THE IMPLEMENTATION OF ENVIRONMENTAL LEARNING IN GRADES 8-10 GEOGRAPHY IN THE CAPRIVI REGION, NAMIBIA

by

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Submitted in accordance with the requirements for

the degree of

Master of Education

in the subject

Environmental Education

at the

UNIVERSITY OF SOUTH AFRICA

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JUNE 2011

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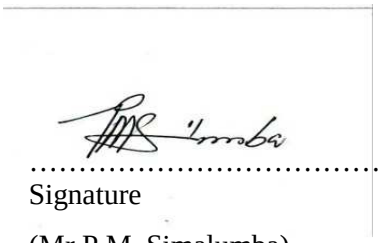
I declare that THE IMPLEMENTATION OF ENVIRONMENTAL LEARNING IN GRADES 8-10 GEOGRAPHY IN THE CAPRIVI REGION, NAMIBIA is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references.



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ABSTRACT

The Namibian curriculum is premised on the view that there is a need for a holistic development and preparation of learners for a knowledge-based society. The draft National Environmental Education policy, the basic education policy and curriculum development processes in Namibia devolved the power and responsibility to implement environmental learning practice to schools.

This research focus on the extent to which schools coordinate environmental education (EE) activities, educators' perception of their environment, knowledge of EE processes, assessment approaches, the out-door activities, learning support materials, community involvement and EE school policy issues. Wickenburg (2000:56) affirms that "for substantial learning to take place, stakeholders should work actively and establish local supportive structures for EE in Schools". Educators are expected to deal with practical issues which create opportunities for learners to develop environmentally responsive knowledge, skills and attitudes.

The research design is a mixed methods research approach, which includes aspects of the quantitative and qualitative approach. The methodology involved data collection methods such as interviews with educators and a local EE officer, focus group discussions with learners and a self-assessment questionnaire for educators. The data was then analysed and interpreted in relation to a set of theoretical perspectives.

The research concluded that educators have knowledge of factual information about environmental learning topics such as population, biodiversity and environmental degradation. Educators have the comprehension of indigenous knowledge and continuously assess learners. Educators however, seldom communicated the way people's cultural activities affect the environment and did not value cultural practice and indigenous knowledge. Many educators did not use the local environments to do practical activities with learners. Schools did not have EE school policy, rarely practised outdoor activities and local communities are not involved school EE activities. Learners are knowledgeable of their local environmental issues. Based on the finding of the research I came up with a list of recommendations to guide the process of implementation of environmental learning at schools.

Key concepts

Subject syllabus, geography, competencies/learning objectives, sustainable development, indigenous knowledge and assessment.

List of abbreviations

CA: Continuous Assessment

EE: Environmental Education

EEASA: Environmental Education Association of Southern Africa

EFA: Education For All

EL: Environmental Learning

ESD: Education for Sustainable Development

GRN: Government of Republic of Namibia

ICT: Information Communication Technology

IK: Indigenous Knowledge

LCE: Learner-Centred Education

MAWRD: Ministry of Agriculture, Water and Rural Development

MET: Ministry of Environment and Tourism

MEC: Ministry of Education and Culture

MoE: Ministry of Education

MRLGH: Ministry of Rural, Local Government and Housing

NPC: National Planning Commission

NEEN: Namibia Network for Environmental Education

NEEP-GET: National Environmental Education Programme – General Education and Training

NIED: National Institute for Educational Development

SADC-REEP: SADC Regional Environmental Education Programme

SEEN: Support Environmental Education in Namibia

WSSD: World Summit on Sustainable Development

ACKNOWLEDGEMENTS

Firstly, I would like to express my thanks to colleagues, friends and the family who supported me during the time of writing this dissertation.

Secondly, I would like to express my sincere thanks to my supervisor, Professor CP Loubser for the invaluable support, guidance and continuous motivation throughout the entire research process. This helped me to complete this independent research journey.

I would also like to thank Ms Beatrice Sichombe for helping in processing of data by using SPSS programme and Ms Jo Coghlan for proof-reading the final copy.

I am also indebted to all schools where the study was conducted for co-operating with me: school principals, educators and learners who participated in interviews, focus group discussions and self-assessment survey.

Lastly I would like to thank an Environmental Education officer in the Caprivi region for her input into the realities of environmental education implementation in the region.

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OVERVIEW AND RATIONALE

1.1 INTRODUCTION

This chapter provides the legislative, policy and conceptual framework for the implementation of Environmental Education (EE) in Namibia, as ratified by international treaties and agreements. The draft EE Policy (1999) document for Namibia will provide the envisaged nature of environmental education. Two key ministries, the Ministry of Education (MoE) and the Ministry of Environment and Tourism (MET), working with the support of the Namibian Environmental Education Network (NEEN), have developed a draft environmental education policy document that establishes guiding principles and aims for environmental learning throughout Namibia.

The purpose for the draft EE policy for Namibia was to create a strategy that included the following elements on a national level:

- co-operation between ministries, institutions and NGOs;
- co-ordination of activities and efforts;
- sharing of resources (facilities, staff, materials).

According to the draft EE policy, the environmental education programmes should aim to empower Namibians from all sectors to critically evaluate environmental information and options, to make informed decisions and take actions that will contribute to the goal of environmental and economic sustainability. This implies that schools should help learners acquire the competencies and sensitivity to address and make sound decisions about environmental issues.

The chapter also provides the background on recent development with regards to the conceptualization and implementation of environmental education. The reasons for the researcher's interest in the study of how Geography contributes to the implementation of EE through formal education curriculum in the Caprivi region in Namibia will be elaborated. Key concepts to the study such as subject syllabus, geography, competencies, sustainable development, indigenous knowledge and assessment will be explained. As the environmental crisis has deepened, more and more people have become involved in trying to resolve environmental issues. Many different approaches, methods and strategies have been developed in different contexts.

Key amongst these has been the development of environmental education processes – in other words, educational responses to environmental issues. This also means that educational processes should aim at social transformation towards sustainable living in healthy environments.

1.2 BACKGROUND TO THE PROBLEM AND INVESTIGATION

The nature and the role of environmental education should be in such a way that the pedagogy of environmental learning should be seen as a catalyst for the enhancement of good education in accordance with reform ideals. In order to understand the background to the problem, it is important to give a brief account of the state of environmental education in Namibia as explained in 1.2.1 below.

1.2.1 The current state of environmental education in Namibia

Since independence in 1990, the Namibian government has given a high priority to environmental concerns. Within the National Constitution Article 95 of the promotion of welfare of the people, it is stated that:

"The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the ...maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future" (Constitution of the Republic of Namibia 1990:56).

Within the above quote, one can detect that the 'environment' is conceptualized in an integrated manner and that it draws on the concept of sustainability with a focus to promote peoples' welfare. The Environmental Management Policy of the Ministry of Environment and Tourism (Namibia 2008:7) and the draft EE policy for the Education Sector (NEEN 1999) statements also reflect Namibia's ratification of international agreements concerning environmental matters. These include the Ramsar (1973), Viena conventions (1988), the Montreal protocol (1990), the Convention on Climate Change (1992), Biological Diversity (1992) and Agenda 21 (1992), Combating Desertification (1994) and Basel (1999) (Namibia 2008:7). The latter agreement clearly notes that "education is critical for promoting sustainable development and increasing the capacity for people to address environment and development issues.

Jickling, Lotz-Sistka, O'Donoghue and Ogbuigwe (2006:17) support this statement in Agenda 21 by stating that "many environmental conventions and treaties also ring the bell louder, signifying that people around the world want better relationships between themselves within communities and nations, and also know that this includes relationships between humans and more-than-human world or between human and the rest of creation".

Vision 2030 (Government of the Republic of Namibia/GRN 2004:13) is a compilation of the wishes of all people of Namibia for the future. It states that *"the national Vision for 2030 is that people of Namibia are well developed, prosperous, wealthy and confident in the atmosphere of interpersonal harmony, peace and political stability and as a foreign nation, Namibia is reckoned and a high achiever in the community of nations. The vision will be achieved through full mobilization of its human and natural resources in a vigorous pursuit to sustainable development, peace liberty and justice in interest of our people, neighbours and the international community"*. Eight thematic areas are elaborated in the vision. The natural resource sector in this Vision (which is applicable in this study) includes chapters on land capability, rangeland and agriculture.

Some of the policies by the Namibian government, related to sustainable development of resources include: Policy on Soil Conservation Act of 1967, Water Supply Policy of 1992, Wildlife Management, Utilization Act and Tourism in Communal areas of 1995, National Drought Policy and Strategy of 1997, Decentralization Policy of 1998, Namibia Environmental Management Act of 1999 and Forestry Act of 2000.

Namibia's third National Development Plan (NDP3) of 2008 identified sustainable development as an important national development strategy. It noted that Namibia's economy was almost totally reliant on natural resources and that a shift towards sustainable development required deep rooted changes in policy and practice, attitudes and skills across a broad range of sectors (Government of the Republic of Namibia 2008:21). An important strategy in achieving this was the need to promote environmental education amongst children and adults by incorporating environmental issues into the school curriculum.

In 1992, Namibia developed a 'Green Plan' for environment and development (Brown 1992). Point 9 of the plan deals with environmental education and training.

Action plans for environmental education in the Green Plan include co-operation between the Ministry of Environment and Tourism and the Ministry of Education and Culture. In accordance with the Green Plan, a policy on environmental education and extension was drafted with the assistance of NEEN, the Ministry of Environment and Tourism, and the Ministry of Education. The aim was to promote a cross curricular approach to Environmental Education in all school subjects.

According to the National Environmental Educational Policy (draft of 1999) environmental education is:

"... the process of developing environmentally literate citizens who are aware of, and concerned about total environment. They will be empowered through knowledge, attitudes, motivation, commitments; skills and shared decision making to individually and collectively achieve an improved quality of life through the sustainable use and appropriate development of Namibia's resources" (NEEN 1999:3).

This is further supported by the Ministry of Education and Culture (Namibia 1998:17) which states that Basic Education will promote:

- *understanding of dynamic interdependence of living and non-living things and the environment;*
- *sense of responsibility for restoring and maintaining ecological balances through sustainable management of natural resources;*
- *learner involvement in practical activities to preserve and sustain natural environment; and*
- *the foundation for informed and responsible attitudes and choices towards the balance of population growth, ecological sustainability, and the quality of lives for all Namibians.*

Namibia, with many other Southern African countries, has a recent colonial history of the exclusion of the majority from the management, benefits and use of natural resources. As the result of unjust laws, unhealthy living conditions in areas of marginal economic activity were the norm. Before Namibian independence, environmental issues were linked to the 'preservation' and 'protection' of resources for the few. Today environmental issues are viewed differently. The complex relationship between environmental issues, human rights, the quality of life and development has been explored much further both internationally and in Namibia. The state clearly recognizes the link between sustainable development and wise management of natural resources and is actively reviewing environmental legislation relating to wildlife and parks, forestry, marine fisheries, water and overall environmental management.

New acts will reflect the shift in policy to empower communities through education. This is because of findings such as that of Mendelson, Roberts and Robertson (2002:127) who indicated that 71% of people in rural areas in Namibia depend on land as a resource.

The research problem lies in the fact that it is suspected that goals in the National Environmental Education policy are not being realized in Namibia. The power and responsibility of putting Environmental Education policy into practice has been devolved to schools. In a decentralised education system schools are required to adapt the EE policy to their local contexts. From 2001-2005 Namibia, through the National Institute for Educational Development (NIED), embarked on a comprehensive revision of the Grades 1-10 curriculum and to localize Grade 11-12 curriculum. Environmental education is one of the cross-curricular issues which was integrated through aims, objectives, content and assessment of different subjects. Support Environmental Education in Namibia (SEEN), supported by DANIDA (Danish International Development Agency) and similar to NEEP-GET in South Africa, helped the MoE with the integration of EE processes through professional development, curriculum development, material and school based implementation (in limited pilot schools). The subtopic in 1.2.2 below will focus specifically on the need for EE in Geography.

1.2.2 The need for environmental education in Geography curriculum in Namibia

According to Pillbeam, Winter, Oelofse and Zukulu (2000:23) the purpose of studying Geography in schools at present is "to enable learners to explain processes and spatial patterns, to make well informed judgements about changing environments and contexts, to think critically and creatively about what it means to live sustainably, to recognize how values and attitudes influence and affect the environment, and to apply a range of geographical skills and techniques to issues and challenges in a rapidly changing world". This suggests a closer link between Geography and EE. It is understood that Geography in the Junior Secondary Phase (Grades 8-10) builds on the skills and knowledge developed in the Upper Primary Phase (Grades 5-7) Social Studies subject. The emphasis is on people, environment and people-environment relationships over time and space. It is envisaged that in the Junior Secondary Phase, abstract thinking and application of knowledge will be further developed.

Bornman (1997:14) argues that traditional philosophies (perennialism and existentialist) of curricula were replaced by contemporary philosophies such as progressivism and reconstruction. The emphasis is a shift from knowledge and information to problem solving and functioning in one's social environment. The school curriculum and its implementation of environmental learning across the curriculum, of which Geography has a strong environmental integration opportunity is of great interest to investigate. Wickenburg (2000:56) also affirms that for substantial learning to take place, stakeholders should work actively and establish local supportive structures for EE in Schools.

Lozt-Sistka and Raven (2002:32) observe that "one of their findings of the learning for sustainability pilot project in South Africa (S.A) was that while educators appeared able to design activities around a particular environmental issue or risk, and link them to specific outcomes from different learning areas (using an integration across the curriculum approach), the design of the activities did not necessarily further the aims of the learning area, or involve a deepening of knowledge or process skills from specific learning areas". Byer (1997:viii) identifies the four key environmental threats to Namibia's environment as:

- *depletion and degradation of water and aquatic resources;*
- *desertification and land degradation;*
- *loss of biodiversity and biotic resources;*
- *decline of marine fisheries.*

Jickling, Lotz-Sistka, O'Donoghue and Ogbuigwe (2006:i) quote a UNEP Executive Director who emphasized that "on global scale, most visitors to his office, from children to politicians, often ask interesting questions related to ethics: issues to do with poverty and environment, climate change and the Kyoto protocol, unsustainable production and consumption, indigenous people and biodiversity". It is argued that environmental issues are best learnt if they are relevant to the needs of the community, involve learner participation through encounter – dialogue and reflection framework of action. Learners need to have an understanding, not only of the issues, but the aspects (social, political, biophysical and economic) that influence humans' decisions around resource use. Schnack and Jensen (1994:137) argue that action-taking in EE has its roots in experiential learning thought: one never comes to fully understand a problem with all its nuances and complexities until one fully immerses oneself in the problem, identifies all the players and begin to work within the field force towards a joint solution.

Byer (1997:27) identifies the following factors to be taken into account when developing strategies:

- *the environmental problems that exist in the community and in Namibia;*
- *the characteristics of the school, college and weakness of the curriculum, skills and enthusiasm of educators and teaching techniques;*
- *the learner and parent expectations about quality of education desired;*
- *age, knowledge, skills and attitudes of educators, including cultural norm and political realities of the community.*

Burt (2003:4) alleges that after scrutinizing the state of EE in the Namibian curriculum, "the curriculum material that directly addressed the themes does so from within the constraints of the subject. For example, Population dynamics/characteristics is a topic in Geography. This is a relevant issue/topic of priority in Namibia. At first glance it looks as though the subject Geography is addressing an important environmental issue. This is not necessarily the case. Population dynamics is approached within the context of understanding and collecting data about a population. Issues relating to this information are usually add-ons".

The reason the researcher decided to explore the implementation of EE in Geography is influenced by limited research reports about effective implementation of EE into the school curriculum in Namibia since the revision of Grades 8-10 syllabuses in 2005. There is also lack of insight into learners' and educators' perceptions about their environment, knowledge of EE processes and the extent to which the local environment and stakeholders are serving as resources in environmental learning. The researcher was also involved with the SEEN project in Namibia which attempted to integrate EE across learning areas and to develop learning support materials and other activities through workshops. The findings of this research will inform policy makers, educators and curriculum specialists of the extent to which environmental learning is conceptualized in the Broad Curriculum for Formal Schools in Namibia. Samuels (1993:26) is concerned that although literature contains much speculation as to the best way to integrate environmental education into the school system, very little research has been done to explore how well environmental education has actually been implemented.

The research will set forth the barriers and opportunities which the school communities face in integration of environmental learning to everyday life aspects of the schools. The research will also give a picture of how environmental learning is integrated in lesson plans and the extent to which authentic assessment is applied.

