environment and provision of quality EE to learners. If they are non-existent, they may not attract potential learners and the school's commitment to education and quality EE may remain in doubt.

Figure 6: Bar graph that shows whether schools had policies



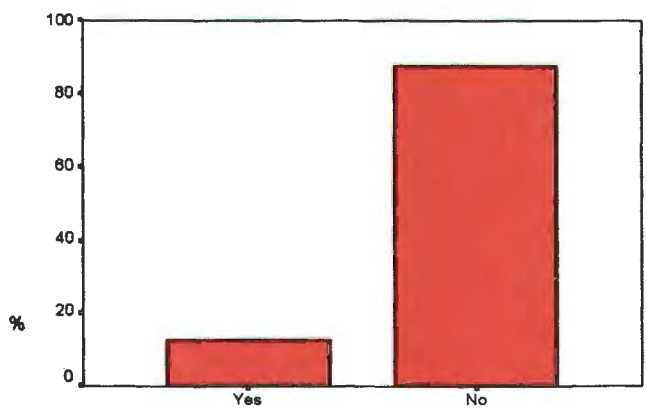
Question 7 was the most important question in this regard because it indicates whether such policies supported EE. The results in Figure 7, p: 45, reveal that 37.5 % of schools policies did not have anything to do with EE while 62.5% indicated that their policies had elements that supported EE at school. Support of EE learning came in the form of clean up operations, general body cleanliness and avoiding litter at school and at home. Although a small number of schools indicated that their policies did not support EE, this is a cause of concern in the incorporation of EE in secondary schools in Namibia. All schools need to have a programme that supports EE if they want to maintain efficient use of resources and quality education.

Figure 7: Bar graph that shows whether school policies supported EE



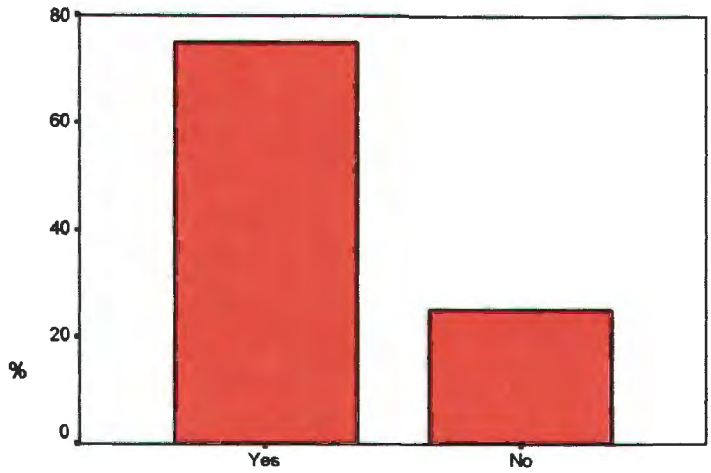
The researcher supports the view that learners need to be involved in the writing of policies especially if it pertains to EE. This is essential because learners learn from being involved in policy writing and development. In Question 8 principals were asked whether learners at their schools participated in the writing of school policies. The response in Figure 8, p: 46, reveals that only 12,5% of the schools indicated that learners were involved in the writing of the school policies for EE while 87.5% said that learners were not part of the school policy development. This shows that the majority of learners were recipients of policies drawn up by the school authorities.

Figure 8: Bar graph that shows whether learners were involved in the writing of school policies for EE



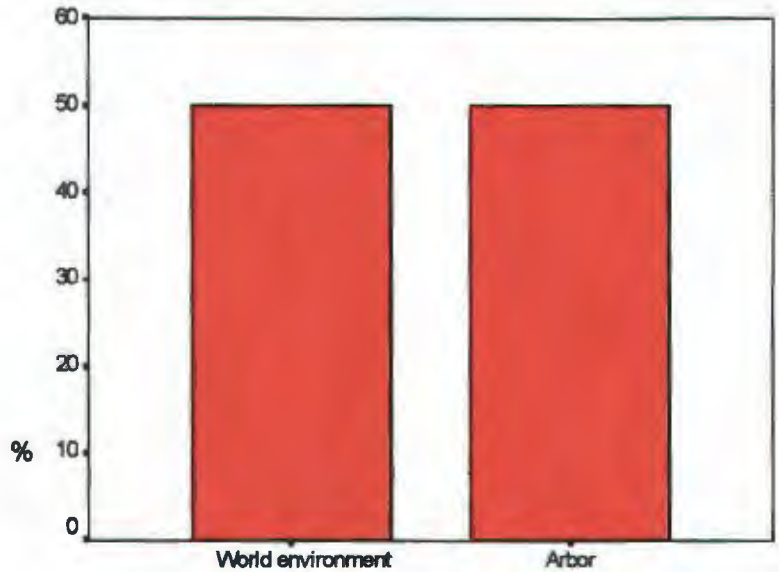
In Question 9, the researcher wanted to find out whether school authorities allowed learners to participate in environmental competitions or science expos. The environmental competitions could provide valuable learning experiences for learners. The response in Figure 9, p: 47, reveals that about 78% of schools had allowed their school learners to participate in environmental competitions whilst 22% of respondents said that they had not allowed learners to participate in science expos or environmental competitions. This means that not all school learners experienced EE through competitions.

Figure 9: Bar graph that shows whether schools allowed learners to participate in science expos or environmental competitions



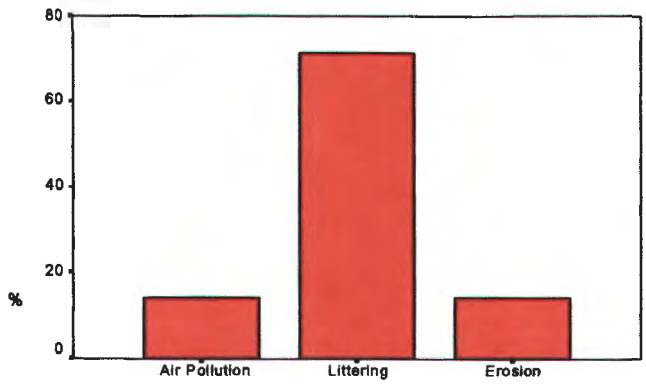
The researcher indicated that environmental days are important in EE for encouraging actions. Through Question 10 the researcher wanted to find out whether schools participated in environmental days annually. The response in Figure 10, p: 48, reveals that 50% of schools interviewed participated in the World Environment Day while other 50% of schools participated in the World Arbor Day. (Refer to Section 4.2.1, p: 41, for type of activities planned on these days). In general these results indicate that not all schools in Namibia celebrated environmental days and that the days that were celebrated are not adequate. Celebration of environmental days is important because most actions meant to solve environmental problems could be taken on these days, hence learners may benefit substantially.

Figure 10: Bar graph that shows environmental days in which schools participated



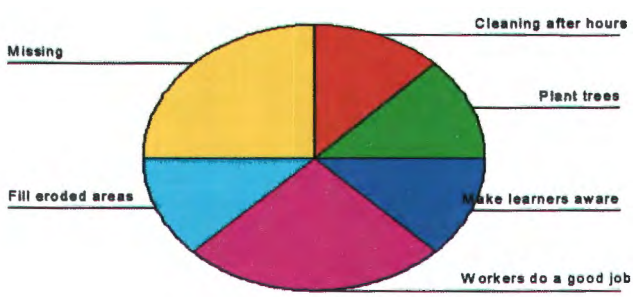
In question 11, principals or other senior members of management were asked about the environmental problems that they face. The aim of the question was to find out the level of environmental knowledge and understanding of principals of environmental problems. The results in Figure 11, p: 49, reveal that littering at 75% was the most common problem, followed by air pollution and soil erosion, which stands at 12.5% each. This shows that principals in most schools had a partial knowledge and understanding of environmental problems affecting them. Any training and education programme in EE may build on this existing knowledge.

Figure 11: Bar graph that shows environmental problems faced by schools in Namibia



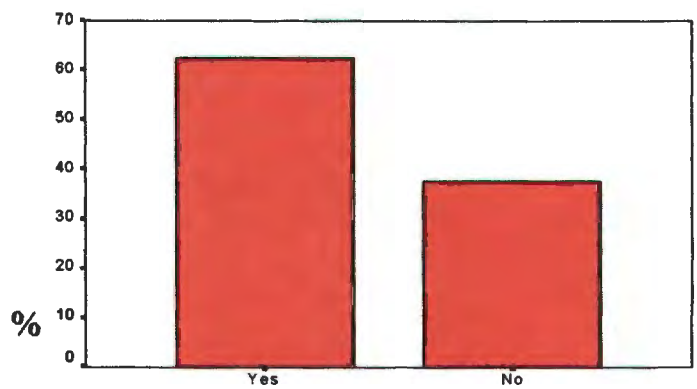
In Question 12, the researcher wanted to find out the actions taken by school authorities to solve problems in Question 11.The response revealed in Figure 12, p: 49, shows that 12.5 % of the schools did cleaning after school, made learners aware of the importance of recycling only and planted trees. About 37.5% of the schools indicated that their workers did a good job, which means that they relied on cleaners whilst 25% of the respondents did not respond to the question. Although this is an indication of actions in EE, these were not present in all schools in Namibia.

Figure 12: Pie chart that shows what schools did to solve environmental problems



Field work is an important instructional technique in EE (see Chapter 5, p: 81). In Question 13, the researcher wanted to find out whether this was part of the school instructional strategies. Figure 13, p: 50, show that 62.5% of the schools indicated that field work was part of their instructional strategies whilst 37.5% of the respondents said that this was not the case. Although the majority of schools indicated that they used field trips as part of instruction in EE, there is a need for improvement in the use of this instructional technique. All learners and all schools should experience it.