It is envisaged that through this research, the researcher will be able to support educators to implement EE methods and processes to the maximum potential. This is supported by Car and Kemmis (1996:24) who advocate that a critical component of research aims to help people recover and release themselves from the constraints embedded in social media through which they interact (discourses, modes of work and relationships).

According to the Training Needs Assessment study for Geography Grades 8-10 educators, conducted by the researcher in 2004, 40% of educators who participated in the survey indicated to have difficulties in conceptualizing, conducting and assessing project work on geographical issues as part of continuous assessment tasks. Educators preferred the traditional way of assessment and showed little willingness to include authentic and alternate assessment methods.

The National Curriculum for Basic Education (Namibia 2010:8) states that one of the aims of basic education for the future society is that "there is no atmospheric, land and water pollution from croplands or mines, and minimal pollution from urban and industrial areas. Farms and natural ecosystems are productive and sustainable socially, economically and ecologically." The Geography curriculum content can therefore contribute significantly towards achieving that aim.

1.3 RESEARCH PROBLEM

Little is known about the extent to which Grades 8-10 Geography is contributing to environmental learning in selected schools in the Namibian curriculum. Despite the integration of EE in the Namibian formal education curriculum in 2005, questions remain regarding the extent to which environmental learning in Geography is organized at a school level to facilitate integration. Educators are expected to deal with practical issues and also to create an opportunity for learners to develop environmentally responsive knowledge, skills and attitudes. Environmental issues relevant to Namibia were integrated in the school curriculum but little is known about how educators are promoting learner-centred education, activity-based lessons and action oriented activities at all levels of the education system. Environmental issues are dynamic and educators and learners need to be continuously equipped with knowledge and skills for sustainable living, guided by the principles of access, equity, quality and democracy.

The research problems are:

- Twenty five (25) schools in Namibia participated from an environmental learning project co-ordinated by SEEN which worked with the Ministry of Education. Schools implemented the environmentally integrated curriculum without structured capacity building programs of educators at a local level. It was therefore of interest to determine how schools are implementing the intended curriculum, especially in geography, for the benefit of the environment and future generation.

- Different regions of Namibia have different environments and diverse cultures of the society. Without the approved EE policy for the Education sector, it was therefore critical to learn how schools coordinate EE activities at the local level and the extent to which the national curriculum/syllabus is prescriptive or flexible in allowing educators to integrate aspects of their local environment without compromising the quality of education.

- The implementation of EE requires a re-orientation in the approaches to teaching, learning and assessment, if educators were to spearhead the processes of change. Guidelines for continuous assessment tasks, particularly the use of criterion reference methods to assess the learning process is explained in the curriculum documents but structured programs to build the capacity for educators was not done.

- Though materials on environmental learning were produced and sent to schools, it was important to understand how these materials had impacted on educators and learners' perception of their environment, teaching and the learning process.

The aim and objectives of the study are given in 1.4 below.

1.4 AIM AND OBJECTIVES OF THE INVESTIGATION

The aim of the research was to determine how schools in the Caprivi region implement environmental learning in Geography Grades 8-10, with the objective to:

- determine the extent to which Geography educators have the knowledge and understanding of environmental learning curriculum for geography Grades 8-10;
- determine the extent to which environmental learning processes, strategies and assessment are implemented through Geography in schools;
- determine the level and nature of environmental skills and attitudes which Grades 8 – 10 learners require, as seen from the educators' perspective;
- explore the extent to which outdoor activities complement the overall objectives for Geography for Grades 8-10;
- determine understanding and perceptions of Geography educators with regard to the significance of indigenous knowledge as a resource in the school curriculum;
- explore the extent to which learners understand their environment, environmental issues and the learning process;
- determine the presence of school environmental policy and how it is applied in schools;
- determine the level of support which schools obtain from stakeholders such as parents, government departments, NGOs and other members of the community concerning the implementation of EE programmes at schools;
- make recommendations on how to implement and support EE schools and share the findings with other stakeholders in education and environmental learning area.

1.6 RESEARCH METHODOLOGY

The research design is a mixed methods research approach, which includes aspects of the quantitative and qualitative approach. The purpose of mixed methods research is to build on the synergy and strength that exists between quantitative and qualitative research methods in order to understand a phenomenon more fully than is possible using either qualitative or quantitative methods alone (Gay, Mills & Airiasian 2006:49). The data was gathered by means of self-evaluation instrument/survey questionnaire for educators, interview schedule for Geography educators/teachers, a focus group discussion for learners and interview with the local Environmental Education officer (from Ministry of Environment and Tourism).

The study was conducted in the Caprivi region, Namibia. Five (5) schools participated in the study. Schools were chosen according to urban, peri-urban and rural criteria. Participants in the study are educators for Geography in Junior Secondary schools. In addition, the self-evaluation instrument/survey questionnaire for educators was sent to all forty seven (47) schools in the region with Grades 8-10. The regional director of education was consulted in advance about the research and its purpose and permission was sought from school principals.

1.7 BRIEF DESCRIPTION OF THE AREA UTILISED FOR THE STUDY

The Caprivi is located at 16 degrees south of the line of equator, with high temperatures and much rainfall during the December-to-March period, making it the wettest region of Namibia. Caprivi is surrounded by 4 perennial rivers – Chobe, Kwando, Linyanti and the Zambezi. It is the only region surrounded by four countries in SADC. The terrain is mostly made up of swamps, floodplains, wetlands and woodlands. The annual flooding in the past ten years has led to migration of thousands of people from flood prone low lying areas to higher grounds and that has created stress on pastures and other natural resources, especially if left unchecked. This may lead to land degradation (possible bush encroachment) as the result of overgrazing, deforestation (fuel wood, building materials, clearance for fields) and drought. It is also home to 450 animal species, including elephants making Caprivi a popular game-watching spot. The wildlife is protected by several nature reserves, such as Bwabwata, Western Caprivi game park, Mamili/Lupala national park, and many conservancies such as Salambala. People of the Caprivi region practise subsistence farming (crop and cattle) and there is human-wildlife animal conflict in other areas. According to the Education Management Information Systems (EMIS) of Ministry of Education, the Caprivi region has forty seven (47) schools with Grades 8-10. Thirty eight (38) schools are rural, four (4) are peri-urban and five (5) schools are urban.

1.8 DEFINITION OF KEY CONCEPTS

There are a number of key concepts used throughout this dissertation and explained below:

1.8.1 Subject syllabus

Carl (1995:37) defines a syllabus as systematic selection and organizing of subject knowledge from a specific area of knowledge. It is here that a more detailed indication of what aspects of a subject or an area of knowledge should be presented. The curriculum content in the syllabus, therefore, complies with the specified standards and requirements and is chosen in accordance with the particular level of development and intellectual ability of learners. In brief a syllabus also describes the content of a programme and can be seen as part of the curriculum. MsKimm (2007:3) argues that most curriculums are not developed from scratch and all operates within organisational and social constraints.

1.8.2 Geography

Geography is a study of the earth, and the interaction between humans and nature. It examines humans in their interdependent relationship with the earth. Geography also studies ways in which humans have adapted nature to meet their needs and requirements, and to what extent humans are able to utilize their environment in a sustainable manner (Opie 1995:58) and (Namibia 2006:3).

The above information affirms that Geography provides scientific knowledge about physical, environmental and human processes, which forms the basis for cross-curricular education. Geography promotes the following aims in the curriculum guide: intellectual development, personal development and self-fulfilment, social and cultural development and development of environmental and population awareness. Thomson, Bailey and Howes (1990:1) are of the opinion that “Geography encourages the awareness of the world. It implies awareness that there are other people in the world besides those in our immediate environment, and there are different environments with high or lowland, plains or forests, town or country – awakened to the world”.

1.8.3 Competencies/learning objectives

Learner-centred teaching processes use a broad range of knowledge and skills which are relevant to the knowledge-based society. The basic competencies in the Namibian school syllabuses state what understanding and skills a learner must demonstrate as a result of a teaching-learning process, and which will be assessed. However, it is intended that the curriculum is learning-driven, not assessment and examination driven. Assessment and examinations are to support learning. Carl (1995:107) states that, a learning objective is an objective which is formulated in such a way that it clearly spells out the expected learning profit on the part of the learner: that which the learner should be able to do/know at the end of the lesson.

1.8.4 Sustainable development

Historically, development and conservation have been understood as separate or incompatible. Conservation was seen as the protection of resources and development as the use or exploitation of resources. Recognizing the need for both, the United Nations appointed, in 1987, a commission on environment and development to advise on development and conservation. In the commission's report, called The Bruntland Report or Our Common Future, the concept of sustainable development was emphasized. The report defined sustainable development as 'development which meets the needs of the present without compromising the ability of the future generations to meet their own needs. The above definition is supported by Nederlanden (2000:13) who define sustainable development as a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations. Huckle and Sterling (1996:2) added that sustainable development means improving the quality of life whilst living within the carrying capacity of the supporting systems while De Haan (2010:318) re-emphasises the need to achieve greater inter- and intra-generational justice. Each generation should leave to the future a world that is at least as diverse and productive as the one it inherited (Schnack & Jensen 1997:35). In summary, sustainable development is an on-going, comprehensive social process of change and design that makes it possible, both to provide for the current generation's quality of life and safeguard future generations' own life options.

1.8.5 Indigenous knowledge

Indigenous knowledge (IK) is the local knowledge that is unique to a culture or society. Other names for it include: 'local knowledge', 'folk knowledge', 'people's knowledge', 'traditional wisdom' or 'traditional science'. Adora Hoppers (2001:10) describes IK in the South African context as referring to that system of knowledge in philosophy, science, technology, astronomy, education, mathematics and engineering that is grounded on total cultural heritage of a nation or society, and maintained by communities for centuries. This knowledge is passed from generation to generation, usually by word of mouth and cultural rituals, and has been the basis for agriculture, food preparation, health care, education, conservation and the wide range of other activities that sustain societies in many parts of the world. Sophisticated knowledge of the natural world is not confined to science. Human societies all across the globe have developed rich sets of experiences and explanations relating to the environments they live in.

These 'other knowledge systems' are today often referred to as traditional ecological knowledge or indigenous or local knowledge. They encompass the sophisticated arrays of information, understandings and interpretations that guide human societies around the globe in their innumerable interactions with the natural milieu: in agriculture and animal husbandry; hunting, fishing and gathering; struggles against disease and injury; naming and explanation of natural phenomena; and strategies to cope with fluctuating environments. There is controversy about the measure of defining poverty which originates from World Bank thinking which is a particularly limited to view of economics.

1.8.6 Assessment

Assessment refers to measuring - formally/informally, observation/oral/practical/written - the learning achievements of a learner or learners. Hungerford (2001:179) upholds that assessment is used so broadly that it is often used to indicate the use of formal and non-formal data gathering procedures and combining of data in a global fashion to reach an overall judgement. According to Mutasa and Wills (1994:190) assessment is the process by which the quality of an individual’s work or performance is judged.

1.9 SUMMARY

Environmental education is presumed to have a political support through a number of environmental related international treaties and protocols which Namibia has signed and ratified since independence in 1990 such as the Convention on Climate Change (1992) and Combating Desertification (1994). The constitutional provisions and national policies provide a legal framework from which contested environmental issues can be resolved. It also lays the foundation from which all stakeholders are called to participate in actions and decisions necessary to improve the quality of lives of people and the environment.

On the national level, the National Development Plan (3) acknowledges the significance of sustainable development approach. Environmental education integration attempts were made (2003-2005) through the efforts of SEEN. The draft National Environmental Education Policy and the MoE's aims, provide a holistic conceptual framework for EE. Most of the environmental threats for Namibia are related to land degradation and loss of biodiversity, though environmental problems of a global scale such as climate change are gaining attention.

It is also evident that the issue of citizen participation through action-oriented projects, value development, integration of EE into the geography subject aims, learning content and approaches to teaching and assessment will receive the opportunity for research, especially in light of the recently revised curriculum (2006) for Namibia. The research, though limited to Caprivi region, will provide both theoretical and hands-on experiences from which educational stakeholders will be able to benefit by either improving their approaches or creating new research opportunities.

CHAPTER 2

LITERATURE STUDY

2.1 INTRODUCTION

The chapter introduces a brief explanation of the curriculum and environmental education as broader concepts. It also covers the international treaties and conventions binding Namibia to consider environmental and resource sustainability through political, social and economic aspects of development and education. These treaties include, but are not limited to the United Nations Convention on Biological Diversity (CBD), United Nations Convention to Combat Desertification (UNCCD) and United Nations Framework Convention on Climate Change (UNFCCC).

The Enviro Fact (January: 2001) points out that the successful enforcement of the conventions which followed international agreements and declarations is directly related to the economics, social and political context within which they are adopted. It is important to assess actions resulting from international agreements.

To conceptualize the significance of a holistic view of environmental education, a brief explanation on the dimensions of environmental learning will be discussed. A theoretical background on the nature of the cognitive and affective domain characteristics of 14-17 years old learners will be explained.

The national policy goals for 'Towards Education for All' and the underpinning educational philosophy referred to as 'the learner-centred education' in Namibian context, will be explained in order to demonstrate how environmental education should conform to the general policy theory and intended practice. The chapter proceeds with the theoretical framework on environmental education methods and processes, the position of junior secondary school geography in Namibian curriculum and the summary of the learning content for Junior Secondary (JS) curriculum for geography.Since many of the difficulties in the EE curriculum and implementation focus on values, the chapter will provide comprehensive information on value clarification methods in the study of EE and geography. EE integration models are explained and illustrated and the concepts of 'eco-school' and 'the whole school approach' to learning will be provided. Significant to the chapter will be the role of indigenous knowledge and local EE centres both in geography and EE.

Assessment will be approached in an integrated way by focusing on current practice as required by the geography syllabus and international trends involving transformation towards authentic assessment in environmental education or education in general.

2.2 UNDERSTANDING CURRICULUM DEVELOPMENT PROCESSES IN NAMIBIAN CONTEXT

In general terms, the concept of curriculum includes the explicit and implicit overall and underlying theories, policies, and principles for intended learning and teaching, as seen in official statements and actual practice. Carl (1995:31) refers to the concept of curriculum as coming from the Latin word 'curro' and refers to the race track. Reference is therefore made to the educational track on which learners move under leadership of their educator on the way to adulthood. The curriculum is seen as the sum total of the means by which a learner is guided to attain the intellectual and moral discipline required to play the role of an intelligent citizen in a free society. McKimm (2007:3) define curriculum as "the totality of experiences of each learner under the influence of the school or a planned system of instruction". In simple terms, the curriculum in the Namibian situation is derived from aims, goals and key skills for a knowledge-based society. The aim of basic education for the future of society is to provide a caring, healthy, democratic, productive, and environmentally sustainable and information society. The nation expects learners to develop core skills in order to be competitive and prepared for the world of work and challenges. These core skills are: learning to learn, personal, social, cognitive, communication, numeracy and information and communication technology skills.

All learning areas and subjects in the National Curriculum for Basic Education (2010) policy document contribute towards achievement of the core skills articulated through school phases. The broad curriculum provides guidelines for curriculum developers and implementers because it clarifies policy issues, give direction and the envisaged outcomes reflected in actual subject syllabuses for different grades (depth, sequence and articulation). Avenstrup (1997:21) recommends that curriculum should not be seen as an end point, but as a turning point in the continuous process of the reconstruction of knowledge and society. This is the view of curriculum as seen from the perspective of the so called Progressive Education Movement represented by the ideas of John Dewey in the USA.

In addition one can also say that the curriculum should also provide a ground for individual opportunity and social improvement. This suggests that individuals are provided with the social power and the intellectual insight necessary for problem solving. This is what Schiro (2008:149) could support to explain the significance of social reconstruction ideology. Within the national context, curriculum review and innovation should be informed by the imperatives of our social, economic, cultural and political environment. Namibia follows a spiral approach in syllabus development where different grade levels and phases are progressively linked.

As a document, a curriculum is an overall specified course of learning. The Namibian curriculum (including school subjects) is usually stated in terms of:

- rationale and aims for the course as a whole and particular basic competencies to be achieved. These are often categorised under knowledge/with understanding, skills/basic competencies and attitudes/values;
- Themes, topics and prescribed time allocation;
- intended learning experiences and how educators can facilitate them;
- how learner achievement will be assessed.

Avenstrup (1997:5) is of the opinion that "one of the challenges which faces African curriculum developers is to find a relationship of school knowledge to society (real life), provide flexible life-long education and combine national framework with local variation". This is particularly a problem in Namibia because of the diverse nature of the country with a small population of two million. The curriculum development through decentralized structures requires capacity building if educators want to teach what is meaningful and relevant to their environment without paying lip-service to the quality education. Educators will need to be more self-reliant and independent in interpreting and delivering of the curriculum.

McKimm (2007:4) highlights that the process of learning is as important as its products and as educators we need to be aware of both formal and informal factors which impact on learning. In Namibia, though the broad curriculum and subject syllabus development is coordinated by the National Institute for Educational Development (NIED), the process is participatory in the sense that the work is done by experts who constitute Subject Curriculum Panels.

These are experts representing the curriculum developers, examination officials, advisory teachers, and universities, colleges of education, experienced teachers, trade unions and people from the world of work across the country. This is supported by Howard (2007:3) who advocated the notion of the curriculum as a social process in which personal interaction is important. One of the challenges is the complexity of inclusive nature of curriculum development and keeping Namibian education on line with regional international trends in education.

2.3 WHAT IS ENVIRONMENTAL EDUCATION?

Environmental education is an educational process dealing with the interrelationships among the natural world and its man-made surroundings. It is experienced based, interdisciplinary in its approach and is a continuous, lifelong process that provides the citizenry with basic knowledge and skills necessary to individually and collectively encourage positive actions for achieving and maintaining a sustainable balance between man and the environment (www.jefferson.k12.us/Departments/environmental). If we look at the above explanation, EE is better understood as a process of change across individuals' life spans. It is not limited to one school subject in the curriculum but a cross cutting process creating the possibility for people to take collective actions which leads to improvement in living standards of the people and health of the environment.

Environmental Education is therefore a process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among people, their culture and their biophysical surroundings. The environmental dynamics and cultural diversity demands that people should participate in decision making and the self-formation of codes of behaviour about issues concerning environmental quality. "Our Common Future" suggests that education should provide comprehensive knowledge, encompassing and cutting across natural sciences, social science and humanities, thus providing an insight into the interaction between natural and human resources, development and environment (WCED 1987:45).

Bornman (1997:3) contends that "the environmental education, as defined at the Tbilisi Conference, greatly differs from environmental studies which dominated amongst school practices for many years. The subject environmental studies was aimed at transmitting knowledge about the environmental, whilst environmental education is seen to play a wider

role". This can be understood if we interpret environmental issues as both education *about, through* and *for* environment. This integrated nature of EE provides the opportunity for individuals to develop knowledge with understanding, action skills and values.

2.4 INTERNATIONAL TREATIES SUPPORTING ENVIRONMENTAL EDUCATION

2.4.1 Stockholm (1949) and Tbilisi Conference (1977)

Wickenburg (2000:12) quotes from the official document by the Swedish Foreign Office, Series II: 25 that "from the education perspective, it is recommended that the different UN departments, particularly UNESCO should attempt to set up an international plan for environmental education. It is emphasized that education shall be interdisciplinary, holistic, life long process and pertains not only to the formal school system, but also to heighten the consciousness of the general public". This means that the international community has made a commitment by empowering the UNESCO department to seek new ways to improve the further education of specialists and technicians on environmentally oriented subjects. A guideline on the conception of EE is provided.

UNESCO (1995:13) notes that education should be easily adaptable to sudden shifts in conditions in a world of swift changes. This indicates that environmental problems are dynamic. The society expects a school curriculum in which learners can develop appropriate skills and attitudes which contribute to the health of the environment and improves the standard of living of people. It should prepare the individual for life by raising awareness of today's great global problems. People should contribute individual skills and attributes to be able to play a productive part in the employment of improving the standards of living and caring for the environment, with application of ethical values. Hungerford (1998:343) proposes that environmental education should work to develop a citizenry that is knowledgeable about the bio-physical environment, its associated problems and an awareness of how to help solve these problems.

What is apparent in the international declaration (Tbilisi) is the re-emphasis of Stockholm decisions. The further focus is on dynamic threats and challenges which should considered globally while acting on a local level (McLuhan in Nederlanden 2000:7). This suggests that individuals should understand how actions of people in other parts of the world affect everyone and how their actions on a local level can contribute towards environmental solutions.

The physical and man-made environments are intimately interdependent (Palmer 2003:10). This view of the environment must draw individuals into a process of active problem solving within the framework of defined realities. It also stimulates initiatives on the basis of taking responsibility for and involvement in the shaping of a better tomorrow. We could see how the Tbilisi declaration ties well to what later become the Dakar (1989) principles of Education For All (EFA). The Tbilisi principle impact on education for Namibia because it offers opportunity for learners to:

- understand the nature of environmental risks and challenges they face;
- know how they will impact on our society and on the quality of life of our people now and in the future;
- understand how these risks and challenges can be addressed on a national and global level;
- understand how learners can play their part in addressing these risks and challenges in their own school and local community (Namibia 2006:4).

2.4.2 Rio summit (1992)

Agenda 21, Chapter 36, strongly emphasizes that "education is the deciding factor for the promotion of sustainable development and improving the individual's ability to solve environmental and developmental problems". It is therefore important to raise the consciousness of the significance of the environment and ethics, values, attitudes, aptitudes and behaviours compatible with sustainable development, and to give the general public the opportunity to partake in the decision making process. Tarr (2000:64) supports the core value of participation and action by noting that at the 1992 Earth Summit in Rio, it was decided that in order to tackle the global waste problem, for example, all efforts should be made to reduce, reuse or recycle waste matter.

This can be supported by penalties on waste generation and reduction of reliance on virgin raw materials and fossil fuels. In order to be effective, education about the environment and development should include the dynamics of the physical/biological, social and economic environment as well as human development, and be included in all subjects and scientific fields.

In light of above statements from the Rio summit it is noted that EE has now two purposes: to enable the general public to take part in a democratic decision making process (which is a constant notion of empowerment, central to Agenda 21) and also to provide the general public with the skills and knowledge necessary to be able to act in an environmentally conscious way, in a manner compatible with sustainable development. The core theme of education for sustainability includes lifelong learning, interdisciplinary education, partnership, multicultural education and empowerment. Priority should be given to ensuring women's and girls' full and equal access to all levels of education, training and decision making (MacDonald 2005:47). This signifies that formerly disadvantaged groups of the community should be included in EE programmes.

The follow-up international policy document published by UNESCO (1995) in Wickenburg (2000:16) views the teaching process as resting on four main pillars:

a) learning to know
b) learning to do
c) learning to be
d) learning to live together

As a programme of action in environmental learning, Palmer (2003:35-53) identifies the following key global environmental issues: population growth and poverty, food and agriculture, tropical forests, biological diversity, desertification and drought, fresh water, oceans and coasts, energy, atmosphere and climate, managing solid waste and sewage, hazardous substances and global security (most of these issues are covered in chapter 3-33 of the Agenda 21 and the framework for action is outlined in the document). These issues are relevant to most developing countries such as Namibia. For EE initiatives to succeed the Namibian government should at the national level develop an enabling environmental policy framework within which both regional and local activities can flourish. It is worth noting that Namibia has a draft National EE policy.

Chapter 36 of Agenda 21 was dedicated to 'Education, public awareness and training'. Key programme areas included the re-orientation of education towards sustainable development, increasing public awareness and promoting training. This included endorsing the recommendations of the World Conference on Education for All, *which included environmental literacy* (Jomtiem, 1990), ensuring environmental education and training in all sectors of society, increasing access to environmental education and training; and promoting environment and development concepts in all education programmes. Governments were required to update or prepare strategies aimed at integrating environment and development as cross-cutting issues into education at all levels.

Van Rooyen (2006:127) is right to submit that better environmental learning models ensures that citizens take responsibility for what happens in their community – politically, socio-economically and also environmentally. A primary educational mission should be to teach citizens to exert influence in public affairs in a democratic way (of which environmental issues are surely an integral part). On a national level, the roles of the following major groups need to be strengthened: women, youth, indigenous people, NGOs, local authorities, trade unions, business and industry, farmers and, scientific and technological communities. In Namibia, the Namibia Environmental Education Network is a coordinating body for environmental initiatives.

2.4.3 World Summit on Sustainable Development (Johannesburg 2002)

In an attempt to provide a ten year review of developments since Rio, the UN General Assembly convened a World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa from 26 August – 4 September, 2002. The Summit in Johannesburg took place in a context where there was an increased realization that countries are inter-dependent regardless of the income levels (following the terrorist attacks of 11 September 2001 in the USA). Global inter-dependence is also a key characteristic of globalization. In the past two decades there has been a rapid development of information and communication technologies and this had an impact on EE initiatives.

The World Summit on Sustainable Development, according to Lotz-Sistka (2004:16), took place in a context characterized by:

- globalization: MacDonald (2005:1) explains that the term globalization is often used to describe the rapid movement towards an integrated market, but the economic activity is not the only global phenomena. The depletion of the ozone layer was the first environmental issue for which an international accord was struck;
- awareness of some of the shortcoming associated with the implementation of Agenda 21;
- increased commitment to sustainable development and poverty alleviation (as articulated in the Millennium Development Goals of 2000); and

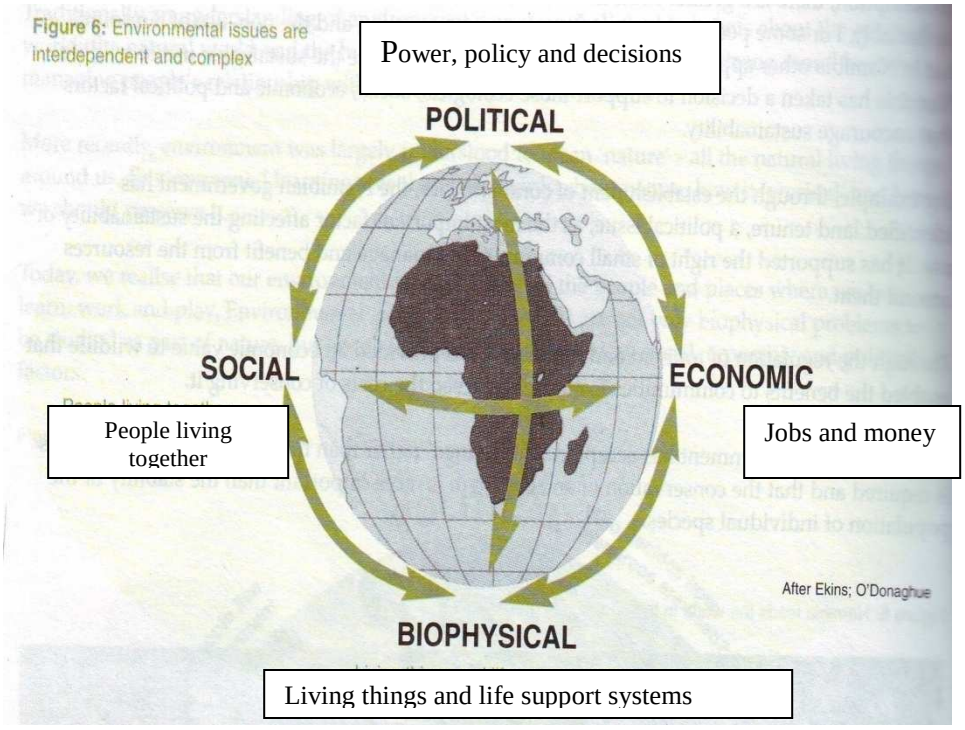
The WSSD Implementation Plan recognizes that education is critical for promoting sustainable development. The document calls on governments to:

- integrate sustainable development into education systems at all levels to promote education as a key agent of change;
- incorporate ESD into global plans for providing 'Education for All' (as outlined in the Dakar Framework for Action) and the Millennium Development Goals; and
- provide all members of society with a wide range of lifelong learning opportunities in ESD (Tilbury 2003:111).

UNCED (2002:2) advocates that education is critical for promoting sustainable development and improving the capacity of the people to address environmental and development issues. This implies that each country or region needs to develop policies, strategies and action plans including targets, indicators and division of labour in the work for Education for Sustainable Development. Lotz-Sistka (2004:23) and Hattingh (2002:5) observe that in 'interrogating' sustainable development discourse in a southern Africa context, sustainable development has become associated with a modernist moral imperative. This entails that adaptive moral and environmental values are crucial in order to achieve sustainable living.

2.5 DIMENSIONS OF ENVIRONMENTAL EDUCATION

The paradigm of thought in environmental education has changed over the past three decades. Currently, Environmental Education involves the bio-physical, economic, political, and socio-cultural dimensions of life (Janse van Rensburg & O'Donoghue 1995; Palmer 1998). The diagram below shows the interconnectedness between three dimensions of environmental learning.



Source: Namibia (2005:8)

All elements of our environment are related to each other as shown by arrows. This suggests that dimensions or elements that make up the environment are interlinked. If one dimension of the environment is affected, many other dimensions may also be affected. The relationships may not be easily understood as they are complex.

The biophysical dimension is placed at the bottom of the diagram representing the thought that all dimensions are supported by and thus rely on the biophysical dimension. If the biophysical is affected, effects on many other dimensions will often result.

It is therefore extremely important for us to ensure that the biophysical environment is looked after, as it is this dimension that sustains all life on earth. The roles of other dimensions broaden the concept 'environment' to more than just natural environment. Hungerford (2001:71) asserts that "as learners analyze and evaluate the complexities of an environmental issue they begin to understand the intricacies of the connections that they could not have discovered if information was presented fact by fact and subject by subject outside of the context as a whole". Environmental education is best taught if it is conceived in a holistic way.

The Environmental Education Association of Southern Africa (EEASA, 2002 Annual Conference, 19-21 August, Gabion, Botswana) identifies a number of the socio-ecological issues that need urgent attention. Biophysical issues include water scarcity, pollution, loss of biodiversity, degradation of life support systems and food security. The social issues include urban drift and poor living conditions, conflicts over resources, access to jobs and epidemic diseases, especially HIV and AIDS. Economic issues are those linked to development and poverty. These include the inequality gap – human development index dropping despite economic growth in other countries, economic mismanagement, excessive consumption patterns and consumerism replacing broader social values among sectors of the society. Political dimensions include despotism, corruption and decisions leading to expenditures such as military. People are exploited for political gains and oppressed to force them to marginal land. Huckle and Sterling (1996:54) caution that educational institutions need to be reoriented towards helping learners learn systemic, future, integrative, problematic, creative, values analysis and moral reasoning.

2.6 AREAS OF ENVIRONMENTAL LEARNING

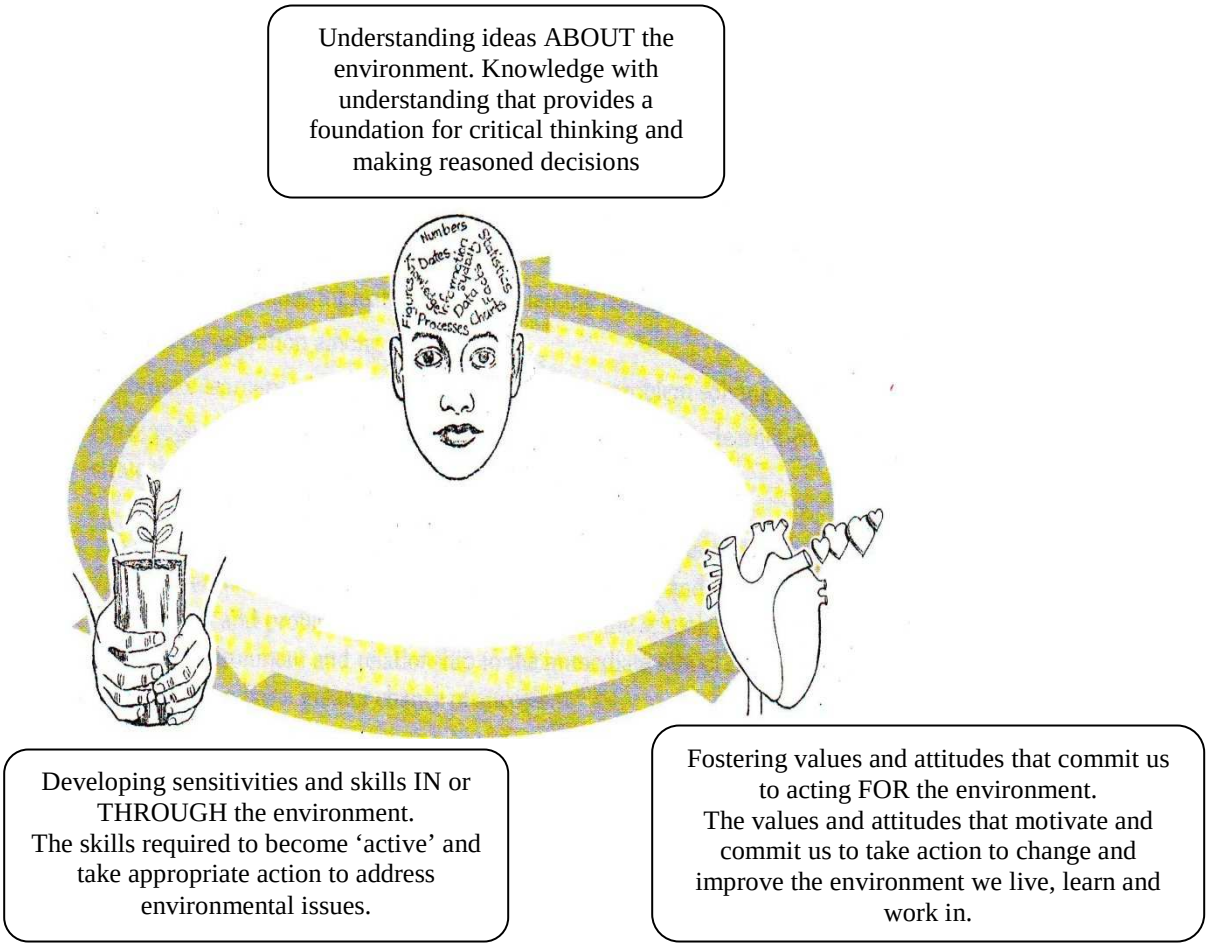
One way to become environmentally literate was first suggested by an Australian educator, John Fien (Fien 1993:12). He noted that this would involve: Learning ABOUT, IN/THROUGH or FOR environment. These parts can be thought of as the head, hand and heart of environmental learning. Just as in a person, the 'system' is most effective when all three are working in harmony together. What are implications for this to a school life?