Figure 13: Bar graph that shows whether school learners went on field trips



In Questions 14 and 15, the researcher wanted to find out about EE clubs and EE magazines. These are essential because they would enable learners to explore their feelings, views and opinions about the local environment and in this way enrich their experiences. The researcher wanted to find out about the existence of these structures as possible facilities that would support the learning of EE at schools. The results in Figure 14, p: 51, shows that environmental clubs were part of about 37.5% of the schools while 62.5% of the schools did not have EE clubs. School EE magazines were non-existent in all schools that completed the questionnaire (refer to Figure 15, p: 51). The results in this case illustrate that in most of Namibia, there was a significant lack of structures that would facilitate the incorporation or learning of EE. These facilities are essential because they could help learners reflect on the experience and in this way learn a lot about the environment.

Figure 14: Bar graph that shows the availability of EE clubs in schools in Namibia

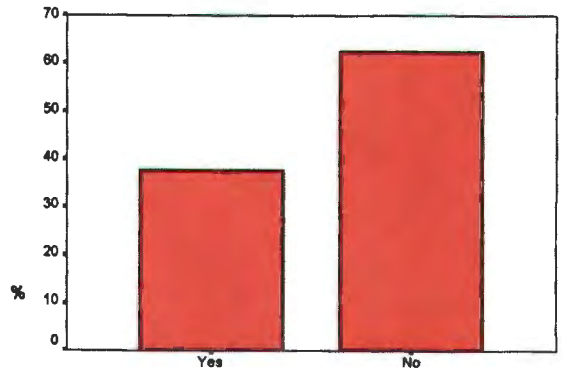
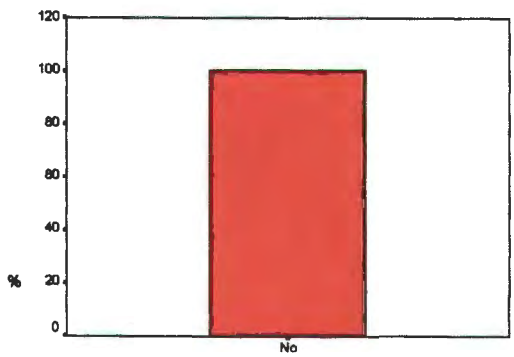
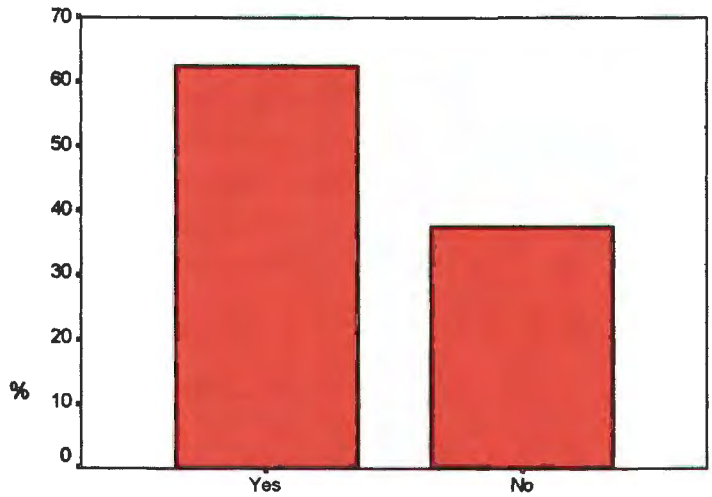


Figure 15: Bar graph that shows the presence of EE magazines in schools in Namibia



Question 16 was the final question in this Subsection. The question was posed to find out whether those schools that did not have EE magazines would be interested in setting up their own EE magazine. The establishment of EE magazines allows learners at school to write their perceptions, experience and feelings about their immediate environment and in this way learn environmental concepts and actions. The results in Figure 16, p: 52, reveal that 62.5% of the schools would be interested in setting up their own EE magazine while 37.5% of the schools showed no interest in setting up such a facility at their schools. Although the majority of schools interviewed said that they would be interested in setting up such a facility there were some who resisted the creation of a vehicle that could facilitate the incorporation of EE at schools in Namibia.

Figure 16: Bar graph that indicates whether schools would be interested in setting up school EE magazines



4.2.3 The results of research from MICRO level respondents

In this section there were two categories of respondents. The first category was teachers who completed the questionnaire. The second category represented learners.

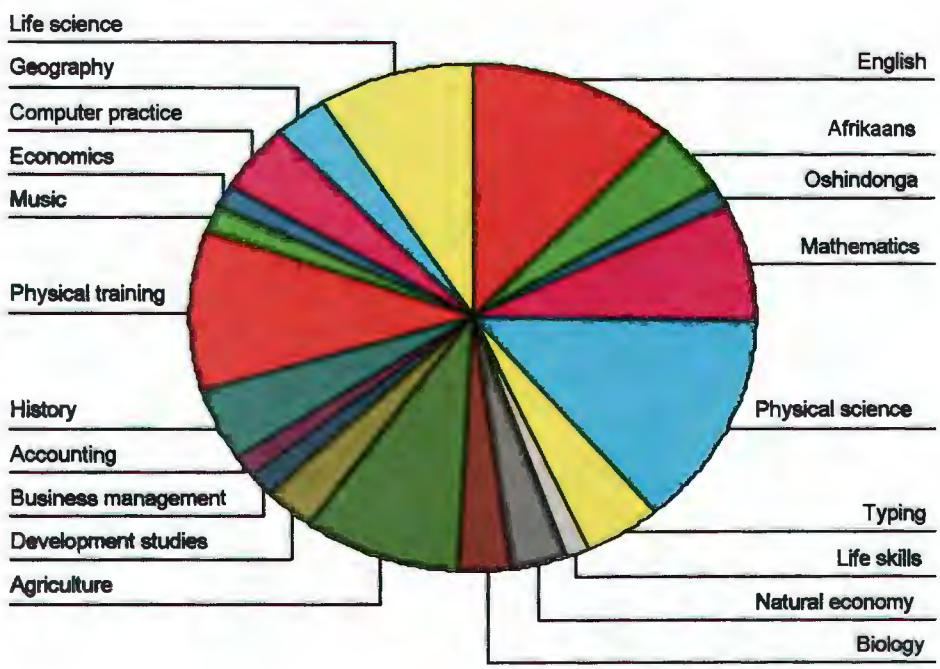
4.2.3.1 Teachers' responses

In the section below, teachers' responses to the questionnaire are shown. Teachers are primary agents in the incorporation of EE, their views in this process are important.

Question 1, subsection C (Appendix 1) was an opening question aimed at finding out the subjects taught by teachers who completed the questionnaire. Figure 17, p: 53 is a pie chart that shows the subject teachers who were interviewed. The results indicate subjects such as English, Afrikaans, Oshindonga, Mathematics, Physical science, Typing, Life skills, Natural economy, Biology, Agriculture science, Development studies, Business studies, Accounting, history, Physical Education, Music, Economics, Computer practice, Life science, were taught by teachers. The majority of teachers interviewed represented the Physical science teachers who stand at 16.4%, followed by the English language

teachers standing at 11.9%. Physical education teachers accounted for 10.4%, Agriculture science teachers, Mathematics, Typing and Geography teachers accounted for 7% each. The least numbers of teachers interviewed had been observed in the subjects such as Computer practice, Economics, Home economics, music and Business studies; they stand at 1.5% to 2% of the total teachers interviewed. The statistics show that the majority of teachers who were interviewed were those ones whose subjects were traditionally environmental.

Figure 17: Pie chart that shows subject teachers who were interviewed



In Question 2, teachers of these subjects were asked whether they had incorporated environmental issues into the teaching plans. The results showed few exceptions such as Mathematics, Accounting, Typing, R.M.E, Oshindonga and Life skills had not done so. They said that they had not incorporated environmental issues because their subjects did not have anything to do with EE. 61.2% said they had incorporated EE into their subjects while 34.3% said they did not incorporate EE into their subjects. About 4.5% of the teachers did not respond to the question. The majority of those teachers who said that

they incorporated EE into their subjects were those whose subjects were traditionally environmental .ie Geography, Life science, Agriculture science, Natural economy and Physical science. Generally, there was a small number of non- environmental teachers who had an idea of how their subjects could contribute to EE (see Table 8, p: 59). This holds positive implications for EE in Namibia because a teacher education programme could build on the existing numbers and increase the interest of some teachers in EE.

Question 3 was a key question that asked teachers' views of the concept of EE. The aim of the question was to find out about teachers' understanding of the concept of EE. This is essential because teachers need to understand the concept if they are to implement EE effectively. The result of Question 3 is shown in Table 4, p: 55. The result shows that 68.7% of the teachers said that EE was about providing environmental information and awareness to learners while 7.5% indicated that EE was education about the environment so that learners are competent to deal with it in a sustainable way whilst 6.0% of teachers regarded EE as education about the environment that relates to the whole curriculum. Another 6.0% argued that EE was a concept that a person studies. These definitions displayed a variety of interpretations that teachers attached to the concept of EE and show that teachers in Namibia have a partial understanding of the concept of EE. Since teachers did not show a complete understanding of what EE is all about they need to be trained in order to teach it effectively.

Table 4: Teachers' definitions of the concept of EE

		Number	percentage Of total	Valid percent	Cumulative percent
	1.Give learners environmental awareness, knowledge and protection about the environment	46	68.5	70.8	70.8
	2.Teaching environmental issues in the whole curriculum	4	6.0	6.2	77.0
	3.Study of physical and social conditions of life	1	1.5	1.5	78.5
	4.Study of Natural ecosystems and human role within them	3	4.5	4.6	83.1
	5.Education about the environment so that learners are competent to deal with it in a sustainable way	5	7.5	7.7	90.8
	6.A concept, which a person studies	4	6.0	6.2	96.9
	7.Teaching environmental concepts so that learners can move from environmental awareness to understanding and actions	2	3.0	3.0	100.0
Total		65	97.0	100.0	
Missing System		2	3.0		
Total		67	100.0		

Question 4 was a key question in which teachers were asked to give definitions of the concept of cross-curricular teaching. Understanding this concept is important because confusion may cause failures in implementing it. The results of this question are shown in Table 5, p: 56. 28.4% of the teachers believed that cross-curricular teaching was about combining or merging subject areas while 22.4% said that it was when content taught in one subject is used to help solve problems or help learners understand the content of another subject. 16.4% of teachers said that it was about teaching content referring to the total programme of the school. A significant proportion of teachers said it was about teaching extra curricular subjects while others maintained that it was teaching through the English medium. Other definitions given by teachers can be seen in the table below. These results show that confusion about the meaning of the concept of cross-curricular teaching still exists among Namibian teachers.

Table 5: Teachers' definitions of the concept of cross- curricular teaching

		Number	percentage Of total	Valid Percent	Cumulative Percent
	1.When subjects are combined or integrated	19	28.2	29.9	29.7
	2.It is teaching of an extracurricular subject	5	7.5	7.8	37.5
	3.When content taught in one subject is used to solve problems or help learners understand content of another subject	15	22.4	23.2	60.9
	4.Relates education to learners' past history	2	3.0	3.1	64.1
	5.The type of topic included in the curriculum	1	1.5	1.6	65.6
	6.Teaching two or more related subjects	1	1.5	1.6	67.2
	7.Caters for what is taught at school and at home	2	3.0	3.1	70.3
	8.Combines theory and practice in learner centered education	1	1.5	1.6	71.9
	9.Follows up from one grade to another	1	1.5	1.6	73.4
	10.Teaching through the English medium	4	6.0	6.3	79.7
	11.When teachers help each other on things they do not understand	1	1.5	1.6	81.3
	12.Teaching a content referring to the total programme of the school	11	16.4	17.2	98.4
	13.No answer	1	1.5	1.6	100.0
Total		64	95.5	100.0	
Missing System		3	4.5		
Total		67	100.0		

In Question 5, teachers were asked to list environmental problems that they faced at school. This question was meant to test the teachers' knowledge and understanding of environmental problems. The response to the question is shown in Table 6, p: 57. The most common environmental problem was littering, followed by deforestation, water wastage, air pollution and sand dunes. About 7.5% of the teachers said that there were no environmental problems within their schools. 1.5% of teachers did not respond to the

question. These results show that some teachers in Namibia have a good knowledge of environmental problems within their school and country.

Table 6: Teachers' list of environmental problems

		Number	percentage of total	Valid Percent	Cumulative Percent
	1.Littering	31	44.5	45.5	45.5
	2.Deforestation	4	6.0	6.1	53.1
	3.Soil Erosion	2	3.0	3.0	56.1
	4.Water wastage	6	9.0	9.1	65.2
	5.Blocked Sewage	2	3.0	3.0	68.2
	6.Air pollution	4	6.0	6.1	74.3
	7.overgrazing	1	1.5	1.5	75.8
	8.Snakes	1	1.5	1.5	77.3
	9.Factory Emissions	1	1.5	1.5	80.3
	10.Mosquitoes	1	1.5	1.5	81.8
	11.Harsh Weather Conditions	1	1.5	1.5	83.3
	12.Vandalism	1	1.5	1.5	84.8
	13.Noise Pollution	2	3.0	3.0	86.3
	14.Sand dunes	4	6.0	6.1	92.4
	15.None	5	7.5	7.1	100
Total		66	98.5	100	
Missing system		1	1.5		
Total		67	100		

In Question 6, teachers were asked to state the actions they took to solve the environmental problems they identified. The results to this question are shown in Table 7, p: 58. These actions included advice and education, arranging clean up days, closing taps, filling gullies, posters, catching snakes, electing a support committee, writing a letter to authorities, using dustbins, fencing the school. Additionally, 19.4% of teachers said that they did nothing whilst 3.0% did not respond to this question. Although some teachers suggested actions, there is still confusion about real actions taken to solve environmental problems. Some teachers suggested theoretical ideas as actions taken. Others seemed to have taken actions meant to solve environmental problems. This shows that actions in EE were not universally applied.

Table 7: Teachers' actions taken to solve environmental problems

		Number	percentage Of total	Valid percent	Cumulative percent
	1.Advice and education	11	16.4	16.9	16.9
	2.Cleaning day	22	32.8	33.8	50.7
	3.Not to leave taps open	4	6.0	6.2	56.9
	4.Fill gullies	1	1.5	1.5	58.4
	5.Posters	1	1.5	1.5	59.9
	6.Catch Snakes	1	1.5	1.5	61.4
	6.Elect a support committee	1	1.5	1.5	62.9
	7.Write a letter to authorities	2	3.0	3.2	66.1
	8.Dust bin	7	10.4	10.9	77
	9.Fence the school	1	1.5	1.5	78.5
	10.Nothing	13	19.4	21.5	80.0
Total		64	95.5	100.0	100.0
Missing system		3	4.5		
Total		67	100		

In question 7, teachers were asked to show how they had incorporated EE elements into their subjects. The aim of asking such a question was to compel teachers to give one example of how they had incorporated EE within their subjects. The results of this question are shown in Table 8, p: 59. In this case a variety of interpretations had been given. Most teachers whose subjects were traditionally environmental indicated that their subject was environment oriented. Language teachers used discussions, assignments and environmental literature. Three economics teachers pointed out how exploitation of environment could deprive a country of trade and development. Mathematics, Accounting and Typing teachers indicated that there was nothing environmental in their subject content. Other examples are shown in the table. These results show that there are some teachers who knew how their subjects could contribute to EE whilst others did not. Such teachers could resist the incorporation of EE into their subjects.

Table 8: How subject teachers incorporated EE into their subjects

		Number	percentage Of total	Valid percent	Cumulative percent
	1. In **Development Studies** we emphasise that if incorrect methods are applied then the environment is damaged	1	1.5	1.9	1.9
	2.**Biology as** the whole relate to the environment.	5	7.5	9.3	11.2
	3.In **Physical Science** everything is about the Environment	5	7.5	9.3	20.5
	4.**Life Science** as a whole is about the environment.	2	3.0	3.7	29.8
	6.In **Economics** we point out how exploitation of resources can deprive the country's trade and development.	3	4.5	5.6	35.4
	7.In **History** we emphasise that during war pollution should be prevented	6	9.0	11.1	46.5
	8.In **English** we use environmental discussions and research assignments	7	10.4	13.0	59.5
	9. In **Accounting we** do not have a topic that deals with the environment	4	6.0	7.4	66.9
	10.In **Afrikaans** we use environmental literature	2	3.0	3.7	70.6
	11.In **Computer Practice** we discuss application and implication of computers	1	1.5	1.9	72.5
	12. In **Geography** All concepts relate to the environment	7	10.4	13.0	85.5
	13.In **Natural Economy** Environmental issues are part of the syllabus	5	7.5	9.3	92.6
	14. In **Business Studies** we draw a cost and benefit analysis of the impact of business on the environment	1	1.5	1.9	94.8
	15. In **Mathematics** there is nothing that pertains to the environment	2	3.0	2.7	97.5
	26. In **Typing** there is nothing pertaining to the environment	2	3.0	2.7	100
Total		53	79.3	100	
Missing System		14	20.7		
Total		67	100		

In question 8, the researcher wanted to find out about additional materials that teachers used to address environmental issues in the curriculum. The main aim of this question was to find out whether teachers in Namibia have the ability to find and use instructional materials. The results of this question are shown in Table 9, p: 60. In this case the majority of the teachers showed that they used magazines, others said that they had not utilised anything other than the textbook prescribed for the subject whilst 25.4% teachers did not respond to the question. In general teachers in Namibia show much creativity in their ability to find materials other than the textbook.

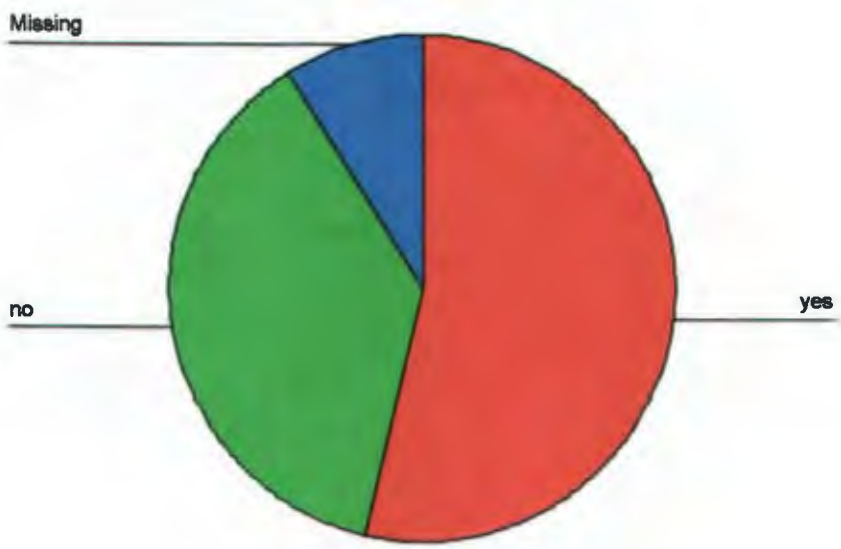
Table 9: Teachers' additional materials used to support EE

		Number	percentage of total	Valid percent	Cumulative percent
	1.Rubbish and waste	4	6.0	8.0	8.0
	2.Insecticide	1	1.5	2.0	10.0
	3.Text Book	4	6.0	8.0	18.0
	4.Posters	6	9.0	12.0	30.0
	5.Photographs/ maps	4	6.0	8.0	38.0
	6.Magazines/ newspaper	7	10.3	14.0	52.0
	7.Overhead Projectors	3	4.5	6.0	58.0
	8.Essays	1	1.5	2.0	60.0
	9.Graphs or charts	4	6.0	8.0	68.0
	10.Radio, and Video	4	6.0	8.0	76.0
	11.Examples	7	10.4	14.0	90.0
	12.None	5	7.2	10.0	100.0
Total		50	74.6	100.	
Missing System		17	25.4		
Total		67	100		

In Question 9, the researcher asked teachers whether they had included environmental aspects in examinations or tests they had set. This is essential because dedication to EE could depend on examination requirements. The results of this question are shown in Figure 18, p: 61. In this regard 53.7% of the teachers indicated that they had included EE questions in tests and exams, 37.3% indicated that they had not done so whilst 9.0% did not respond to the question. Although the majority of teachers had included EE questions in tests set by them, the others had not done so. This is a source of concern because EE is

the responsibility of all teachers at school and if not included in examination papers it could be regarded as less important (see Ledger in Ballantyne & Oelofse, 1989).