- Learning ABOUT the environment involves developing a sound base of knowledge with understanding so that learners can make sense of environmental issues. Knowledge with understanding about the environment enables learners to critically evaluate issues and situations in light of the informed understanding (Palmer 2003:143, and Schnack & Jensen 1997:20). Understanding of human and natural processes is a foundation for individual and group awareness of EE issues. Du Toit & Squazzin (1999:13), however, contend that integration of social and natural system is ignored and traditionally environmental education is seen as 'part' of science and geography.

- Learning IN or THROUGH the environment provides experiences that play an essential part in learning, whether at school, in a city street, a beach, a park, farm or forest (Schnack & Jensen 1997:20). They provide a stimulus for learning a wide range of skills needed to identify and explore environmental challenges. Through this approach, EE provides opportunities to learn out–doors and enables learners to develop skills for data gathering such as observation, sketching, measuring, interpreting, photography, interviewing and social skills such as cooperation and appreciation.

- Learning FOR the environment involves developing informed concerns about, and encouraging a sensitive use of, the environment now and in the future. The aim is to promote willingness to adopt life styles that are compatible with the wise use of natural resources (Schnack & Jensen 1997:20 and Palmer 2003:144). Previously school-based learning in Namibia emphasized the 'about', occasionally provided opportunities 'in or through' the environment but encouraged few actions 'for' environment.

- Learning should clearly link with the development of attitudes and values, including elements of and reflection of human understanding and behaviour necessary for the development of sustainable living patterns and caring of the planet and its resources. Education for environment may be located within the socially-critical traditions in education because of its concern for social critique and reconstruction. The diagram following summarises three main areas of environmental learning.



Source: Namibia (2005:11)

From the diagram, it is evident that the three dimensions are equally important.

Hungerford (1998:343) believes that environmental behaviour is associated with components such as personality factors (attitudes, locus of control, efficacy perception, personal responsibility); knowledge of issues, knowledge of action strategies and action skills; intention to act and situational factors (constraints and opportunities).

This implies that learners should be active participants on different levels, including the possibility of involvement in preventative diplomacy before the society faces financial and human costs of environmental destruction. Wickenburg (2000:88) informs that environmental teaching has changed from the study of, in, and for the environment to the expression learning for sustainable development, looking at wholeness of what man, using technological aids, creates in nature and society. This means people should consider for example, issues such as environmentally friendly building designs and sustainable consumption patterns. Van Rooyen (2006:129) summarizes that "education *for* environment seeks to help learners develop skills needed to identify, investigate and take actions towards the prevention and resolution of environmental issues". This requires a wide range of knowledge, skills, values and action objectives which cannot be addressed by simple environmental facts and concept or experiential learning in nature.

2.7 BRIEF BACKGROUND ON DEVELOPMENTAL (COGNITIVE AND AFFECTIVE) STAGES OF 14-17 YEARS OLD LEARNERS AND HOW IT RELATES TO ENVIRONMENTAL EDUCATION

Pearson Longman (2006:865) defines learning as "to gain knowledge or skills by study or experience or being taught". Learners at 14-17 years old, usually in grades 8-10 are in Arlin's fifth Piagetian stage (Wisconsin DPI 1994). Learners should be able to investigate, analyze issues, synthesize information collected, and evaluated both the issue and various alternatives. This is supported by Schiro (2008:117) who propose that educators should stress the following when applying Piaget's theories in a school: learners need to learn through experience, need cognitive conflict as part of the process of equilibrium, learners need an environment in which they can pose and test their questions and learners need to be helped to construct relationships between objects.

Hungerford (2001:123) submits that "in the ninth through twelfth grades, environmental education can promote active and responsible citizenship by challenging learners to hone and apply problem solving, analysis, persuasive communication and other higher level skills – often in real-world contexts". Learners must be able to think critically, debate and identify the ecological consequences related to the issue and proposed solutions.

In-depth knowledge and perceptual awareness should be given minor emphasis because environmental issues are dynamic. Hence, in order to keep up with ever changing

information, participatory research and investigation is often desirable. Doll (1989:252) suggests that learning in Dewey and Piaget's vision becomes a by-product of inquiry. This means the teaching should involve some discovery learning so that learners can learn to solve problems on their own. The educator must provide learning materials that are interesting, challenging and sustain learners' curiosity as they search for solutions. To support, Schiro (2008:125) observes that "children go through the process of rediscovering meaning and reconstructing their conceptual structures continuously over an extended period of time as they learn about their world and themselves and reconcile new information with past meanings".

Environmental ethics should still be given a major emphasis. Learners should be using critical reflection and judgement to determine what is desirable, and have increased ability to 'reason'. The facts should lead towards active participatory learning both in the field and the classroom; towards the development of self-motivated investigation and study of the environment and debate about current relevant national and global issues.

Elliot and Katochwill (1996:35) believe that cognitive growth depends on children's interactions with those around them and further stressed that Vygotsky's and Bruner's argument is that culture shapes cognitive development by imposing its symbolic systems on the child's developing mind. This suggests that the power of social-cultural and environmental factors has an influence in determining how learners perceive, interpret EE or interact with the natural environment.

Goals for curriculum development in environmental education according to Hungerford (2001) are:

Goal level III: Investigation and evaluation level.

Goal level IV: Environmental Action Skills level: training and application. This level seeks to guide the development of those skills necessary for learners to take positive action for the purpose of achieving and/or maintaining a dynamic balance between quality of life and the quality of the environment. Goals at this stage level are presented in two components:

Level IV Component A. The goal is to develop in learners those skills which will permit them to effectively work for the environment. This should be consistent with their values to take individual or group action when appropriate, that is, persuasion, consumerism, political action or eco-management.

Level IV Component B. The goal is to provide learners with opportunities to: a) make decisions concerning environmental actions strategies to be used with respect to particular issues, for example, population and sustainable development; b) apply environmental action strategies to specific issues, that is, to take citizen action on one or more issues and c) evaluate the actions taken with respect to their influence on achieving and/or maintaining a dynamic balance between the quality of life and the quality of the environment.

Cooney, Cross and Trunk (1993:30) quoted Plato as saying "the environment of the cave and the binds which imprison its captives represent the chains of ignorance. In such a state, prisoners see only shadows and mistake them for truth. The release from these chains and the consequent ascent out of the cave is marked by many stages - none of them are easy. Becoming educated and enlightened is a difficult process. Breaking the chain of ignorance is often a painful task. Once out of the cave, the wayfarer again goes through stages of enlightenment - this marks the developmental process each individual will go through in true education. At the end of the process, the enlightened individual feels the moral obligation to return to the setting of the cave to help the other captives to release themselves from the darkness of ignorance". This signifies that the process of becoming environmentally literate will not be an easy one, but once literate an individual should contribute towards the process of learning to benefit all.

2.8 TOWARD EDUCATION FOR ALL: A POLICY GOAL FOR NAMIBIA

Lotz-Sistka (2004:52) notes that "the World Conference on Education for All (Jomtiem, Thailand, 1990), World Education Forum (Dakar, 2000) and Millennium Development Goals (MDG) marked a start of global quest to universalize basic education and to eradicate illiteracy". Namibia as a member of the international community ascribed to the above international treaties and obligations. In Namibia, this means all citizens (young and adults) should have access to information leading to environmental literacy and knowledge on causes and alternate solutions to EE issues.

There are four major policy goals of education in Namibia, that is, access, equity, quality and democracy. 'Access' means not only having all children attending school, but also making knowledge and understanding accessible for them (NIED 2003:5). Knowledge and information can be accessible to learners through well structured learning activities where learners engage with each other and with the learning support materials. Gultig, Hoadley and Jensen (2004:9) remind us that "providing wide spread access to high level of skills and knowledge was the only way to achieve social transformation". Equity refers to redressing the past inequalities, particularly in terms of race, gender and social class where there can be overt prejudice or assumptions. In this context it is proposed that racial or gender based EE practices which are destructive to the environment should be redressed.

Because of historical reasons, schools in Namibia are characterized by disparities in terms of availability of physical and human resources. Graves (1998:123) refers to Agenda 21 that "being historically responsible for the articulation of the Survival Strategies for the families, women have always been very active in demanding improvements in their environments. However, many of them do not perceive themselves as in action in the environment field". Therefore the effective implementation of the curriculum should ensure mobilization of learners with learning difficulties, the girls and others from different social economic groups.

Quality is reflected in educators and learners using their own imagination and experience to design, construct and collect materials for exciting learning. "Our challenge ... is to develop instructional strategies that make it possible for learners from varying backgrounds and with differing abilities all to progress. More than anything else, it is the educator who structures the learning environment to the needs, interests and ability of the learners in their classes" (Towards Education for All 2003:39-40).

According to Higgs (2004:104) ‘quality’ has become to many a rather irksome issue in discourses on education in South Africa especially where demands for higher academic standards become barriers to access to education at all levels. This suggests that the move towards education for the masses may put strain on available resources and compromise the quality of education. Quality of education can be measured by, among others, what learners can do (skills and values) after completing a learning programme. Democracy refers to active processes in schools. “To educate about democracy, our educators and our education system as a whole must practise democracy…educators must be active creators and managers of the learning process not its masters or caretakers” (Towards Education for All 2003: 41-42). This clearly implies that the goals of education should not be determined solely by outside experts without personal reference to the central role played by the individuals making up the community of learners. Life-long learning is a concept which has come to the foreground during the 1990s.

Namibia’s recent history (and on-going similar events in Southern Africa) implies that special attention should be given to the place of ‘democratic’ education. An important strand with environmental education is the notion that environmental problems cannot be solved through ‘action competence’ unless democracy is strengthened at every level. It implies therefore that the envisaged environmental education should be largely school based and context-specific allowing learners to explore issues about cultural identity, respect, society-nature relations and social and environmental equity. It is about creating possibilities rather than defining the future. A central pillar in environmental education is not so much what you do, but why and how you do it. How far are learners involved in decisions? To what extent are the actions responding to the interests, ideas and values of learners and the community?

2.9 UNDERLYING PHILOSOPHIES BEHIND LEARNER CENTRED EDUCATION (LCE) IN NAMIBIA

The LCE approach in Namibia is in an African context which embraces diversity, but which is emerging from a colonial past where ethnic difference was deliberately perverted and negatively exploited (NIED 2003:17). It is described in the Ministry's policy documents, curriculum guides and the conceptual framework. This approach ensures optimal quality of learning when certain principles are put into practice. The aim is to develop learning with understanding, and the skills and attitudes to contribute to the development of society. The starting point for teaching and learning is the fact that the learner brings to school a wealth of knowledge and social experience gained continually from the family, the community, and through interaction with the environment (Swarts, Dahlstrom & Zeichner 1999:250; Adora Hopper 2001:2). The learning environment should create a possibility of this learning experience to unfold. Learning in school must involve, build on, extend and challenge the learner's prior knowledge and experience (Ornstein & Hunkins 2004:117; Hungerford 1998:151).

The teaching process which ignores and does not build on lived experience will limit the learner's thinking, and the learner will not see the connection between the world outside school and what is taught and learnt in school. The school is only part of the total learning context of the learner. According to Kitchenham (2008:112) the transformation of meaning or sets of meaning schemes involves a comprehensive and critical evaluation of oneself.

Learners learn best when they are actively involved in the learning process through a high degree of participation, contribution and production. The learner must engage himself or herself in internalizing and reshaping or transforming information through active participation. At the same time, each learner is an individual with his/her own needs, pace of learning, experiences and abilities. Teaching strategies must therefore be varied but flexible within well-structured sequences of lessons. Graves (1998:350) is of the opinion that social constructivism is based on the two main prepositions: "knowledge as constructed by the organizing subject, not passively received from the environment and coming to know is an adaptive process that organizes one's own experiential world". Work in groups, in pairs, individually or as a whole class must therefore be organized as appropriate to the task in hand. Co-operative and collaborative learning which promotes peer interaction and dialogue should be encouraged wherever possible.

Du Toit, Squazzin and Bjerg (2000:19) note that "in order to understand something, we need to explore the context within which meaning arose". In such cases, tasks must be designed so that pair or group work is needed to complete it, otherwise the learners will not see any relevance in carrying out tasks together. It also implies that learners should be probed to give reasons why they hold certain environmental views. This is supported by Kitchenham (2008:113) who contends that when a person begins to interpret new meaning perspectives and meaning schemes, the discussion with peers provides an ideal vehicle for learning.

Schnack and Jensen (1997:135) maintain that environmental education is broadly defined as a process that enables learners and educators to participate in the planning, implementation and evaluation of educational activities aimed at resolving an environmental issue that the learner has identified. The crucial factor in LCE articulated above is the importance of ownership of EE activities by learners through a high degree of involvement. Cooney, Cross and Trunk (1993:40) quote Confucius, the master educator, as saying "I am not the one who was born in possession of knowledge; I am the one who is in fond of antiquity and earnest in seeking it there". This suggests that educators are co-learners and should be reflexive practitioners. Role plays, simulation games, school-community improvement and projects where learners participate are highly recommended.

Van Harmelen and Wilmot (2001:38) conclude that the role of educators and learners in the teaching and learning process is radically different from that which traditionally has dominated. It includes the following dimensions:

a) the educator acting as a facilitator as s/he creates opportunities for the learners to access and articulate their prior knowledge;
b) the educator in critical engagement of the learner with their pooled knowledge in order to both increase the collective understanding, and to correct misconceptions through a process of deconstruction;
c) the educator as a scaffolder, in that through demonstration, modelling, transmission, or any other strategy the original construct is developed and the construction is revisited ensuring that the learner has internalized the new knowledge and it has become part of their 'lived experience'. This involves gathering of evidence to see if they understand the new knowledge through demonstration.

A basic tenet of learner-centred education is that each learner should be empowered to learn to the best of his/her ability. Because of Namibia's historical past, this also means that special attention should be given to girls, minority groups and other learners with learning difficulties.

According to Fullan (2007:291), the goal of public schools in the 21st century must be to serve successfully 95% of the school population.

2.10 ENVIRONMENTAL EDUCATION METHODS AND PROCESSES

Trends in environmental education have largely been influenced by the broader debate and challenging philosophical views of schools and education. Firstly, the view of the 'environment' expanded to include the social, political, economic and biophysical. More recently there have been moves to include an 'orientation to action' termed 'action competence' that acknowledges that the inclusion of facts about the environment and explorations in the environment, while important, are insufficient by themselves for facilitating a process of change. O'Riordon (1981:7) cautions that "deep ecology is the essence for environmentalism and it is best demonstrated by exposing both educators and learners to the contradiction between belief and action that beset us".

The aim of EE is to engage learners as active and responsible citizens, both in school and out of school learning initiatives. Such participation according to Fullan (2007:180) is essential for helping learners to make the link between school learning and daily life in order to understand the role and responsibilities of active citizen within a democratic society. Democracy encompasses values which promote respect for human dignity, equality, social and environmental justice.

The other approach of learning in EE is to bring practioners to the classroom and stage a panel discussion amongst learners. This has the merit of stimulating debate so that arguments and counter-arguments can be thought through. The serious setback to the approach is that discussions rarely change any ideological position and skilful speakers can sway an audience, even if the facts and interpretations that lie behind them are challengeable.

Grayford and Dillon (1995:175) mention that in a study of educators on environmental education, the following concerns were raised:

- the breadth of environmental education and the fact that compared to many other areas of the curriculum it can seem unfocussed, particularly since it includes much that relates to beliefs, values and attitudes;

- the methodologies and approaches suited to environmental education are generally not well developed in comparison with other subject areas and there is lack of consensus of what might be considered good practice;
- the possibility of environmental education being a form of indoctrination. Given the importance placed on values and attitudes in relation to the environment and this is compounded by the fact that good deal of discussion about environmental issues has obvious political implications;
- the use of traditional methods of assessment, which are seen as inappropriate, given the nature of the area of education, and the absence of alternate approaches.

Hungerford (1998:343) goes further and argues that not only has responsible environmental behaviour been considered a goal for EE, but that 'involvement' in such activities has often been identified as a goal for EE. So what are the approaches favoured within Namibian environmental education? These approaches are situated within the broad school of thought labelled 'social constructivism' and take their cue from learner-centred education. They all share a number of features such as learner choice and negotiation; the incorporation of reflection and reflexivity within the learning (and teaching) process, an emphasis on critical thinking with the context of active real-life. This extends to what De Haan (2010:319) refers to as situated learning. Most of them follow an investigative or problem solving strategy in which learners:

- identify a learning theme – this could be around and environmental theme (World environment day), a local issue (deciding to manage wildlife), a risk or problem (malaria, unsafe place);
- find out more about the causes, symptoms, extent, location and effects relating to the theme – either through surveys and field visits, sharing existing information or researching secondary evidence;

- evaluate information, consult interested individuals and groups and identify possible solutions from different perspectives;
- select an action and develop a plan;
- if feasible, help to implement plan and monitoring its effectiveness in order to amend or change it and reflect on the outcome of investigation.

Supporting this view, Ornstein and Hunkins (2004:187) assert that "the task of critical pedagogy is to bring members of an oppressed group to a critical consciousness of their situation as a beginning point of their liberatory praxis". This implies that constructive critical discussions and debates have the possibility to unpack and demystify misconceptions of the people as far as contested environmental issues are concerned. Agreements as well as differences between situations should be illustrated with a view to promote comparison. It should be noted that individual differences influence learning and the group atmosphere created after critical debates is a necessary measure of success. This is also supported by Kitchenham (2008:108) who asserted that the highest level of 'critical transitivity' is reflected in individuals who think globally and critically about their present conditions and who decide to take action for change.

Graves (1998:152) points out the significance of networking among educators and other practioners, that it actually reinforces non-hierarchical, democratic and a collaborative way of working which is the hallmark of environmental education. Networking at different levels creates an opportunity for resource sharing, a synergy, corroboration and coordination between stakeholders.

2.11 GEOGRAPHY AND ENVIRONMENTAL LEARNING

Geography is an environmental study par excellence. Within its disciplines, maps are the most distinctive and particular means by which geographers express themselves, setting out facts and suggesting explanations. Maps of all kinds represent environmental relationships, past and present, direct and indirect (www.ngeo.com/xpeditions/standards/matrix/html). World thematic maps in atlases may be thought of as environmental summaries, records of the stages reached in different parts of the world by these many processes working in combination to produce the conditions of human life and work.

The skills developed through school geography courses include systematic observation and recording, especially in the form of maps. It includes their interpretation, the use of photographs and satellite images by older learners. Photographs in geography and environmental learning can be very important forms of evidence of negative or positive environments during enquiry teaching approaches. Learners should have skills, competencies and knowledge to change economic, ecological and social behaviours without merely being a reaction to existing problems (De Haan 2010:320). They should be at all times proactive. This extends to what is expected from learners in EE, that is, enquiry into local EE issues. Local surveys which sharpen learners' observations of environmental quality are very important. These kinds of enquiry can lead into discussions about who might make improvements and the likelihood of any suggestions being accepted and carried out.

Graves (1998:192) suggests that environmental education and geography should make references to economic causal analysis, social effects and organized political action in the content and learning activities. To summarize, it is worth mentioning that people use environments in a number of ways. Thus, they create varying cultural landscapes through different patterns of human activities. On one hand, they are influenced by their physical settings, but on the other, they are transforming their surroundings into different culturally created environments, including landscapes of harmony and landscapes of conflicts. Understanding these complex interactions within space provides an important basis for responsible environmental planning, management and protection.

Namibia's Initial National Communication to the United Nations Framework Convention on Climate Change (Ministry of Environment and Tourism 2002) reveals that Namibia contributes little global warming gas emissions. Instead, Namibia is estimated to be a net sink for carbon dioxide in 1994, as a result of increasing woody biomass in the rangelands, due to process of bush encroachment. In 1994, the greenhouse gas emissions from Namibia were 5 614 Gg CO2 equivalent, excluding the sink described above. Transport sector is the greatest emitter of CO2 (about 50% of the total) because of the great distances travelled in order to distribute goods and services. Enteric fermentation in cattle and sheep contributes 98% of the CH4 emissions. Emissions of NO2 are small and mostly derived from burning in Savannas.

All aspects of geography draw together under this heading and one is reminded that human actions are inescapably related to the well-being of the natural world. Lotz-Sistka (2004:6) estimates that southern Africa is a home to 291 million people, of which 75% live in rural areas, and a very large proportion of these people are dependent on the natural resources for their livelihood. In junior secondary school geography in Namibia, the link between the size of population and degradation of natural resources through pressure on carrying capacity is emphasized.

2.12 POSITION AND AIMS OF JUNIOR SECONDARY SCHOOL GEOGRAPHY IN THE NAMIBIAN CURRICULUM

The Junior Secondary phase extends the learners' knowledge and skills, strengthens their values and attitudes and prepares them for continued studies and young adult life. This phase provides learners with the opportunity to explore a wider range of subjects to enable them to make informed subject choices for future career opportunities. It is more challenging and a greater body of knowledge is mobilized to develop a higher level of understanding and skills. The curriculum becomes more diversified as learning areas are broken up into more separate subject disciplines, and a degree of choice is introduced.

The medium of learning (except in the mother tongue/predominant local language subject) continues to be English. The Natural Sciences are separated into Life Science and Physical Science, and the Social Sciences into Geography, History, Life Skills, and Religious and Moral Education. In addition Arts in Culture, Physical Education, and Basic Information Science are offered. At this stage, learners' ICTs skills are consolidated in order to be able to learn independently and collaboratively, and to do research using ICTs. The element of choice is introduced in the pre-vocational area, where learners choose any combination of two electives from the following: Agriculture, Entrepreneurship or Home Economy, depending on their interest and aptitude and what is available at the school.

According to Namibia (2006:1) the aims of the Geography syllabus are to encourage learners to develop:

a) knowledge with understanding of:

- the terminology, concepts and systems fundamental to a study of physical and human Geography;
- the relationships and interactions of people and their environment in response to physical and human processes, as well as aspects of the changing world;
- a sense of place and relative location on a local, regional and global scale, with special emphasis on Namibian examples;
- HIV and AIDS and its impact on social–economic development.

b) an awareness:

- of the characteristics and distribution of a selection of physical and human environments;
- that on earth and also in our country there are different ways of life, and this should lead to a positive attitude towards this diversity;
- of the factors that cause change in the diverse environments;
- of sensitivity to gender issues

c) an appreciation of:

- the potentialities and limitations of the physical environment for human activities;
- how human activities can lead to environmental problems and improvements;
- the environment and the need for conservation.

d) Geographical skills to be able to observe, collect and represent data, analyze and interpret data, and present findings. (Information Communications Technology [ICT] should be used if available and applicable).

2.13 SUMMARY OF THE LEARNING CONTENT AS ADAPTED FROM GEOGRAPHY GRADES 8-10 PHASE SYLLABUS (Namibia 2006:7)

THEME/TOPIC	GRADE 8	GRADE 9	GRADE 10
Map work	Graphs Types of maps Location (degrees, minutes) 8 division of directions Map scale Distance Contour lines	Graphs Map symbols Location (degrees, minutes, seconds). 16 division of directions Distance Contour maps Photographs	Graphs Interpretation of human and physical features on map Location (degrees, minutes, seconds) Distance and scale Photographs Contours Cross-section Interpolation of isolines
Climatology	Weather instruments and data Forms of condensation Climatic regions	The atmosphere Weather instruments and data (graphs) Synoptic maps Precipitation Climate of Namibia	Weather instruments and data (graphs) Climatic maps Air pressure systems and movements Local winds Synoptic weather maps
Astronomy	Galaxies Solar system Moon	Movement of the earth (day & nights, seasons, tides) Eclipses Time	-------
Economic Geography	Economic activities Labour Resources (renewable and non- renewable)	Development Production Trade Income Aid	-------
Regional Geography	World map (continents, major rivers, mountains, deserts) Southern Africa (physical) SADC. Namibia	--------	Namibia: Physical features: physiological regions, drainage, vegetation, climate. Economic activities: agriculture, fishing, mining, transport, tourism. Factors influencing economic growth. Regional position: SACU and SADC.
Geomorphology	--------	Internal structure of the earth Basic types of rocks	Internal forces: Plate tectonics, fold mountains, Earthquakes and volcanism External forces: Weathering Erosion
Population Studies	--------	Population data Population characteristics Age-sex structure, population growth and movement Impact HIV and AIDS	Population density and distribution Population dynamics: age-sex structure, growth, migration. Benefits and challenges of population change. Strategies to reduce the impact of HIV and AIDS.
Settlement Studies	Concept and hierarchy of settlement. Characteristics of rural and urban settlements Problems in rural and urban	-------	------
Ecology	-------	--------	Deterioration of Namibian environment: causes of deforestation, desertification and bush encroachment. Land, water and atmospheric pollution Population growth and resources Possible solutions

It should be noted that environmental learning opportunities exist on topics such as climatic regions (processes of deforestation, overgrazing and desertification involved), renewable and non-renewable sources of energy, settlement studies and related environmental problems, population studies, agriculture, mining, tourism, fishing, transport, bush encroachment and forms of pollution. Lochner and Stols (2007), Van Rensburg (2006), Neethling-Bruwer (2007) and De Klerk (2005) make several points and explanations on themes covered in Geography grades 8-10 phase syllabus for Namibia. In fishing for example, learners could learn that natural processes and human activities have the greatest biological impact on marine environment.

It should also be acknowledged that the conceptual and skill development for grades 8-10 has a foundation in environmental learning from Upper Primary level subjects such as Natural Science and Health Education and Social Studies. There is also immense contribution from junior secondary phase subjects, among others, such as Life Science, Agriculture, Physical Science and History. JS Geography syllabus prepares learners for two year course for Geography in senior secondary, and to some extent Development Studies.

2.14 VALUE CLARIFICATION METHODS AS LEARNING ACTIVITIES

General value systems involve principles of what is right and wrong, widely acceptable by all people, acceptable to individuals and social group (Triebel in Higgs 2004:133; Opie 1995:18). General values can also be attributed to dominant culture. They are not specific and may cut across disciplines, too. Specific values are targeted values which an individual requires e.g. a community's way of relating to the environment. Environmental education, for example, promotes positive values and attitudes towards the environment and this is essential if learners are to value it and understand their role in safeguarding it for the future.

Schnack and Jensen (1997:35-37) remark that “we can’t have a commitment to democratic citizenship and not respect and value young people and listen to their understandings and views”. This leads to an understanding that learners feel empowered after being part of a cooperative learning group. There are a lot of benefits for learners’ participation in group-work activities. Learners will begin to ask more questions and think of alternative approaches to EE issues and take informed decisions. Gaining validation from a group's positive response makes the individual more likely to invest in taking the risk of further group involvement. One positive outcome of group participation is the unlocking of the individual's self-reflection and self-critical tendencies. Hungerford (2001:126) stresses that environmental issues arise when individuals or groups disagree that there is a problem or disagree what should be done about the problem.

In ESD, it is critical that educators understand the process of how learners come to learn in order achieve sustained change in behaviours and life styles. It is therefore appropriate to teach learners how to identify the values of others, especially during the process educators call ‘issue analysis’. According to Du Toit, Squazzin and Bjerg (2000:18), the learner makes available for scrutiny his/her systems of meaning within a particular learning situation. These systems of meaning are challenged, renegotiated and perhaps reconstructed according to information and understanding within a group. This is supported by Kitchenham (2008:113) who asserts that meaning becomes significant to the learner through critical discourse with others.

Hungerford (2001:127) unveiled a research finding that "an important factor in whether an individual will engage in environmentally responsible behaviour is that person's 'locus of control' or feeling of effectiveness". This means a person with an internal locus of control feels that s/he has a measure of control over events which occur. A person with an external locus of control believes that control over what happens is beyond his or her grasp. Locus of control may be influenced when a learner learns and applies citizenship action skills. Locus of control may become more internal when learners have had an opportunity to apply skills successfully in the community.

Gultig et al (2004:159) explain their pedagogical objective stating that "learning programmes should promote learners' ability to think logically and analytically, as well as holistically and laterally". This may include an acknowledgement of the dynamic, contested, and changing nature of knowledge, and of the need to balance independent, individualised thinking with social responsibility and the ability to function as part of a group, community, or society. Sustainable living requires active participation, environmental and social advocacy.

The role of the educator in the situation of 'multiple systems of meaning' is not to provide the 'right' answers or condemn 'wrong' ones but rather to challenge the doctrine of thinking, question values and attitudes and raise for discussion the consequences of holding particular views. Environmental hazards are a result of collective decisions. It is, therefore, not possible to isolate certain individuals as being responsible – we are collectively responsible for our actions. Fullan (2007:43) concludes that the purpose of a mind-changing encounter is not to articulate your own point of view but rather to engage the psyche of the other person.

2.15 ENVIRONMENTAL EDUCATION AS A CROSS-CURRICULAR OPTION

There is a tendency to assume that EE will require a significant allocation of curriculum time. This assumption is based on the view of EE as an 'add-on' and thus extra curriculum load. However if one approaches environment as a sensitization and strengthening focus, within the curriculum, that adds relevance and offers possibilities of (re) orientation then perhaps these perceived limitations can be overcome. Bornman (1997:51) cautions that "for many years, environmental education in schools was treated as belonging to geography, biology and other natural sciences.

Thus, the learners did not grasp the complexity of this field of study – the physical, biological and social interrelatedness of the environment".

A range of curriculum development models has been described by environmental educators. Palmer (2003:27) and Wickenburg (2000:12) quote the Stockholm, Belgrade and Tbilisi Conference laying down the global consensus that environmental learning is best achieved through an inter-disciplinary approach. Here we explore only three possible options:

a) 'greening' the existing curriculum;
b) 'thematic' approach;
c) integrated curriculum action.

2.15.1 Greening the existing curriculum

This is adding environmental information to existing subjects or learning areas. For example:

- using environmental texts in language;
- a lecture on a biodiversity issue in biology;
- using environmental example in mathematics.

This approach is sometimes referred to as 'infusion' into the curriculum. Hungerford (2001:115) refers to infusion as a process in which the educators carefully analyze existing courses for places where environmental content and associated skills could be incorporated. There are many ways in which the process is undertaken but some common issues are worth considering. Conceptualizing the process as 'bringing environment in' as opposed to identifying ways in which environmental issues are already integral to the particular subject can be problematic. This often leads to trivial curriculum activities: using a poem on nature, a classroom lecture on biodiversity or calculating the height of a tree. These activities are often based on narrow views of environment and draw on limited teaching methods.

According to Van Harmelen and Wilmot (2001:5) the Curriculum 2005 for South Africa reflects environmental learning in Social Sciences and Natural Sciences as leading to an understanding of the interdependence of and interactions between society and the natural and physical world.