Figure 18: Pie chart that shows whether teachers had included EE questions in tests and examinations



Question 10 was the final question in this Subsection. The researcher asked teachers to write anything that related to EE. Their responses in this regard are shown in Table 10, p: 62. The majority of teachers preferred not to write anything. However of those who did, most showed appreciation of the environment as a resource. Others wanted support for the teaching of EE in a cross curricular manner and also called for more training and guidance on EE whilst 1.5% of teachers said that the researcher should not have interviewed them. In general these results indicate that some teachers still resist the incorporation of EE into their subjects while others show that they are positive.

Table 10: Teachers' general remarks about EE

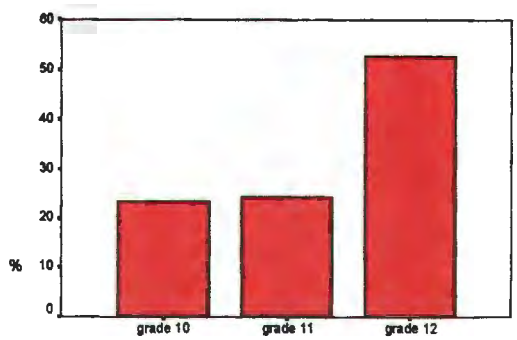
		Number	percentage Of total	Valid percent	Cumulative percent
	1.We should show appreciation of this valued resource	10	14.9	16.7	16.7
	2.More support, projects about EE	6	9.0	10.0	26.7
	3.More understanding and Training on EE	7	10.4	11.6	38.3
	4.Include more EE topics in Subjects where there are EE concepts	2	3.0	3.3	41.6
	5.We would like to see results of this research	2	3.0	3.3	44.9
	6.You should have targeted those teachers who deal with the environment	1	1.5	1.7	46.6
	7.A cross-curricular approach is the best way to teach EE	1	1.5	1.7	48.3
	8.No answer	31	46.3	51.7	100.0
Total		60	89.6	100.0	
Missing system		7	10.4		
Total		67	100		

4.2.3.2 Learners' responses.

The second group of respondents at micro level were learners. Their responses are discussed below.

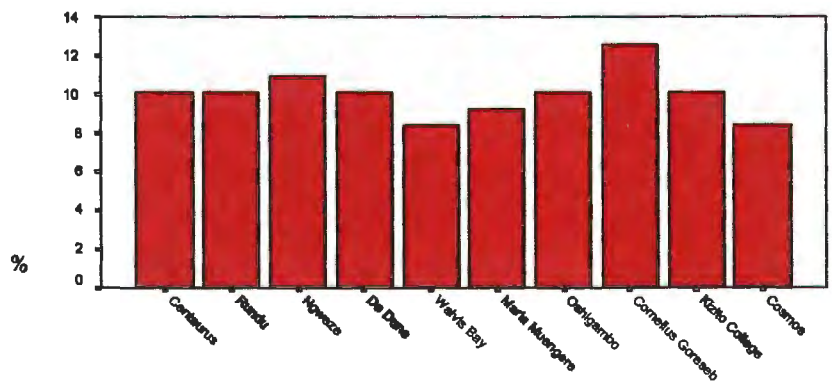
Question 1 in Subsection D was an opening question and represented the grades of learners who filled in the questionnaire. Statistics are shown in Figure 19, p: 63. The statistics show 52.5% of the learners interviewed were in grade 12 with grade 10 and 11 showing a percentage of 23.3% and 24.2 % respectively. The reason for this was explained in Chapter 3, p: 37.

Figure 19: Bar graph that shows learners who were interviewed per grade



Question 2 was also an opening question that indicates learners who were interviewed per school. The graph in Figure 20, p: 63 show the percentage of learners per school who were interviewed. Most learners were from Cornelius Goreseb followed by Ngweze high school.

Figure 20: Bar graph that shows learners who were interviewed per school



Question 3 asked about learners' understanding of the concept of environment. The results of this question are shown in Table 11, p: 64. As can be seen in the table, the majority of learners indicated that the environment was a place where animals and people lived and interacted, 37.2% of the learners said that the environment was anything that

surrounded us or where we worked and 3.3 % of the learners did not respond to the question. In general, the answers show that learners understand the concept environment.

Table 11: Learners' definitions of the concept environment

		Number	percentage of total	Valid Percent	Cumulative percent
	1.where animals, people and plants live and interact.	54	44.6	46.2	46.2
	2 Anything that surrounds us or where we work.	45	37.2	38.5	84.7
	3.It is the vegetation around us including – Land.	4	3.3	3.4	88.1
	4 Where a Community and forest are committed together.	3	1.7	1.7	89.8
	5 Conditions affecting a person in life.	8	6.6	6.8	96.6
	6 No answer	4	3.3	3.4	100.0
Total		118	96.7	100.0	
Missing system		4	3.3		
Total		121	100.0		

Question 4 tested the learners' knowledge of the environmental problems that they face in the country. The results are shown in Table 12, p: 65. The most common environmental problem mentioned by most learners was littering (20.7%). As can be seen in the table, 15.7% of the learners identified air pollution while 14.0% identified water and sea pollution. Other environmental problems identified were dumping of toxic waste, fire burning, diseases, drug and alcohol abuse, noise pollution, global warming and land mines. Approximately 8% of the learners did not respond to the question. An analysis of the results shows that these environmental problems were based on learners experience as well as knowledge drawn from books. These results indicate that learners had a good knowledge of the environmental problems that they face in the country.

Table 12: Learners' list of environmental problems

		Number	percentage Of total	Valid Percent	Cumulative Percent
	1.Dumping of Toxic waste	1	.8	1.0	1.0
	2.Water and sea pollution	17	14.0	16.1	17.1
	3Littering	25	20.7	24.0	41.1
	3.Overcrowding	3	2.5	2.9	43
	4.Fire burning	1	.8	1.0	44.
	5.Deforestation	16	13.2	15.4	60.4
	6.Poverty	2	1.7	1.9	62.3
	7.Flood	2	1.7	1.9	64.2
	8.Drought	3	2.5	2.9	67.1
	9.Soil Erosion	6	5.0	5.8	72.9
	10.Air pollution	19	15.7	18.3	91.3
	11.Crime	2	1.7	1.9	93.1
	12.Disease	1	.8	1.0	94.1
	13.Drugs & alcohol	1	.8	1.0	95.1
	14.Noise & pollution	1	.8	1.0	96.1
	15.Global warming	1	.8	1.0	97.1
	16Land mines	1	.8	1.0	98.1
	17Discrimination	1	.8	1.0	99.1
	18.No answer	1	.8	1.0	100
Total		104	85.9	100	
Missing system		17	14.1		
Total		121	100		

The researcher wanted to know what actions learners took to solve these problems at school or at home. In EE actions are important in that they reflect the learners' commitment to solving environmental problems. The results to Question 5 are shown in Table 13, p: 66. About 23.1 % of the learners indicated that they picked up paper while 38.8% of the learners did not respond to the question, which is a serious matter of concern. Other actions involved planting trees, writing articles to authorities, in repairing taps, filling gullies and researching. Approximately 38.8 % of the learners said that they did not do anything. Although these results show that some learners took real actions to

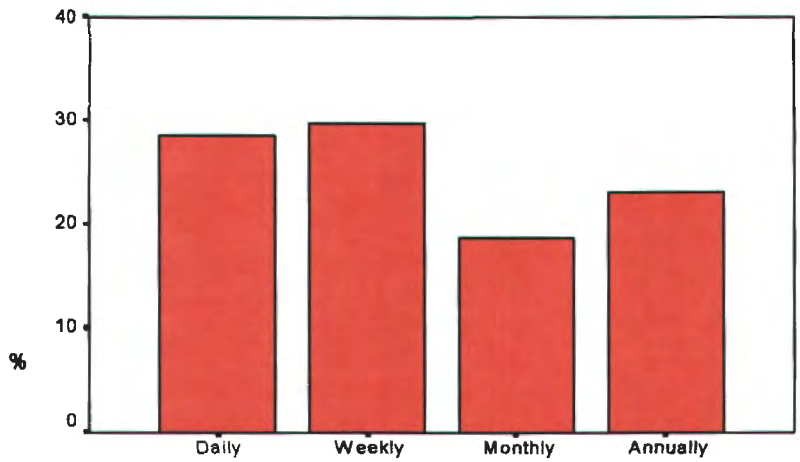
solve environmental problems other did not do anything. This is a matter of concern and shows the need for effective EE at school level especially the action-learning element.

Table 13: Learners' actions taken to solve environmental problems

		Number	percentage Of total	Valid percent	Cumulative percent
	1.Awareness campaign	16	13.2	26.3	26.3
	2.Pick up papers in a group	28	23.1	42.1	68.4
	3.Plant Trees	8	6.6	3.2	71.6
	4.Write articles and Posters to authorities	1	.8	3.2	74.8
	5.Repair taps	1	.8	1.1	75.9
	6.Fill gullies	1	.8	1.1	77
	7.Research on causes of soil Erosion	1	.8	23	100.0
	8.Nothing	47	38.8	100.0	
Total		103	84.1		
Missing		18	15.9		
Total		121	100		

In an effort to measure the attitudes of learners towards the idea of solving environmental problems by action taking, in Question 6 the researcher wanted to find out how often the learners have taken efforts to solve some problems mentioned in the table above. The results of this question are shown in Figure 21, p: 67. From these results it can be seen that 28 % of the learners said that they carried out these actions daily while 29% said that they did so weekly. The remaining percentage said that they carried out these actions on a monthly basis. These results indicate that actions are there but not done daily by all learners. This suggests the need for a change in learners' attitudes.