Lotz–Sistika and Raven (2002:65) also emphasize that the Curriculum 2005 introduced 'environment' as an organizer in the curriculum, enabling environmental focus across different learning areas. The recognition that environmental issues are already integral to a particular subject might bring about a more fundamental reorientation to that learning area. In this case, EE audit in Geography may focus on determining what already exists rather than what is supposed to be in the subject syllabus.

Languages are expressions of social beliefs and value orientation, including deeply held cultural views regarding the environment. Another dimension of environmental education in Geography is the opportunity to investigate environmental issues on a local level and report environmental problems and solutions. This may involve, for example, critically analyzing media messages using environment as a sensitizing focus, articulating and reporting EE issues. This is supported by Huckle and Sterling (1996:114) echoing that "nature and tradition have to be reconstructed by a new conservative radicalism which offers people security by stressing repair, conservation and care".

2.15.2 Thematic approach

Using this approach educators or other curriculum developers focus on a theme or topic such as 'water' or 'litter' and then use the theme within and across the different subjects. This is to some extent a response to the acknowledgement that environment is a cross-curricular concern that requires an integration of learning across the different subjects or learning areas. Gayford and Dillon (1995:174) and Van Rooyen (2006:127) argue that environmental education has been identified as having an essential contribution and treated as both a cross-cutting and a unifying element of the school curriculum. This suggests that geography teachers could for example use a water audit to teach about water pollution while the educator of English might use the concept of pollution to teach about awareness creation and the dangers of pollution to health. Because environmental issues are complex, they may be difficult to fully understand if looked through the eyes of one subject area only. Environmental issues cut across traditional subject's boundaries and in order to understand them we need to identify these links and use them in planning themes and issues for teaching and learning.

In a research on EE integration in a new school in Canada, Samuel (1993:27) reveals that "educators had discovered that EE was best implemented by integrating it where it fit in the curriculum rather than devoting a special unit to it – not being overt about it but doing concrete, practical things that resulted in obvious accomplishment. Educators found that focusing on awareness and responsibility for the immediate environment, including the school and grounds, and acting as role models for the learners were effective ways to promote environmental values". The local environment in this way becomes a resource.

2.15.3 Integrated curriculum approach, issues approach

This approach places a greater emphasis on the contextual relevance of the theme, the integration between educators/subjects and the importance of encounter-dialogue-reflection within the framework of action. Using local environmental issues as a focus for teaching and learning has a number of advantages:

- they are real;
- they are relevant and important;
- they are 'right there';
- they provide a clear focus and therefore enable a purposeful inquiry;
- they encourage exploration from a range of perspectives;
- they are opportunities for learning about compromise and for developing skills to deal with conflict;
- they provide opportunities to involve people from the local community such as planners, councillors and parents;
- they offer opportunities for meaningful action-taking and critical reflection.
  (adapted from Chambers 1995)

2.16 THE ECO-SCHOOL AND WHOLE SCHOOL APPROACH TO ENVIRONMENTAL LEARNING

Local Agenda 21 led to the development of eco-schools in Europe. By raising learners' awareness of environmental issues, eco-schools are a flexible way to deliver EE through classroom study and apply this to the day-to-day running of schools. It also encourages environmental responsibility both at home and in the wider community. Eco-schools bring together learners, educators, local government and other members of the community such as industry. The framework is practical application of Local Agenda 21.

Van Harmelen and Wilmot (2001:5) emphasize that the "whole-school approach to environmental learning is participatory but again cautioned that the implementation requires good time-tabling, structured scheme of work and has implications on the school's view of assessment". This suggests that educators require proper capacity development if the concept of "whole school" development is to succeed. Through eco-schools and whole school approach, schools have considered the issues of transport, noise, nature and biodiversity, healthy living and the school grounds. As a process of facilitating sustainable development at a local level, learners are encouraged to take an action thus extending learning beyond the classroom and developing responsible attitudes and commitments both at home and in the wider community.

Successful schools are awarded a prestigious eco-label – eco-school green flag – to display in and outside the school. This flag, through its mere existence, raises certain expectations from the local community upon the school's environmental work. Eco-schools incorporate seven elements according to Wickenberg (2000:32).

a). *Establishment of eco-school committee*: The core of the eco-schools process is that the committee organizes and directs eco-school activities. The committee consists of the stakeholders of the school environment, namely learners, educators, cleaners, care-takers, parents and governors. The sense of democracy is involved and learners are motivated in the process of initiatives.

b). Environmental view: Work commences with a review or assessment of the environmental impact of the school. Learners are involved in the work, ranging from assessing the level of litter on the school grounds to checking infrastructures for inefficiencies.

c). Action plan: The information from the view is used to identify priority areas and create an action plan, setting realistic and achievable targets and deadlines to improve environmental performance on specific issues.

d). Monitoring and evaluation. This is to ensure that progress towards targets is followed, that any necessary changes are made to the action plan and that achievement is celebrated. Care is on-going process in the school.

e). curriculum work: Classroom study of themes such as energy, water and waste are undertaken by most learners. The whole school should be involved in practical initiative, for example, saving water, recycling materials and preventing litter. Where environment and sustainable development is not part of the curriculum, recommendations are made as to how this can be incorporated.

f). Informing and involving: This directly brings local Agenda 21 into schools, as local authorities, businesses and wider community is involved in the eco-schools process. Eco-schools are encouraged to make ties with external organizations in order to benefit from their experience and expertise. Eco-schools are also encouraged to consider the wider community when preparing action plans. Schools can keep the wider community informed of actions taken through classroom displays, school assemblies and press coverage.

g). Eco-code: Each school produces its own eco-code or statement of intent, outlining want the learners are striving to achieve.

The eco-school concept is not yet implemented in Namibia, but lessons from South Africa shows that the programme is supported by WWF-SA and Wildlife Environmental Society of South Africa (WESSA) with the endorsement of the Ministry of Education.

Eco-schools in South Africa are involved in activities which include, among others, saving of electricity, water, keeping the school ground clean, planting seeds, helping sick animals, health eating, audit biodiversity and surveys into home grown spinaches (http://www.wessa.org.za/index.php/Programs/Eco-Schools.html). This is supported by De Haan (2010:318) who maintains that sustainability is about intelligent forms of mobility and eco-friendly life-styles. Learners are therefore expected to contribute to the healthy of the environment both at school and in their community.

The opportunity for educators and learners to apply concepts and ideas from the EE to their every day life at school, home and community provides, according to Wickenberg (2000:33), several important benefits:

- improvements to the school environment e.g. reduction in litter and waste, fuel and water bill;
- creates a unifying sense of community and pride in the school;
- increases environmental awareness through curricular and non-curricular education;
- brings a sense of democracy to the management of the school in respect of decisions that directly affect the learners;
- provides learners with the education and tools to take decisions on environmental issues for themselves;
- fosters relationships and improves the language skills through communications;
- involves the local community, gains business support and local publicity.

A whole school approach also implies that more than just the educators are involved. Educators ultimately control the pace and direction of change and have the ability to obstruct or facilitate the wishes of planners. Much in environmental education can be conducted using outdoor education strategies, because it is often outside the classroom where environmental problems and issues exist. The whole school approach therefore gives learners the opportunity to learn in an enjoyable way while making a contribution towards understanding and solving EE issues.

The immediate school surrounding is usually shared by learners and parents, all of whom have an interest in and responsibility for this environment. The above is supported by Huckle and Sterling (1996:137) who argue that "the purpose of education is engagement – democratic, negotiated and pragmatic".

2.17 INDIGENOUS KNOWLEDGE AND ENVIRONMENTAL EDUCATION

Graves (1998:121) reports that the UNESCO General Conference in 1966 adopted the declaration of the Principles of International Cultural Collaboration which states: "Each culture has a dignity and values … Every people have the right and the duty to develop its culture… In rich variety and diversity and in the reciprocal influences they exert on one another, all cultures form part of the common heritage of mankind". Agenda 21 and the International Treaty between NGOs and Indigenous People (including The Voice of Eagle) illustrate the recognition of immense contribution that indigenous people, the communities and knowledge base can make to help achieve a more environmentally sound future (MacDonald 2005:137). In addition, Graves (1998:121) states that "development can be non else than pluralistic through an important process of innovation and perpetration in which cultures identify and human societies perpetuate their values with questioning, re-modelling and recreating them for both historical and social point". This indicates that the indigenous way of doing is not all detrimental but people can benefit from certain good practices in the struggle against environmental deterioration.

The National Curriculum documents (South Africa 2003a:9) articulates that "people should recognize the wide diversity for an African renaissance, including indigenous knowledge systems through which people make sense and attach meaning to the world in which they live. Indigenous knowledge systems in the South African context refer to a body of knowledge embedded in African philosophical thinking and social practice that have evolved over thousands of years". This is supported by Higgs (2004:107) suggesting that learners at schools and tertiary institutions should be culturally empowered so that they can again take pride in those cultures that have, for long, been regarded as inferior. The statement above signifies the importance of indigenous knowledge sharing, transfer and institutionalization so that future generation should also benefit from this treasure.

There are many examples of how people relate to the environment in a better way. The Ndebele tribe, being mainly cattle people, generally has limited knowledge of wild leafy vegetables compared to more sedentary agrarian tribes like the Shona and Tonga. Similarly, women tend to have more knowledge of leafy vegetables compared to men due to division of domestic chores (women being traditionally the cooks in the home), while men may be more versed with knowledge on indigenous fruits and edible roots.

The elderly are considered the repositories of indigenous knowledge and are usually more knowledgeable than younger age groups about wild food plants. This calls for coordination of EE activities with stakeholders e.g. parents and possible documentation and use of people's cultural practices at all levels. Adora Hoppers (2001:1) indicates that monitoring of the junior secondary certificate examination in 1993 (in Namibia) showed, for instance, that examination in the home science, arts and music subjects had a clear cultural bias towards urban living, European food and arts. There was nothing in the examination papers indicating that they were from Africa or Namibia.

Spiritual beliefs and values also contribute to environmental issues. For example, in Namibia, people collect certain plants and animal parts for muti, traditional and medicinal uses. Some of the plants they collect are endangered species or are at risk. One example is devil's claw (Harpagophytum procumbens). The plant grows in the Kalahari sands. Medicinal values for this plant have been recognized internationally so that huge amounts are now exported. In the 'Voice of the Eagle', the biodiversity issue is expressed through the importance of protecting, with respect, sacred plants used as medicines (MacDonald 2005:56). According to Kahn (2000:57) two of the national objectives by Riksdag (in Sweden) with regard to agriculture are that non-indigenous species and genetically modified organisms that may jeopardize biological diversity must not be introduced, and cultural heritage assets in agricultural be protected. IK in some countries such as India and China is seen as going beyond self affirmation or survival, to holding key to solving problems (Adora Hopper 2001:11).

According to the Gaborone Declaration based on the Proceedings of EEASA 2002 Annual Conference, 19-21 August, Gaborone, Botswana, the following were issues raised with regards to IK:

- traditional cultures are often romanticized or stereotyped;
- research on IK process is often conducted in insensitive ways;
- traditional cultures and knowledge is often commodified in ways that lead to trivializing, vulgarizing or degrading them;
- environmental learning processes often neglect to draw on indigenous knowledge and prior experience;
- sacred and guarded cultural knowledge should not be exploited for educational purposes.

There is a need for tolerance and a respect for diversity and recognition of the dynamic nature of knowledge and culture. In urban communities, knowledge on indigenous food plants is usually limited, particularly among those people who have been urban dwellers all their lives and have little link with the rural areas, and among youth and younger age groups. Adora Hoppers (2001:5) again draws attention to an important point that "an attack on organic relation and systematic devaluation of culturally determined ways of living constitutes 'cultural violence'. By cultural violence it entails getting subordinated groups not just to internalize but also to proactively endorse the illegitimacy of their own culture". In general terms, African children have much stronger connection with and identity rooted in their immediate community. You are a person through other people (the spirit of Ubuntu).

The African child experiences a stronger adult and older peer network around his/her upbringing (although not necessarily in terms of men and women sharing work in the home), and is carefully brought up to take on an increasingly active role in the community through learning what could be called the 'community curriculum' (NIED 2003:18). The school curriculum could integrate and implement aspects of heritage (cultural, intangible and natural) for the benefit of the new generation and the environment. Cultural heritage includes monuments, building and sites; intangible includes oral tradition, performing arts, social practices, festivals and knowledge of nature; and natural heritage includes natural features, geographical & physiological formations or natural sites.

2.18 THE ROLE OF LOCAL ENVIRONMENTAL EDUCATION CENTRES

In our school work, a love of life and of our fantastic world of nature is fundamental to environmental awareness. According to Horning, Lundberg, Olson and Malmberg (2001:69), learners can only acquire a more profound knowledge of and feeling for the environment by actively indulging in the sheer enjoyment of nature (all embracing experience). This means learners will be strongly motivated to defend nature's interest and to shoulder individual responsibility because of their experience in nature. There are 17 Environmental Education Centres (2 under the Ministry of Environment and Tourism; 5 under Ministry Youth, Sports, Culture & National Service; and 10 private centres), across regions in Namibia. The Namutoni Environmental Education Centre, for example, aims primarily to increase the knowledge and awareness of the diversity within, and fragile nature of the Namibian environment and to encourage and promote the sustainable utilization of Namibia`s natural

resources for the present and future generations. The objectives for the Ministry of Environmental and Tourism's Environmental Education centres are to:

a) increase the knowledge and awareness of the diversity within the fragile nature of the Namibian environment and to encourage and promote the sustainable use of Namibia's natural resources for the present and future generations;
b) influence people's attitudes, knowledge and behaviour;
c) deepen understanding and heightening awareness;
d) foster creativity as well as ingenuity;
e) build capacity among the Namibian youth to start taking the lead in sustainable environmental, social, and economic development;
f) share and develop skills for identifying, critically evaluating and solving environmental problems;
g) stimulate action education;
h) address the daily need for a change to a better environment for our future;
i) strive to achieve the objectives of Article 95 of the Namibian constitution; and
J) increase knowledge and awareness of the mission of the MET. (http://www.met.gov.na/namutoni.htm)

Target groups are usually invited to visit the EE centres such as Namutoni for 1-3 days. The programmes offered at the centres are designed to involve learners in "hands on" experiences with regards to the environment. Programmes can be adapted for the specific needs of a group. The programme and itinerary can be discussed with the education staff at the centres. This will ensure the smooth running of the programme and excursion. The centres lie in environments which are rich in diverse flora and fauna. Nature trails bring the visitor face to face with different ecosystems ranging from water plants and ferns to the dry camelthorn bushes. These ecosystems provide a rich haven for the scientific investigation of living and non-living organisms (birds and insects) in their natural habitat. Learners become acquainted with nature, engage in sharing of information with experts in conservation and get an opportunity to link what they learn in classroom to what happens in reality e.g. in subjects such as Life Science, Geography, Agriculture and Languages. (experiential learning).

2.19 THE ROUTE TO ASSESSMENT IN GEOGRAPHY AND ENVIRONMENTAL EDUCATION

In covering the Junior Secondary Geography syllabus, the educator should strive to place special emphasis on the local and regional aspects of the content. These local and regional aspects should also be reflected in the final examination. Burtenshow (1990:1) reminds us of the core of geography teaching from secondary level as follows: "geography is a perspective or a dimension of the study and a mode of enquiry about aspects of the world rather than a substantive body of factual material. It shifts the emphasis from content to the concepts, skills and techniques which may be considered essential and hence realistically to form the core of the subject." During the continuous assessment, including testing and setting examinations the following domains of learning will be covered (according to Namibian Phase syllabus for Geography grades 8-10): Knowledge with understanding, analysis, judgement and decision making and application of geographical skills.

2.19.1 Cultures of assessment

The practice of assessment both in psychology and education has been dominated by Western theoretical paradigms derived from a positivist and reductionist tradition and in particular the psychometric tradition exemplified by IQ tests. However the increasing awareness of the shortfalls of the traditional tests in terms of their being predictive, descriptive and prescriptive led to alternative ways being sought. There is a strong need for the nature of assessment which informs the learning process and which gives a holistic picture of how a learner progresses.

Race (2002:31) suggests the use of dynamic assessment, which recognizes direct measures of the learner's potential for learning and development and information on the processes that leads to the learner's success or failure. A qualitative type of assessment which can reveal things such as one's level of readiness, the learner's learning style or special aptitude is more beneficial to both the educator and the learners as compared to the traditional assessment. Van Harmelen and Wilmot (2001:14) emphasize that social constructivist epistemology, shapes much of the contemporary educational thinking and practice and is the position adopted by the Outcome-Based Education in S.A and Learner-centred in Namibia.

In environmental education, assessment is often based on awareness, values and attitude change, or measurement of reduced impact.

Behaviourist perspectives focusing on measurement and behaviour change within assessment has been challenged. Increasingly, it is argued that we should avoid too much of an emphasis on instrumental outcomes and broaden assessment focus to include assessment of developing competencies as this plays out in active learning process. The National Curriculum Statement for Grades 10-12 (South Africa 2003b:49) states that educators' assessment of learners' performance must have a great degree of reliability. Carl (1995:21) differentiates between summative and formative assessment that 'summative' is the summarizing evaluation which takes place at the end of instructional learning process while formative is ongoing assessment which may take place at one's discretion in the course of instructional learning process – the purpose is encouragement and feedback. In Namibia, the policy emphasises the importance of continuous assessment but the reliability remains problematic. Assessment monitors and supports learning. According to Ornstein and Hunkins (2004:352) and Schiro (2008:127) educators wish to gather data so that they can reason from evidence. This means that learner performance in C.A activities should enable educators to adapt learning support materials and adjust approaches to teaching in order to support a learner.

Positivism, education was thus viewed as a process through which we ensure that learners know more and the task of the educator is to ensure that learners acquire more and more information that experts have already discovered and categorised. The prime purpose of assessment is to test how much knowledge has been learnt. As educators we need to be cautious that schools should assess how learners progress or develop in terms of knowledge understanding and skill acquisition.

Wilmot (2003:4) reveals that during the past two decades, traditional assessment practices have been criticized as having led to situations in which:

- test and examinations are the most common tools for assessment;
- the focus is on measuring how much a learner is able to memorise and recall at the expense of developing conceptual understanding or knowledge with understanding , skills and values;
- there is a perpetuated myth of the 'right' answer, finding out how much learners know rather than how well s/he understands or can apply knowledge;
- key strategies include structured questions such as 'what', 'name', 'how many' where' as well as multiple choice answers;

- tests are used as one-off chances to show how much learners know;
- educators predominates, with everything that is not examined being disregarded and not worth knowing;
- examinations are negative because they lead to labelling.

The primary goal of the Namibian school curricula is to provide learners with a general education through which they develop skills or competencies, including inter alia, an ability to think critically and creatively, identify and solve problems, work independently and as a member of a group, communicate effectively, make decisions and collect, analyze and critically evaluate information.

The alternate, authentic forms of assessment attempt to address the shortcomings of traditional standardized tests. These approaches involve open-ended tasks that require learners to use their knowledge and skills to either create a product (design and construction) or solve a problem. Learners are engaged in activities that are of real world or resemble the real world (Ornstain and Hunkins 2004:352). In authentic assessment, learners will seek evidence of competence which learners have to demonstrate.

2.19.2 Continuous Assessment tasks for Geography grades 8-10

Assessment is at the heart of the learning process. It is not something that should be left to the end of the teaching process. Instead, assessment is integral to all parts of the education processes, continually providing both feedback and a basis on which to move forward. Assessment should not determine what is to be taught and learned. It should be a servant, not a master, of the curriculum. NIED (2003:30) argues that the examination system has not freed itself entirely from the former concept of the encyclopaedic curriculum and a narrower range of skills than the curriculum as a whole, because of the dependency on written examinations. This entails that assessment which is aimed at reproducing facts is not helpful. The assessment should be clear, simple and manageable and anchored firmly on learner-centred principles and authentic assessment.

Continuous assessment at Junior Secondary school level also consists of informal and more formal assessment. The Namibian Geography syllabus for grades 8-10 specifies how many formal assessments are required from practical exercises, projects, and end-of-term test, in order to give an overall picture of the learner's knowledge and skills.

Gayford and Dillon (1995:175) were right to be concerned that "assessment is seen as one of the main vehicles for raising educational standards. Consequently, there is a considerable emphasis on cognitive and skills related learning, which can be assessed relatively easy, with much less emphasis on affective aspects of education, including beliefs, values and attitudes, which presents considerable problem in assessment".

In Grades 8-10, continuous assessment in geography counts for 35% of the summative grade. Van Harmelen and Wilmot (2001:41) caution that "the problem is that traditionally summative, values, attitudes, conceptual understanding, cognitive and assessment expresses the norm as a single overall figure. It does not identify or distinguish between categories of learning, i.e. memorisation, communication skills, problem solving". Assessment should be understood by the learners and by the broader public. Assessment should be based on pre-set criteria of the assessment standards, learner-paced and fair, flexible and use variety of instruments and methods. There is an external examination in all examination subjects at the end of Grade 10. The purpose of the examination is to assess how far learners can demonstrate their achievement in reaching the competencies as a preparation for everyday life and for further studies or training, and to what extent the education system as a whole is enabling learners to achieve optimally.

Short tests assess assessment objectives such as knowledge with understanding of geographical concepts and processes, analysis and interpretation, judgement and decision making, and application of geographical skills. Ballantyne and Oelofse (1988) advocate that examination plays a major role in influencing what is taught and how it is taught in schools. In schools, examination results may encourage the nature of teaching approaches. Generally examinations encourage and reward the use of a conservative teaching style and teacher-centred methodologies in the classroom. Environmental education planners need to consider the impact of examinations upon educator support for, and implementation of, environmental education goals. According to Horning, Lundberg, Olsson and Malmberg (2001:68), the school work should lead to results which learners regard as meaningful instead of encouraging 'last minute' cramming for various examinations.

Tests are given after a protracted form of learning, that is, at the end of a unit of instruction eg. a topic like energy (Mutasa & Wills 1994:195). It is imperative that educators should be persuaded to include questions which test learners' environmental knowledge, attitudes, values and skills. Developing a learner's ability to think critically requires the educator to develop questioning skills for critical thinking, e.g. questions which asks, 'why', 'reflect', 'imagine', 'compare', 'predict', 'consider' and 'explain'.

2.20 SUMMARY

Namibia ratified most of the environmental education-related international treaties. The Ministry of Education's statements for environmental aims is rooted on Stockholm, Tbilisi and the Rio Summit/conference on EE. The chapter introduces a discussion on how the work of bodies such as the Brundt Commission, UNCED and others influenced or might influence EE. Recognition of indigenous knowledge in the curriculum and the country (Namibia & S.A)'s ratification of international conventions justify a political will. A convention is a common method of creating agreement for the environment. Such agreements are governed by international law. On the local level, the EE should be seen within multi-sectorial approach in which efforts can be pooled (synergy).

The key issues are the explanation of environmental education itself, the interdisciplinary nature of EE, life-long learning, thinking globally while acting locally, systems, interdependence of the living and the non-living, the physical environment and the built or designed environment.

It is also crucial that environmental issues are seen or interpreted through four main dimensions of environmental learning, which are: political, social, economic and biophysical dimensions. This enhances the opportunities for learners to develop an understanding of interdependent nature of the living and non living. The WCED (1987:9) notes that "in the end, sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are made consistent with the future as well as present needs.

The chapter also provides a picture of how environmental related learning should focus on three main areas of learners' development such as 'understanding ideas ABOUT, THROUGH and FOR the environment. This is crucial for the development of a holistic learner if our vision is towards concrete environmental actions. The characteristics of learners at junior secondary school requires learners to think on higher level of thinking (social critical), that is, to analyse and synthesize information, evaluate ideas, take action and show commitment to preserve and maintain the health of the environment.

The significance of language, cultural symbolic systems and identity demands greater degree of learner participation in environmental issues and involvement in participatory research. Environmental processes imply the use of various teaching methods to respond to differing environmental issues. EE cannot be considered as a 'thing, product or tool' to be applied to any situation. Educators and learners all bring knowledge and experiences to share.

The policy goals for Namibia require learners to have equal access to education, a core element in Jomtien declaration (1990), Dakar declaration (2000) and Millennium Development Goals (MDG). The participation of the girls, orphans and vulnerable children and minority groups is essential. The policy goal-democracy guides the process of teaching/learning and the school management envisaged. In social constructivist philosophy, learner's prior knowledge/lived experience and the role of educators as reflexive practioners are paramount in any successful learning. Learners should be the centre of activities. Learning should be situated in context of the learner's environment. Collaborative and co-operate learning is encouraged. Educators are viewed as facilitators and scaffolders. The skills of knowing how to work with constantly changing data, thinking critically and creatively, recognising how to work together on projects, tolerating ambiguity and persisting in the face of pressure are just a few of the new competencies that educators need to help learners to achieve.

The recent orientation in environmental education methods and processes, expanded the view of the environment through interacting political, social, economic and biophysical systems and the focuses is on action competencies or skills. There is a general tendency to move from learning mere facts to critical thinking. The Enviro Facts (December 1999) notes that through activities learners must become involved in the process of encounter (with nature, environmental issues, examples of solutions and ideas), - dialogue (developing understanding through discussion), and reflection (critically considering the issues, their history and solutions) and action research. Exploration of the biophysical geographical fieldwork, experience in nature and community problem solving forms the essence for environmental education curriculum at all levels. Various assessment tools, preferably criterion-referenced should be considered if learners are expected to show reliable evidence of learning. It is observed that examination driven curriculum, as opposed to continuous or outcome systems of educating, is not appropriate in modern educational trends.

Official documents on the constitution of continuous assessment marks are in principle, clear, but the implementation thereof is still to be investigated. Learner portfolios are regarded as important evidence for learning. It is also crucial that learners participate in self assessment, group and peer assessment.

Values related to appreciation of and care for the environment, independent thinking, respect and rational argument are critical for environmental education. It should be noted that societies are not homogenous and there is no universal approach to the earth's environmental problems. Values of biodiversity and natural resource are driven from many religious, spiritual, aesthetic, educational, recreational and cultural uses. Ethical dilemmas of resource management and conservation will always be complicated. Integration of a range of values from stakeholders is the way forward. Political history, awareness of traditional scheme and negotiated rules of conduct are paramount in any multicultural society. This requires new orientation to teaching and learning methods and expected community participation.

There is a need to strengthen infusion of EE in the curriculum as a cross curricular issue, not an-add on subject (as initiated by SEEN in Namibia and NEEP-GET in S.A). There is also a need for continuous professional development of stakeholders since EE has an impact on classroom practice. Of the many integration models discussed, Namibia, has to a large extent adopted, greening of the existing curriculum (infusion) which many countries in SADC followed. The illustration of how environmental topics/issues can be taught through interdisciplinary approaches call for a unified approach to teaching and assessment such as team teaching. Compartmentalisation of knowledge is not recommended as long as these dimensions and areas of environmental learning are taken into consideration.

Literature has also shown that learning can be enhanced by concepts such as the 'eco-school' or 'whole school approach' to environmental learning where learners, educators, local government and the members of the community are brought together. This links to the framework for Local Agenda 21.

It encourages learners to engage in a process of facilitating sustainable development at a local level because learners are encouraged to take actions beyond the classroom and develop responsible attitudes and commitments both at home and in the wider community.

Experience has shown that environmental learning is likely to be most successful when curriculum content is matched by the school's environmental practice and where work in the classroom is complemented by all aspects of the school's life.

Some of the curriculum issues from the Proceedings of the EEASA 2002 Annual Conference, 19-21 August, in Gaborone, Botswana were as follows:

- learning is often poorly understood by educators, leading to simplistic curriculum activities and narrow or prescriptive learning experiences;
- assessment practices do not support and enhance environmental learning;
- curriculum practices do not mobilize prior knowledge and experience (including indigenous knowledge) in the learning process;
- educators often lack the skills to implement action oriented, enquiry based approaches to learn.

CHAPTER 3

RESEARCH DESIGN

3.1 INTRODUCTION

The research design is a mixed methods research approach, which includes aspects of the quantitative and qualitative approach. The purpose of mixed methods research is to build on the synergy and strength that exists between quantitative and qualitative research methods in order to understand a phenomenon more fully than is possible using either qualitative or quantitative methods alone (Gay, Mills & Airiasian 2006:49). The qualitative approach will answer to the "how" question whereas quantitative answers the "why". By using the combination of two methods, the aim of a research is to describe and understand a social reality. Qualitative data can be used to supplement, validate, explain, illuminate or re-interpret quantitative data gathered from the same subject (Bodgan & Biklen 2007:41; Palmer 2003:104). However, the line between quantitative and qualitative methods is somehow blurred. This study involved the administration of a questionnaire (quantitative), which is followed by a number of detailed interviews and focus group discussions (qualitative) to obtain deeper explanation of numerical data.

The chapter will define the study population and give brief description of both quantitative and qualitative approach as used in the context of the study. Data gathering instruments such as a self-assessment form/survey questionnaire, interview schedule and focus group discussion will be explained. The approach to data analysis and interpretation, ethical consideration, validity and reliability and constraints will be explained. The population involved in this research will be described in 3.2 below.

3.2 POPULATION SAMPLE

The research population consists of all the units that we would like to actually observe in the research process (Johnson & Christensen 2004:196). The research population in this study were educators for Geography Grades 8-10, learners and a local EE official. In support, Neuman (2006:219) and Ruane (2005:43) affirm that the primary purpose of sampling is to collect specific cases that can clarify and deepen understanding so that the researcher learns about the processes of social life. The data was gathered by means of a self-evaluation instrument/ survey questionnaire for educators, interview schedule for geography educators/teachers, a focus group discussion for learners and interview with a local environmental education officer (from the Ministry of Environment and Tourism).

The study was conducted in the Caprivi region, Namibia. Five (5) schools participated in the interviews and focus group discussions. Schools were chosen according to the following criteria: urban, peri-urban and rural schools. Random numbers were assigned to schools in each category and used to select participating schools. This ensured that every school had the equal chance to participate. In addition, the self-evaluation instrument/survey questionnaire for educators was sent to all 47 schools in the region with Grade 8-10. The regional director of education was consulted in advance about the research and its purpose and permission was sought from school principals. The description of the two methods of research used in this study will be discussed in 3.3 and 3.4 below.

3.3 QUANTITATIVE RESEARCH APPROACH

The quantitative research is based on the idea that social phenomena can be quantified, measured (using various scales), summarized and expressed numerically (Bless, Hison-Smith & Kagee 2006:43 and Ruane 2005:14). The information about the phenomena can be analysed by statistical methods. A descriptive study establishes only associations between variables and can be well suited for comparison between groups or areas. Systematic changes in 'scores' are interpreted or given meaning in terms of the actual world they represent. In this study, predictors (independent variables) on the survey questionnaire were rural, peri-urban and urban schools, gender and years of teaching experience. This study was descriptive and correlational in that educators for all schools with Grade 10 rated themselves on 24 environmental learning practice indicators (dependent variable) which focus on knowledge, skills and attitudes, teaching/learning, resources, assessment and extra-curricular activities. Educators made further responses by ticking 32 other indicators on a nominal scale and these focused on environmental learning features in schools, school environmental policy issues, information sources and educators' training needs.

Ruane (2005:53) affirms that the numbers attached to the value of variables on a questionnaire indicate a ranking order of the value. In this study, a self evaluation questionnaire was mailed to schools and asked respondents to return it by means of the post-office (postal questionnaire). Data will be structured in the form of numbers. For an accurate estimate of the relationship between variables, a descriptive study usually needs a sample of many subjects. Data matrix is the starting point for analysis. It is thought that in gaining, analyzing and interpreting quantitative data, the researcher can remain detached and objective. One of the weaknesses of the approach is however that it simplifies and compresses the complex reality. It is however difficult to study processes or dynamic phenomena if the participants' intentions, 'meaning' are not considered.

3.4 QUALITATIVE RESEARCH APPROACH

The qualitative researchers do not narrowly focus on a specific question, but ponder the theoretical-philosophical paradigm in an inquisitive, open-ended settling process as they adopt a perspective (Neuman 2006:15). This suggests that the research is an interactive process in which steps blend into each other and a later step may stimulate reconsideration of a previous one. Qualitative research conforms to the constructivist view which holds that there are multiple versions of reality. The meaning is socially constructed during the process and it is conceived that there are multiple versions of truth and reality. According to Neuman (2006:329) and Bogdan & Biklen (2007:5) the qualitative research methods look for patterns in the lives, actions and words of the people in the context of the study. Each participant in the study has brought a set of ideas, circumstances and perspectives to the study providing a variety of versions of the experiences from the schools.