Figure 21: Bar graph that shows learners' attitudes towards solving environmental problems



4.3 Conclusion

In this chapter the results of the research and findings have been presented. Conclusions and recommendations that are shown in Chapter 5 are based on the results showed in this chapter.

Chapter 5: Conclusions and recommendations for effective incorporation of EE into the Namibian secondary school curricula

5.1 Introduction

Chapter 4 presented the research results. Based on these results, this chapter will draw conclusions, highlight limitations of this study and more importantly make recommendations for effective incorporation of EE into the secondary school curriculum in Namibia. The main body of this chapter is divided into five subsections; the first revolves around the conclusions that have been made by the researcher. The second section presents the limitations of this study. The Third section comprises the exposition of recommendations for effective incorporation of EE into the Namibian secondary school setting. In the final section the research hypotheses are revisited, tested and the implications for research are shown in the light of the recommendations of the study. In the conclusion the researcher shall call all stakeholders to take an active role in supporting EE in Namibia.

5.2 Conclusions

Although EE is part of the secondary school curriculum in Namibia, it is not well developed within the documents of the MBESC. It is regarded in most documents as environmental awareness rather than EE. This is a problem because environmental awareness is only one dimension of EE and is exclusive of other dimensions essential for the teaching and learning of education for the environment.

In addition, this appears to be in line with the nature of EE in the Namibian secondary school system. One could conclude that EE in Namibia is more knowledge based. This is so because understanding of environmental problems and their associated causes appears not to be the main problem among teachers and learners in Namibia. EE in Namibia largely revolves around the integration of knowledge dimensions with lack of integration of values and attitudes and to a lesser scale on the integration of some action and skill

dimensions for the environment (refer to Chapter 4, p: 40- 41). These actions are in the form of cleaning up programmes at school, filling the gullies formed by erosion and tree planting on special environmental days.

After a thorough analysis of the results of this research it became clear that EE in the secondary schools suffers major barriers in the curriculum. These barriers are lack of teacher training especially for the Senior Secondary Phase, lack of EE coordinators in schools, lack of school EE policies, lack of interdepartmental collaboration at school level, textbook learning, lack of knowledge about how to incorporate EE into all subjects, resistance to change, heavy reliance on donor support and emphasis on carrier subjects. Some of these barriers shall be briefly explained below.

The Ministerial level of curriculum decision-making has not adequately infused Teacher education programmes (Pre-service and In-service) into the Namibian teacher education system. Although there have been some efforts by Et Project, the LS Project and the MBESC to promote teacher education programmes for Namibian secondary school teachers, the emphasis has been put on teachers of the JSP. The senior secondary school teachers have not had any direct EE teacher training programmes built into their study programmes.

Not all subjects in the broad curriculum are used to address environmental issues in the curriculum. One could say EE issues are only integrated within the traditional subjects of the environment (see Chapter 4, p: 40). Some subjects such as Accounting, Typing, Mathematics, and R.M.E as well as some Local languages are not utilised to address environmental issues in the broad curriculum. This issue is, amongst others, compounded by lack of interdepartmental collaboration.

At **Meso level** there is a lack of interdepartmental planning. This is a major problem that would impede the incorporation of EE into the Namibian broad curriculum for secondary schools. There are a large number of subjects that could be used to teach environmental issues in the Namibian schools but there is a lack of interdepartmental collaboration.

Most of the subjects that do include EE are those traditional science related subjects. Even in these subjects there is a lack of interdepartmental planning. This situation leads to the exclusion of some of the subjects that could contribute by adding different environmental perspectives. This is because teaching planning is still compartmentalised, it is done according to the subjects and departments and not across subject departments. This kind of teaching restricts interdepartmental collaboration and cross-curricular teaching. Most teachers rarely sit with teachers in other departments to plan for the teaching of environmental issues through the lens of their subjects. Every department and teacher is still on its own in terms of planning for teaching of his or her subjects. When this happens some subjects that do not directly deal with the environment will be excluded from contributing to the understanding of environmental issues.

This scenario also leads to negative implications for the efficient use of resources because if not all teachers can sit and plan together, they will not know how and which instructional resources can benefit all subjects in the broad curriculum. Though the introduction of interdepartmental planning resources may be used across the curriculum and department thereby ensuring efficiency in the use of resources and improvement in the quality of teaching and learning of EE.

A good number of **teachers** in Namibia **show a partial understanding of the concept of EE**. Most teachers view EE as education focusing on the environment. Very few of them regard EE as education for the environment that should refer to the total programme of the school. Some teachers have a strong feeling that their subjects do not have anything to do with the environment and EE. This shows that teachers could resist the incorporation of EE into subjects they teach unless guided to see differently.

All Namibian **teachers do not universally understand the concept of cross-curricular teaching**. This is shown by different understandings that they attach to the concept. Some of them feel that it is teaching in the English medium while others contend that it is successive or continuity teaching i.e. teaching from one level to another. This lack of understanding about cross-curricular teaching may make the cross-curricular teaching of

EE difficult to accomplish. In this regard Murray in Loubser (1997: 25) contends that "In fact, the different perceptions that teachers have of what constitutes cross-curricular work have led to confusion, and, ultimately, failure to get cross-subject work built into the curriculum of many schools".

Teachers in **Namibia have shown that they have the ability and skills to find resources and use them**. A significant portion of teachers indicated that they use magazines and posters as resources for teaching. This creativity on the part of teachers hold implications for EE in that teachers will have to find resources in the face of a lack of textbooks.

Teachers and **learners** in **Namibia display a good knowledge of problems of the environment and their associated causes**. These problems largely appear to stem from their own experience as well as those that are drawn from books to which they are exposed, but they appear confused about possible actions for solving them. This is because some of the actions suggested are purely theoretical in nature and not practically oriented. These theoretical solutions are awareness campaign, advice and education and research on causes of soil erosion. Significant portions of learners and teachers indicated concrete actions taken against the problems they identified. These actions are filling gullies, picking up papers, repairing and closing taps.

EE in Namibia is not fully incorporated into the school activities. This is because the school management, a whole school ethos, entire school programmes of all teachers did not display essential characters of EE. All the factors mentioned above will have to be established at schools if EE is to be implemented in the manner it should.

As shown in Chapter 4, **most schools in Namibia do not have adequate resources or structures that will facilitate the incorporation of EE into the secondary school system**. There is a lack of EE coordinators, school EE clubs, and EE magazines. More importantly fieldwork is still outside the educational experience of some of the learners.

Even with problems such as the above in the school system, tremendous opportunities for the incorporation of EE into the Namibian secondary school curriculum still exist. This is because there are little cross-curricular disciplines in the Namibian broad curriculum for secondary schools, other than health education and population education. The analysis of the content of these disciplines shows that they include environmental issues. Secondly, efforts made by the MBESC, the Et Project of the DRFN and the LS Project of Ibis Namibia are all stepping-stones that will enhance the incorporation of EE in Namibia. Finally some teachers have shown interest in EE and have indicated a need for more guidance and training in the discipline. These are some of the factors that show that barriers in the incorporation of EE could be overcome if a proper strategy was put in place.

5.3 Limitations

There are certain limitations that have impeded this study. In this case limitations are viewed as all factors that have influenced or were likely to influence the outcome of the study. There are several limitations that the researcher experienced during the study but the following are of major importance:

The first limitation revolves around the teachers who were willing to be interviewed. Most of those teachers who were willing to be interviewed were those whose subjects are traditionally seen as including the environment but not necessarily EE. Only a few teachers whose subjects were not typically seen as including environmental issues participated in the interview. EE is the responsibility of all teachers so the researcher feels that many teachers whose subjects are not traditionally environmental should have been allowed to participate in the interview with the view that their ideas and perceptions about EE can be heard. This is essential because an implementation strategy for EE should take all appropriate views into account.

Another limitation revolved around the balance of learners who were selected for interviews. Most of the learners were senior learners, although the researcher had envisioned that a balance of learners from grades 10 to 12 be interviewed. The researcher

realised that the majority of learners who came for interviews were from grade 12 rather than grade 10 and 11. This was because most school authorities preferred to send more of their best grade 12 learners to the interview.

5.4 Recommendations for effective incorporation of EE into the Namibian broad curriculum for secondary schools

EE is an approach to all education, however it is not properly institutionalized into the majority of the secondary schools in Namibia. In 1992, at the Rio Conference, the government of the Republic of Namibia re-iterated its commitment to ensure that EE is part and parcel of the learning experience of every pupil in Namibia. In support of this, the researcher proposes the following recommendations that would facilitate the integration of EE in all schools at the secondary school level.

1 Teacher Education and Training in EE

1.1 The first step in an attempt to overcome most of the problems stated in section 5.2 and ensure the incorporation of EE into the Namibian secondary school curriculum is an intensive teacher education programme. Stone (1989) and Sterling in Ballantyne & Oelofse (1989) maintains that teachers are important instruments when infusing EE into the school curriculum. Most teachers in Namibia have not been directly trained to deal with environmental issues. This raises the importance of training for teachers and teacher educators in Namibia. Ham and Sewing (1988:23) support this view, by maintaining that " One way to promote this integration is to indoctrinate students in teacher education programs into a multidisciplinary view of EE". In Namibia, training modes to be applied are twofold. That is Pre-service teacher education (PRESET) and In-service teacher education (INSET). Preservice teacher education is a type of training whereby student teachers who are not yet officially part of the teaching profession are adequately educated so that they become certified teachers, while the latter refers to education centered on the teachers who are already in the field of teaching. The current pre-service teacher education programme is centered on junior secondary teachers while senior secondary teachers have not been given any opportunity for direct training in the field of EE. This

will mean that a large number of qualified teachers will have to go through in-service teacher education in order to be certified as EE educators. The training of in-service teachers should not be a one off occurrence but a continuous activity. Loubser and le Roux (2000:98) maintain "INSET should not be viewed as an isolated or chance event in a teacher's career, but as ongoing and continuous occurrence essential for educational and professional efficiency". Doing so will ensure that teachers are updated with knowledge, skills and latest instructional methodologies for effective incorporation of EE into the broad curriculum for secondary schools.

Training of teachers in EE is indispensable because they can carry out a number of vital functions. Trained teachers will gain appropriate knowledge, skills, attitudes and values to teach EE. They will have skills and knowledge and take actions to build structures that will facilitate the incorporation of EE into the curriculum. They may establish school EE clubs, write magazines and more importantly encourage other teachers and subject heads to incorporate EE whenever possible. They will also have the skills and expertise in managing fieldwork techniques.

1.2 The training of teachers alone will not proceed smoothly if teacher educators do not support EE aims and goals in Namibia. This implies that the teacher educators should be invited to conferences, workshops and seminars so that they gain understanding of EE goals and objectives. According to Hungerford and Volk in Stone (1989: 160) "one way to promote this is to "to 'hawk' EE goals and the need for their implementation at teacher education conferences and to do so until the message is internalized". In the Namibian situation, this task can be successfully carried out by NEEN, the MBESC (NIED in particular), the DRFN, the Rössing Foundation and all the other stakeholders. They should continuously invite teacher educators from the institutions of higher learning in the country so that they learn to understand the goals of EE thereby ensuring its incorporation into training programmes for all secondary teachers.

1.3 The training of teachers should also focus strongly on how teachers could incorporate environmental values education (EVE) into teaching and learning of EE. This is because

the researcher believes that a comprehensive teacher education campaign should focus strongly on how values could be incorporated into the learning and teaching of education for the environment. EE teaching should not only emphasise the knowledge, action and skills dimensions but also on the values and attitude dimension of EE. Bennett (1989:17) underlines the fundamental importance of values in solving environmental problems. He contends "Values we hold play a central role in environmental problems...they are so powerful that they have a pervasive influence over our lives and guide our actions". In view of the importance of values in solving environmental problems, Iozzi (1989), Caduto (1985) and Newhouse (1990) suggest strategies for the inculcation of environmental values in learners. These include awareness raising and identification of personal values, analysis of how personal values impact on the environment, determination of what behaviour needs to be modified, implementation of sound environmental values, inculcation, action learning, moral development, confluent education, modeling and mere exposure. If teachers are made aware of these strategies and others during training, they are more likely to be empowered with the ability to teach EVE. This is essential because environmental actions will be determined by the environmental values that we hold and hence result in maintaining the sustainable living styles in a community.

2 Appointment of EE coordinator at schools

The appointment of an EE coordinator must be maintained in all schools in Namibia. The national education authorities should encourage all school authorities to appoint a school level EE Coordinator. The National Association for Environmental Education (NAEE) in Neal and Palmer (1994: 107) maintains, "It is difficult to see how environmental education can be delivered effectively unless the school have a member of staff responsible for its co-ordination". The EE coordinator may be a staff member who is dedicated to the cause and delivery of EE. In Namibia, schoolteachers for Life science or Natural economy may be appointed to oversee the smooth functioning and implementation of EE at school. The EE coordinator could also perform a variety of functions that are of importance in the incorporation of EE in Namibian secondary schools. These functions include advising teachers how to incorporate EE into their

subjects, providing updates to teachers on the current instructional strategies and assessment for EE, encouraging teachers to incorporate EE into subjects whenever possible and to monitor the implementation of EE within the secondary school curriculum.

3 EE policy for schools should be formulated

The school environmental policies are essential where EE is part of the school curriculum. The school policy is a document that should represent the school's commitment to EE. Wheatly in Hall (1992:32) contends:

> An environmental policy should be an intrinsic part of the school development plan. It serves to project the overall philosophy of the school, encompassing curriculum development and ethos. It is likely that the motivation behind the establishment of such a policy will be drawn from a sense of responsibility to the community, a response to pressure of staff and pupils, the need to save money through such acts as energy conservation or even making the school a more attractive proposition to potential pupils and their parents.

In order to ensure effectiveness of school policies, a whole school approach, ethos and management must be taken and all teachers, the entire school progarmme and all learners must support and live according to it.

Furthermore, learners in Namibia do not generally participate in the formulation of school policies, which would help in effective learning. It is recommended that all learners be involved in the process of policy development for EE. It should also be borne in mind that this is not a one off activity. It is a process that should proceed throughout the education of learners. As learners participate in policy development, they may learn environmental skills and concepts.

4 Interdepartmental collaboration and planning is recommended

Interdepartmental collaboration and planning is recommended. Collaborative planning should allow teachers from various departments to sit together when planning their teaching. This is important because it will help in the facilitation of the multidisciplinary approach to the teaching of EE in the school. With the help of an EE coordinator, subjects that contribute to the learning of environmental issues are identified and used. Collaboration cannot be achieved through the efforts of an individual teacher. It needs support of a variety of stakeholders. Stuart (1994:363) maintains that:

> A strategy for the successful implementation of environmental education across the entire spectrum of the curriculum will depend on the internal organisation, management structure, the support of governing bodies, staff motivation and involvement and a host of other factors.

These structures and factors are important elements in the incorporation of EE. Support structures must be in place before interdepartmental planning is implemented.

In the absence of the structures mentioned above, the EE coordinator would be tasked to establish them. He/She should also convene an EE-working group that will help him/her in the process of establishing those structures that facilitate EE. Furthermore, Loubser (1996) recommends two approaches that can be used to introduce EE across all the departments of the school. These are bottom up and top down approaches. The former approach calls for the teachers with the help of an EE coordinator as initiators of interdepartmental planning while the latter refers to an approach whereby senior members of the school decide to take the initiative. Whatever approach may be taken, it is recommended that the management of school be supportive and make it part of the school's educational plan.

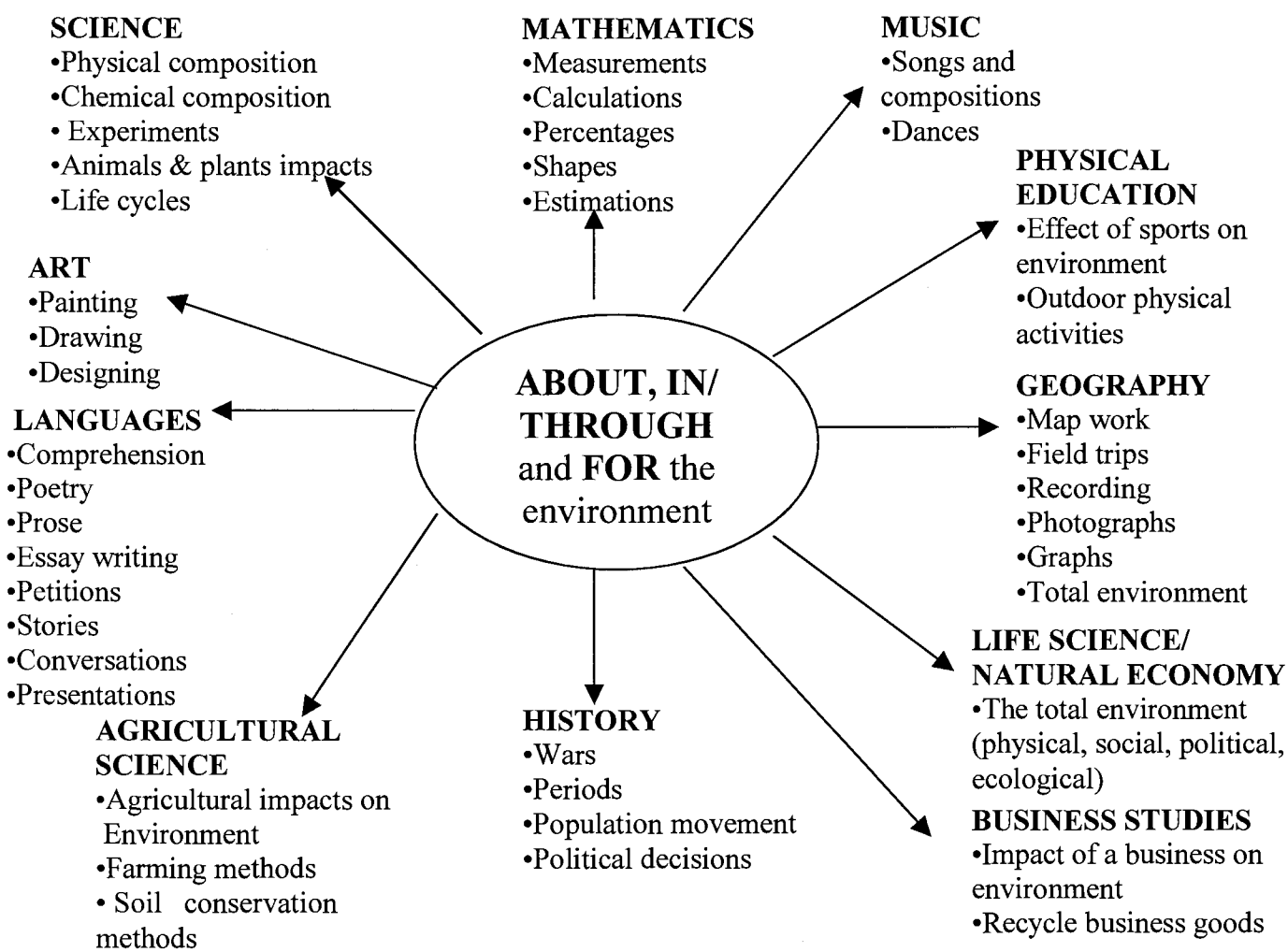
In order to achieve inter-departmental collaboration, the researcher suggests that schools follow the steps mentioned below. These steps require the support of all the stakeholders. The steps are not exhaustive. They represent a framework that could be used by

individual schools to plan for cross-curricular teaching in a manner that involves all departments and subject disciplines. Step one and two may be carried out once or twice in a year while the last six steps will be repeated every time there is a need for planning of this type of teaching. This process may be done once or twice or even more during a term depending on the timetable limitations.

- **There is a need for identification of real environmental issues/problems faced by the local area**. These issues represent problems of the environment that have been observed in the local area. In the JSP learners may identify local environmental problems while learners in the Senior Secondary Phase may be given an opportunity to identify problems in other parts of the world. These problems or issues are identified so that education can focus on the situation. Learners should be involved in the identification of these problems/issues. A register class teacher may be used to involve learners. He/she should give them time to write down the environmental problems that they have observed over a period of time on a piece of paper. These problems will reflect on the programme of the whole year.
- **Prioritisation of EE issues.** When environmental problems are identified, the second step is to prioritise them. This step entails that teachers decide on the best time to teach a particular issue. This is important if we are to solve the problem immediately. An example would be when teachers decide on a topic of soil erosion, it may be necessary to cover such a topic during the rainy season so that immediate action to fill the gullies caused by rain are taken. This prioritisation is determined by the best time of year for teaching a particular topic.
- **Deciding on the subjects to be used in the teaching of an environmental issue/problem**. Deciding on the subject to use in teaching a particular topic is the most important stage. The Wisconsin Department of Public Instruction (1991:83) contends, " elements of environmental education usually will not need to be "infused" into subject area curricula because they are currently there. But they will need to be identified and appropriately emphasized in subject area curriculum plans". In this regard teachers, with the help of an EE

coordinator will have to sit together and identify subjects that will help address a particular environmental issue. It should be known that not all subjects contribute in a similar way to learning about the environment. According to EEPI (1995) and Blowers in Blackmore (1994) not all subjects can contribute to EE in a similar way. Some subjects can contribute more on one topic than the others. In view of this, the researcher contends that subjects that can greatly contribute to a particular topic could be identified and then investigated as to how they contribute. Care must be taken to ensure that the subjects are chosen from all departments and not only one department. Those subjects that are not appropriate may not be used. In Figure 22, p: 79, the researcher suggests a generic framework about how subjects could contribute to the learning and teaching of environmental issues. This is just an example for guiding teachers on how they could use subjects to plan for teaching. The EE coordinator should help define these guidelines in operational terms.

Figure 22: Chart that shows how some subjects could contribute to EE



- **Time tabling EE issues.** These subjects, once identified, are put on the timetable using existing slots. The main aim is not to make drastic changes to the timetable. Care must be taken to ensure that the slots for those subjects identified to address a particular issue are used.
- **Lesson Planning**. Planning of lessons should take root, which means that with the help of the EE coordinator, teachers who will be involved in teaching a particular subject will be assisted in the process of planning and setting of objectives.
- **Teaching and monitoring of teaching activities.** This is the time for teaching a particular topic during which various subject teachers convey the environmental ideals through the lens of their subjects. The management of the school and the EE coordinator should in this case monitor the process. Teachers also report problems and successes with the approach.
- **Augmenting cross-curricular work.** Cross-curricular work should be cemented or strengthened. This can be done through fieldwork activities in which learners are allowed to go out and observe the issue that has been dealt with in class. It is also an opportunity to take action in cases where an educational activity needs action as a follow up. Experts outside of the school or any other member of the school community who is knowledgeable may be used to supplement learners' acquired knowledge.
- **Evaluation**. Evaluation entail the gathering of information that enables the school authorities decide whether the planning process and the actual teaching process has progressed smoothly. This information can be disseminated to all stakeholders at school as part of an EE promotional strategy. All successes may be reported on at the annual prize giving ceremony or using the EE magazine that the school has established.

5 Fieldwork as an instructional technique is recommended

In addition to the recommendations given above, fieldwork as an instructional technique is strongly recommended. Nightingale in Opie (1989:36) identifies reasons why fieldwork is an important instructional activity in EE.

> Fieldwork is an integral part of the natural sciences, fieldwork encourages the development of critical faculties if pupils are given the opportunity to learn at first hand, fieldwork assists pupils to gain a genuine understanding of concepts, fieldwork enables teachers to make their subjects come alive, fieldwork leads to many fringe benefits, fieldwork also leads to a concern for the environment, fieldwork is sound educational practice.

Given the importance if fieldwork, it is obligatory that it be made part of the school's instructional strategy. Teachers need support in the process of managing and preparing fieldwork instructional strategies. According to Bornman (1997b: 247) "the increasingly important role of fieldwork is of major importance in communicating environmental education *about*, *through/in* and *for* the environment. Teachers need physical (especially financial) support as well as support in terms of expertise provided to acquire confidence in fieldwork techniques". Fieldwork may not necessarily have to be from far away places. It could be conducted within the walking distance of the school. Farms, gardens, school grounds and streets in and around the school may be visited. Iozzi (ibid: 9) maintains:

> at lower grades, walking tours around the school grounds can be very rewarding for children. Examination of their surroundings provides students with opportunities to observe and discuss what they like, dislike, and would like to improve about their surroundings. Older children can be taken on day-long field trips to a variety of sites to learn first hand about different environments and environmental problems. Such trips need not be to pristine natural areas only; visits to environments not usually considered for field trips can be most rewarding.

Given the importance of fieldwork, school authorities should be convinced to allocate four to six days per grade each year for fieldwork activities.

6 Strengthen the capacity of NEEN

A final and most important recommendation that can be made in this regard is that the capacities of NEEN (refer to Chapter 1, p: 2) should be strengthened. This strengthening should be in the areas of staffing, financing and increasing membership.

NEEN therefore needs support of qualified and dedicated staff. Permanent and well-qualified people may be employed to run the offices of NEEN. NEEN should invite the participation of the community, nongovernmental organisation, governmental organisations and all the other stakeholders in the process of initiating EE in Namibia. By so doing, the goals and objectives of EE will be supported in Namibia.

5.5 Testing the hypotheses

Hypothesis 1 (refer to Chapter 1: p: 5-6) that EE is not incorporated effectively into the secondary school curriculum has been confirmed. As has already been stated, EE is incorporated only in the traditional science related subjects of the environment while non-environmental subjects have not been used (see Chapter 4, p: 40-41). Trained teachers in both Senior Secondary and JSP would help overcome these barriers.

Hypothesis 2 (refer to Chapter 1, p: 6) has been confirmed. The education system largely addresses the knowledge and understanding dimension and on a small scale addresses the action and skills dimension of the environment (refer to Chapter 4, p: 40-41). The attitude and values dimension has not been directly incorporated into the secondary school curriculum in Namibia (refer to Chapter 4, p: 41). It has been recommended that teachers should also be trained in the arts of EVE so that they are able to present it with confidence (refer to Section 5.4, p: 75).

5.6 Implications for further research

This study is regarded as a baseline study. It lays the foundation for establishment of structures that will facilitate the incorporation of EE into the school system. As soon as these structures and recommendations are put in place, research will have to be carried out in order to show how EE has been incorporated. The implication of this is that barriers to EE that continue to be experienced after incorporation are uncovered and fully addressed. Secondly, the teaching methods and strategies that could be used to teach EE effectively is another area for further research. The methods and teaching strategies would ensure that effective incorporation is maintained. Another important area of research will be about how EE across the curriculum has contributed to the improvement in the quality of teaching. This research will serve as a promotional strategy for the incorporation of EE. This is because the stakeholders and community will see the positive results of EE across the curriculum. They will find it a worthy cause and make efforts to support it.

5.7 Conclusion

EE as an approach to all education has been identified by international organisations and conferences in order to solve the growing environmental problems facing mankind today. The Earth Summit's Agenda 21 in Blackmore (1994:38) maintains "Governments should strive to update or prepare strategies aimed at integrating environment and development as a cross-cutting issue into education at all levels within the next three years". In response to the UN call, the Namibian government has made efforts to incorporate EE into the secondary school curriculum with a view to reaching goals of sustainable development and improvement in the quality of teaching (see chapter 2). Despite these efforts there are some problems in the Namibian education system that are still preventing the incorporation of EE into the curriculum. Chapter 5 outlines these problems. These problems will have to be overcome for EE to be incorporated effectively and ensure solutions to growing environmental problems that are affecting the country. Chapter 5 makes a number of recommendations that are essential in this regard. These include teacher education and training for all phases of the secondary school.

Furthermore, if the incorporation of EE is to take place then all stakeholders need to work together.

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7 APPENDICES (see Table of Contents)

Appendix 1

Dear Respondents

I am working on a research project, which focuses on the incorporation of environmental education (EE) in the Namibian secondary schools. Kindly help by filling your views in spaces provided in the questionnaire. It is not an examination or inspection. Care will be taken to ensure that your views are treated with utmost confidentiality and no efforts would be made to link views to a particular respondent.

Your contribution in this regard is highly valued.

I thank you for your support.

Yours faithfully
Alex Kanyimba.
Tel: 264-61-2063650 (W)
Mobile: 264-0811278568

Subsection A. Macro Level: Curriculum Development Experts in the Ministry of Education, Culture, Youth and Sport.

1. Is environmental education (EE) part of the broad curriculum for secondary schools in Namibia?

   ☐ Yes ☐ No

2. Which of the following subjects do you use to support environmental education in the broad curriculum for schools?

   ☐ Life science

   ☐ English

   ☐ Geography

   ☐ Mathematics

   ☐ Physical science

   ☐ Typing

   ☐ Life Skills

   ☐ Life science

   ☐ Physical

   ☐ Any other (specify)

3 . Which of the following models of EE do you use to address environmental issues in the broad curriculum for schools?

   ☐ Separate subject

   ☐ Integrated model

   ☐ Any other (Specify)

4. Do you have a National EE policy?

   ☐ Yes ☐ No

5. Are there efforts to train teachers in EE through:

   ☐ Pre-service Teacher Education

   ☐ In-service Teacher Education

6. Are there guidelines for addressing the attitude and values dimension of EE in the broad curriculum for secondary school in Namibia?

7. What attempts have been made to link national environmental days to the broad curriculum for secondary schools in Namibia?

8. Are there EE coordinators in the Namibian staff establishment?

   ☐ Yes ☐ No

Thank you for your support, I value your contribution

Subsection B. Meso –Level: School Principal or any other Management Member.

1 Name of the school

2 Do teachers from various departments at school sit together to plan for cross-curricular work?

☐ Yes ☐ No

3 Are all members of the management involved in the supervision of this cross-curricular work?

☐ Yes ☐ No

4 Do you involve learners in this process?

☐ Yes ☐ No

5 Do you have an environmental education (EE) coordinator?

☐ Yes ☐ No

6. Do you have a school policy?

☐ Yes ☐ No

7. Does this policy support EE at this school?

☐ Yes ☐ No

8. Are learners involved in the writing of this policy?

☐ Yes ☐ No

9. Are learners involved in science expo or environmental competitions?

☐ Yes ☐ No

10. Which of the following environmental days do you participate in annually?

☐ World wetlands day (2 February)

☐ World Meteorological day (23 March)

☐ World Environment day (5 June, Environment week)

- ☐ Arbor day (First Friday in September)
- ☐ World ozone day (16 September)
- ☐ Heritage day (24 September)
- ☐ World Tourism day (27 September)
- ☐ World habitat day (9 October)
- ☐ National Marine day (First Friday in November)

11. What environmental problems do you face at this school?
12. What efforts have you taken to solve them?
13. Do learners go on excursion or field trips?

    ☐ Yes ☐ No

14. Do you have an EE club at this school?

    ☐ Yes ☐ No

15. Do you have a school EE magazine?

    ☐ Yes ☐ No

16. Would you be interested in setting up a school EE magazine, if you do not have one?

    ☐ Yes ☐ No

Thank you for your support, I value your contribution

Subsection C: Micro Level: Subject teachers.

1. What subject/s do you teach?
2. Do you teach environmental issues through the lens of your subject?

   ☐ Yes ☐ No
3. How would you define ' Environmental education' (EE)
4. How do you define ' Cross curricular teaching'?
5. What environmental problems do you face at this school?
6. What hands on efforts have you made to solve these problems?
7. Show how you have incorporated EE into your subject/s?
8. What additional materials do you use to address environmental issues in your class?
9. Have you included environment related questions in tests and examinations?

   ☐ Yes ☐ No
10. Anything you would like to say that relates to EE.

Thank you for your support, I value your contribution

Subsection D. Micro Level: Learners. Received curricula

1. In which grade are you?
2. Name of the school.
3. How would you define the concept 'environment'?
4. What environmental problems do you face in your country?
5. What actions have you taken at your school to solve these problems?
6. How often have taken these actions in 5?

☐ Daily ☐ Weekly

☐ Monthly ☐ annually

Thank you for your support, I value your contribution

Appendix 2

AN ENVIRONMENTAL EDUCATION POLICY FOR NAMIBIA

NAMIBIA ENVIRONMENTAL
EDUCATION NETWORK

MARCH 1995

Policy Statement

"Namibia will actively encourage, support and implement environmental education as a means of achieving and fulfilling Article 95 of the Constitution. Environmental education should aim to empower Namibians, from all sectors, to critically evaluate environmental information and options, to make informed decisions, and to take actions that will contribute to the goal of environmental and economic sustainability."

Preamble

The Government of the Republic of Namibia and endorsing agencies recognise that:

1. *"the State shall actively promote and maintain the welfare of the people by adopting policies aimed at...*

   The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and the utilisation of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future..."

   [Constitution of the Republic of Namibia - Article 95]

2. environmental education is important, as Namibia is a signatory to the *Convention on Climatic Change, the Convention to Combat Desertification, and the Convention on Conservation of Biological Diversity* as well as *Agenda 21* which recognises environmental education as an integral part of the move toward sustainable living. The importance of environmental education is also reflected in policy documents from a number of Namibian sectors.

3. there is an urgent need for the inclusion of environmental education in all spheres of life and that it should be grounded in critical and innovative thinking and promote the transformation and construction of society. Fundamental issues in relation to the environment and development include population, health, peace, human rights, democracy, hunger, and degradation of flora and fauna. land, water !!

4. striving for sustainable living is an ongoing process of learning and adapting to changing present and future conditions.

5. Namibia is dependent on natural resources and certain biophysical components are vulnerable to environmental degradation. It is specifically acknowledged that Namibia is an arid country and has a scarcity of water and thus requires wise management. Natural resources are intimately linked to economic development. It is also acknowledged that Namibia's past has led to inequities in access to biophysical and other resources. Environmental education, through the development of skills and attitudes, has an important role to play in both enabling wise management and contributing to redressing problems that are a legacy of our past.

6. environmental education must facilitate equal partnerships in the process of decision making at all levels and stages. It must integrate skills, values, attitudes and actions and convert every opportunity into an educational experience for a sustainable society.

7. environmental education is not neutral but is value-based. It is an act for social transformation.

It is declared that the following are fundamental to Namibia's Environmental Education Policy:

1. Central to the concept of environmental education is the development of environmental literacy. This should assist in empowering all Namibians to regain control of their destiny through participation in decision making at a local and national level.

2. Environmental education will place emphasis on:

   - stimulating dialogue and co-operation among individuals and institutions in order to create new lifestyles which are based on meeting everyone's basic needs - regardless of ethnic, gender, age, religious, class, physical or mental differences - in a sustainable fashion.

   - developing an ethical awareness of all forms of life with which humans share the planet.

   - recovering, recognising, respecting and utilising indigenous history and local cultures, as well as promoting cultural, linguistic and ecological diversity.

   - recognising interdependence of both living and non-living systems. Actions in one system can have effects on other parts of the system or other systems.

3. Namibia shall pursue an active programme to achieve sustainable living through, inter alia, an active environmental education programme in accordance with the Environmental Education principles which follow.

The following principles guide Namibian environmental education

Environmental education

1. considers the environment in its totality: natural and built, technological and social (economic, political, technological, cultural-historical, moral, aesthetic);

2. is a continuous process, beginning at the pre-school level and continuing through all formal and non-formal stages and involves all sections of the Namibian population. Education is the right of all; we are all learners or educators;

3. must involve an holistic approach and thus an interdisciplinary focus in the relation between human beings and the environment;

4. examines major environmental issues from local, national, regional and international points of view so that Namibians gain insights into geographical areas;

5. values all different forms of knowledge. Knowledge is diverse, cumulative and socially produced and should not be patented or monopolised;

6. promotes the value and necessity of local, national and international co-operation in building environmental literacy;

7. enables people to have a role in planning their own learning and provides an opportunity for making decisions and accepting the consequences;

8. relates environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on the youth;

9. enables people to discover the symptoms and causes of environmental problems and explore and critically evaluate solutions and apply them where possible;

10. emphasises the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;

11. utilises diverse learning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on practical activities and first-hand experiences;

12. is carried out in an environmentally sound manner.

Namibian environmental education aims to:

- develop an understanding of the local, regional and global, environment; its associated benefits, problems, solutions, and procedures for implementing those solutions;

- foster attitudes and values that develop environmental responsibility and active participation in achieving a higher quality of "being";

- share and develop skills for identifying, critically evaluating and solving environmental problems;

- actively encourage participation of individuals, groups and government in acting positively in the prevention and solution of environmental problems and to support mechanisms (social, political and moral) which enable people to take control of their lives and environment;

- be flexible and dynamic, thereby adapting as new problems and issues arise;

- where appropriate, follow guidelines and recommendations set out in those international Treaties, Conventions and Agreements ratified by Namibian Parliament;

- recognise and incorporate local and traditional knowledge and take cognisance of cultural and religious beliefs.

Namibian environmental education will focus on the following approaches:

The following constitute the basic approaches for the implementation of environmental education in order to achieve the broad aims outlined in this policy document.

1. **NETWORKING**

   This policy recommends that environmental education in Namibia be developed through networking between and among government, donor community, NGOs, CBOs and the private sector. The emphasis will therefore be on participation, sharing, exchanging of ideas and skills among the interested groups. Other functions of the network will include promotion of environmental education in Namibia, ensuring quality curriculum, programme and materials development.

2. **TRAINING AND CAPACITY BUILDING**

   The environmental education community will strive to improve its capacity, effectiveness and efficiency through continuous training and capacity building programmes and endeavour to develop human resources within the interest groups.

3. **CURRICULUM DEVELOPMENT**

   Environmental education initiatives should be involved in curriculum development, whether through the production of their own curricula or through the incorporation of environmental education in formal and non-formal curricula. Curriculum development is a participatory process, and should involve all stakeholders. Curricula affected include those from pre-school to university, including adult education. Curricula should be reviewed and evaluated to ascertain their environmental education approach and content..

4. **PROGRAMME DEVELOPMENT**

   All new projects, programmes and initiatives being developed within the environmental education community should take cognisance of this policy document and attempt to contribute to its broad aims.

5. MATERIALS DEVELOPMENT

Ongoing participatory production, testing and evaluation will form the basis for resource material development for environmental education programmes. Materials will reflect principles and aims outlined in this policy.

6. SENSITISING AND CAMPAIGNING

A concerted effort will be made to sensitise Namibians to environmental issues through, amongst others, the education system, electronic and printed media, the entertainment and advertising spheres. Sensitising and campaigning are to follow the approach outlined in this policy document.

7. RESEARCH, MONITORING AND EVALUATION

Research, monitoring and evaluation are important aspects of environmental education. Research plays an important role in determining opportunities and future directions for environmental education in Namibia while monitoring and evaluation will form the basis for continuous improvement.