The constructivist paradigm incorporates the view of the researcher into the research as another voice in the project with an affirmative view of the situation. Syder, Angula and Makuwa (1999:93) and Bless et al (2006:44) profess that the qualitative work and linguistic symbols are relied upon to provide meaning to the data. This is supported by Neuman (2006:72) and Bogdan & Biklen (2007:5). The researcher in this study wants to understand the meaning people attach to their everyday lives. The researcher will find meaning as s/he analyses the data. The researcher must provide evidence of rich, detailed and textured descriptions to allow readers of the research to make connections between the ideas and their own experiences. This research, which is based on phenomenological study, draws from the experiences of educators, learners and an EE officer for schools under study.

The methodology of phenomenology is dialogic and hermeneutical which necessitates using in-depth interviews to elicit rich detail of the experience from the participants' points of view (Neuman 2006:90 and Bogdan & Biklen 2007:7). From examining the world of the study through dialogue, the researcher and participants give credence to each person's point of view. Each person's wisdom contributes to the experiences within the reality of the phenomenon. In this research project, the interviews were conventional and the relationship between researcher and participants developed during interviews. The established rapport necessitated the capture of information from interviews, and finally the seeking of affirmation from interviewees through checks that the words and ideas captured reflected the intent they wished to convey during the interview. Having discussed the significance of qualitative research in the study, the importance of how the data could be gathered in both quantitative and qualitative research will be discussed in 3.5.

3.5 DATA COLLECTION

Trochim and Donnelly (2008:142) note that qualitative data are those pieces of information which are non-statistical in nature (standards and values oriented research). Relevant curriculum and policy documents focusing on the environmental education curriculum and implementation at school level were scrutinised. The methods employed to collect data were the use of semi-structured interview questions designed to encourage participants to describe their experiences in implementing environmental education in the curriculum and the daily school life. This suggest that the central feature in research is to engage people in examining their knowledge (understanding, skills and values) and how they interpret themselves and their actions in social and material world.

In this study, interviews will give access to other people's perceptions and meanings in order to gain greater understanding of a situation. In order to gather data, multiple data collection instruments for educators, learners and EE officer will be used. LeBeau (1997:51) claims that qualitative data collection is more spontaneous, and data collection is in its natural environment or context. The instruments for this study were both qualitative and quantitative. The findings and analysis of the data are a result of triangulating the data from all instruments. According to Neuman (2006:149), triangulating data from the various instruments will be used to 'confirm' the findings and thus enhance their validity. In this study triangulation consists of a combination of a self-assessment instrument, interview and focus group discussion whereby data on the implementation of EL in Geography comes from three perspectives: educators, learners and an environmental education officer. Neuman (2006:312) and Gay, Mills & Airisian (2006:419) indicate that a pilot study makes it possible to do preliminary checks on the validity and reliability of questions. Instruments in this study were trial tested at a local school to determine if participants understood questions and amendments were made.

The following data collection instruments were used:

(a) **Self-assessment or administered survey questionnaire for educators**

Questionnaires were completed by respondents themselves, without assistance of the interviewer. The purpose of the self assessment questionnaire is two-fold: first was to give educators the opportunity to rate their own performance, knowledge and comfort level regarding environmental education; secondly, for educators to develop professionally by internalizing and recognizing the importance of indicators of sound environmental learning practice in the self-assessment in the hope that this will become normative behaviour in their teaching. According to Bless et al (2006:126), since respondents were asked to mail back the completed questionnaire without indicating their names, anonymity was assured and this helped them to be honest in their answer.

Furthermore, the findings from the self assessment instrument helped to validate the findings from interviews with educators in that the researcher could cross-reference the educators' ratings of themselves with what was said in the educators' interview. Ruane (2005:123) claimed that a good questionnaire can 'stand on its own' and enable the researcher to collect data without requiring personal contact with respondents. Each participating educator completed an assessment instrument by giving him/herself a rating of one (1) to four (4) for each of the twenty four (24) environmental learning practice indicators. The indicators were broken down into the following categories:

- Knowledge about environmental learning
- Materials and resources
- Skills and attitudes
- Teaching / learning and assessment
- Extra-curricular programmes

Educators rate their practice according to the following criteria:

4 = you are very confident about this indicator

3= you are confident about the indicator

2 = most of times you feel unsure about this indicator

1 = the indicator is seldom or never found in your classroom.

You feel very unsure.

Educators made further responses to 32 other environmental indicators on a nominal scale and these focused on environmental learning features in schools, EE school policy issues, information sources and educators' training needs.

b) Interview schedule for educators

Interviews were held with educators from a sample of five (5) schools. Information was obtained in a structured conversation in which the interviewer asks prearranged questions and records answers. Neuman (2006:305) and Bless et al (2006:116) support the significance of interviews. Bodgan and Biklen (2007:103) recommend that early in the interview, the subjects should be briefly informed of the purpose of interview and assure them that the interviews will be treated confidentially. In this interview, the areas explored are the same as those in the self-assessment, although more open-ended and the interview protocol were semi-structured. The focus was on teaching and learning, skills and attitudes, resources and extra mural activities.

Participants were contacted at least twice in order to establish the nature of the study, the role of the researcher and to collect information. Interviews were digitally audio recorded/taped, transcribed and a copy provided to each participant of his/her words and my interpretations so that each participant had the opportunity to review his/her interview responses after transcription and an analysis. This thus ensured that information was not lost and there is credibility of the study.

c) Focus group discussion for learners

According to Bless et al (2006:122), the focus group discussion refers to an interview technique where the researcher gathers together 5 or 6 people who are similar in some way and who have a specialized knowledge about the research topic. Once a group of people gathers together, the researcher leads (moderates) the group with directed questions that focus on the topic. The members of the group take turns answering and discussing the questions among themselves. The focus group fully recognizes the value of social interaction as an important source of data and understanding. LeBeau (1997:53) cautions that since there is a possibility for many people to talk at the same time, note taking for this type of interview is problematic and it is suggested that the researcher take notes and also digitally audio/tape records the session. The focus group was conducted in a semi-structured way.

The questions were based on learners' understanding of the environment, what they like and not like at school and the kind of environmental issues prevalent at school and the locality. They were also asked what teaching methods they enjoy best, including how classroom practice is linked to outdoor activities. The questions explored a variety of areas including learners' knowledge of environmental education, attitude towards the environment and how they felt about environmental learning in curriculum. The focus group discussion was digitally voice recorded/taped and transcribed. Transcripts were later reviewed with the interviewees to ensure credibility.

d) Interview schedule with local Environmental Education official.

This was based on opportunities and constraints which are related to environmental learning implementation in schools, networking, support and programmes. The interview was digitally voice recorded, transcribed and reviewed with the interviewee to ensure credibility. Data was clustered according to themes and coded for easy reference.

e) A collection of documents

Reviewing the accumulated knowledge about questions is an essential early step in the research process. Documents are past written and printed materials. They may provide the background information (Macmillan &Schumacher 2001). Document analysis is beneficial because it serves as a valuable supplement to interviews and observations. Data can be more credible than data collected in interviews or through observation because of the absence of a researcher effect on the data source- documents are non-reactive. The school EE policies and learners' exercise books were checked for evidence of teaching/learning and assessment tasks related to the Geography syllabus and EE.

3.5 DATA ANALYSIS AND INTERPRETATION

Analysis of data involves working with the data, "organizing it, breaking it down, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others" (Bogdan & Biklen 2007:159 and Neuman 2006:15). In quantitative research, charts and graphs illustrate the result of the research. Qualitative researchers analyze data inductively by categorizing and organizing the data into patterns that produce a descriptive and narrative synthesis. In this study, transcripts of interviews were typed out and individual thoughts and ideas of each participant separately numbered.

The statements of each participant were categorized. Statements were under headings specifying the ideas expressed and coded with respect to the research themes and emerging items. Al1 data statements, once coded for each participant, were placed in a tentative category depending on key words and phrases reflecting the content of the statement.

Checks for triangulation of content among participants were performed along with an in-depth review of researcher's decision, points and observations in light of the researcher's position and biases. Neuman (2006:149) defines triangulation as a strategy of looking at something from multiple points of view to improve accuracy. Finally, the data was analyzed comprehensively by attempting to view the conclusions reached in a critical manner that openly confronted alternative interpretations. The educator's self-assessment rating questionnaire focusing on 24 indicators (outcomes) related to environmental practice and 32 indicators related to EE features in schools and policy issues was analysed and interpreted by using simple statistical procedures, for example descriptive statistics such as distribution frequencies. The SPSS statistical package was used to see if there are associations or connections (correlation) between any of the variables measured by the survey questions. The location of schools, educator's gender and years of teaching experience were predictors of the outcome. According to Gay, Mills & Airisian (2006:467) the interpretation involves finding meaning in that data.

3.6 ETHICAL CONSIDERATION

Trochim and Donnelly (2008:24) argues that the ethical standards require that researchers do not put participants in a situation where they might be at risk of harm as a result of participation. The nature of qualitative study, in general, and phenomenology in particular, is such that the process relies heavily on the input of participants to provide a constructed view of reality from participants' viewpoints. Research participants should be protected by all means. As full contributors to the research process, participants must be aware of the pivotal role they play in the direction of the study. It is imperative that the researcher, who holds a position of power as defined by the nature of being the instrument of the research, internalize such ethical considerations. The disclosure of what a study is about may change the nature of the responses of the subjects.

The researcher protects the privacy by not disclosing a participant's identity after information is gathered (Neuman 2006:139 and Bogdan & Beklin 2007:49). To that end the researcher took the following specific steps to ensure that participants' privacy and rights were protected.

Informed consent was assured by allowing respondents sufficient knowledge and comprehension of the purposes and intentions of the study. Protection of respondents was guaranteed through anonymity of participants in the study. No one was forced into participating in a research endeavour. Participants were informed that they had the right to opt out of the study at any time. Personal use of names was avoided totally in order to ensure that data was not attached to any individual study participant in a way that might disadvantage the individual/school. LeBeau (1997:7) and Bless et al (2006:142) explain that "when we tell informants that all information is confidential, this means that we will not tell anyone else what they personally said". Pseudonyms have been used to refer to all participants in the study. This is because the publication of the research findings might adversely affect the feelings or lives of those studied.

Participants were given the opportunity to review transcripts of interview and some of the interpretations. According to Ruane (2005:23), once data has been entered into computers for analysis, the original survey containing self-identifiers might be shredded. The authenticity of the data is suggested by presenting textual descriptions cited from the actual transcripts of the interviews. In this study, adherence to the actual tape recordings by either paraphrasing or using actual excerpts from these recordings will support credibility. The credibility of themes rests on the integrity of my interpretation and loyalty to the actual words of the interviewees. In several cases the words of the participants were included in their entirety to convey the depth of their expressions and these interpretations underwent review by those participants.

3.7 VALIDITY

Schulze (2003:54) defines validity as the extent of control over extraneous variables. Validity is not derived from self-dissociating objectivism or attempts to arrive at a fixed and definitive account of the situation (Neuman 2006:196). This suggests that the integrity of the researcher should be maintained in the whole research process. The research instruments should be robust that they are actually measuring what they are intended to measure. In triangulation the researcher seeks convergence and corroboration of results from different methods studying the same phenomenon (Johnson & Christensen 2004:424). In this study triangulation (explained in 3.5) was used because multiple strategies or methods were applied. These included literature study in addition to the quantitative and qualitative methods of data gathering such self-assessment questionnaire to all educators, interview schedules with educators, local environmental education officer and focus group discussions with learners. The purpose was to seek elaboration, illustration and clarification of results from one method with the results from other methods. This also extended the range of the enquiry.

The evidence derived from empirical indicators or measures supported the study (predictors and outcomes, e.g. the self-assessment questionnaire). Qualitative researchers must ensure that they do not distort what they see or hear. In this study, the research participants' check of the transcribed interviews was also used to enhance, validate and make the data reliable. Precision and credibility in qualitative provide lenses of evaluating the finding of the research. Researchers must see to it that quotations from participants are accurate (Gay, Mills & Airisian 2006:403). Qualitative researchers belief everything they study is context- bound and does not seek "truth" for generalization to the large group of people.

3.8 RELIABILITY

One of the difficulties with quantitative research is that researchers study processes which are not stable over time (Neuman 2006:196). According to Bless et al (2006:150), reliability of measurement is the degree to which that instrument produces equivalent results for repeated trials. The piloting of research instruments was the first step to ensure common understanding of questions in instruments. Confidence in this study's findings has been obtained by maintaining trust-worthiness in process and perspective. This question of trustworthiness was addressed by ensuring, as far as possible the credibility and conformability of the process by maintaining contact with participants to ascertain veracity of interpretation and analysis as judged by all participants of the study. In this study, participants of the face to face in-depth interviews and focus group discussion were audio (digitally) recorded and transcribed verbatim and participants rechecked the transcription for authenticity. Data from different sources were compared to corroborate evidence for reliability. Through qualitative method, it is also hoped that the study generated the understanding of the research topic. Dependability of the process has been ensured by maintaining a consistent process of data collection and data interpretation which follows from the use of consistent processing methods. It is reasoned that the internal triangulation of participants' contribution can been ensured through scrutiny, by researcher and participants, of transcripts during data analysis and interpretation (Gay, Mills & Airisian 2006:403). Transferability has been assured by including participants who were representatives of the demographics of the participant population.

3.9 CONSTRAINTS

The postal self-assessment instrument was sent to schools but some rural schools were more than 70 kilometres from the nearest post offices while others did not have their own official school post-office

boxes. This could lead to lose of some questionnaires in event that the owner of the post office box is transferred. The researcher has to travel more than 2600 km (including return distance) to the area where data was gathered. The regional education office, school principals, teachers and learners for schools where interviews and focus group discussions were held co-operated with the researcher.

3.10 SUMMARY

A mixed methods research approach (quantitative and qualitative) was used to illuminate, supplement and explain the data gathered. The research population consisted of educators for Geography grade 10, learners and the Environmental Education Officer. Both the rural, peri-urban and urban schools participated in the study. Mailed questionnaire, focus group interview for educators, and interview schedule for learners and Environmental Education Officer were used to gather data. Ethical conduct ensured credibility of the research and validity of the research outcomes.

CHAPTER 4

DATA ANALYSES AND INTERPRETATION

4.1 QUANTITATIVE DATA ANALYSES AND INTERPRETATION

4.1.1 Introduction

The quantitative research was conducted in the Caprivi region of Namibia. Forty seven (47) schools which offered grades 8-10 were targeted by means of a postal self-assessment questionnaire to educators for geography. Twenty nine (29) schools returned the completed questionnaire, which shows a response rate of 62%. Twenty three (79%) of schools were from the rural areas, three (10%) of schools were from the peri-urban and three (10%) were from the urban areas. Nineteen (66%) of the geography educators were male while ten (34%) were female. In addition, eleven (38%) of the educators had teaching experience of 0-5 years, nine (31%) of educators had 6-10 years of teaching experience, six (21%) of the educators had 11-15 years of teaching experience and three (10%) educators had 16+ years of teaching experience.

The data gathering instruments were pilot tested in one of the local schools and amended accordingly. The primary purpose of the Teacher Self-Assessment instrument was for educators to reflect on their own environmental learning practices. When one does this kind of exercise frequently, it potentially leads to improvement of one's teaching practice. Quantitative research focussed on issues such as the knowledge about environmental learning, learning support materials, skills and attitudes, teaching and learning, extra-curricular and environmental actions. Educators rated themselves on a ranking scale (4 = very confident, 3 = confident, 2 = most of time unsure and 1 = seldom or never found in the classroom or school). Items on the nominal scale included how the environmental learning features in the school, the types of issues covered in the school environmental policy, how learners are involved in environmental activities, sources of environmental information and the in-service training needs for educators. Some numbers do not tally because of missing data. Numbers on the figures (graphs) are expressed in percentage (%).

The following codes were used: educators' knowledge about environmental learning (Kel), learning support materials (Lsm), skills and attitudes (Sa), teaching and learning (Tl), extra-curricular and environmental action (Ecea), environmental learning features in schools (Eef), issues covered in the school environmental policy (Isp), how learners are involved in aiming to in achieving the outcomes of the environmental school policy (Liaop), sources of environmental information for learners and educators (Si), and in-service training needs for geography educators (Istn).

4.1.2 Educators' knowledge about environmental learning

Knowledge about environmental learning is critical for the successful implementation of the curriculum in the formal education system. Figure 1 presents educators' rating on environmental indicators such as knowledge of factual information (kel1), environmental challenges in Namibia (kel2), holistic conception of the environment (kel3) and awareness of Namibian environmental learning policy for the formal education sector (kel4).

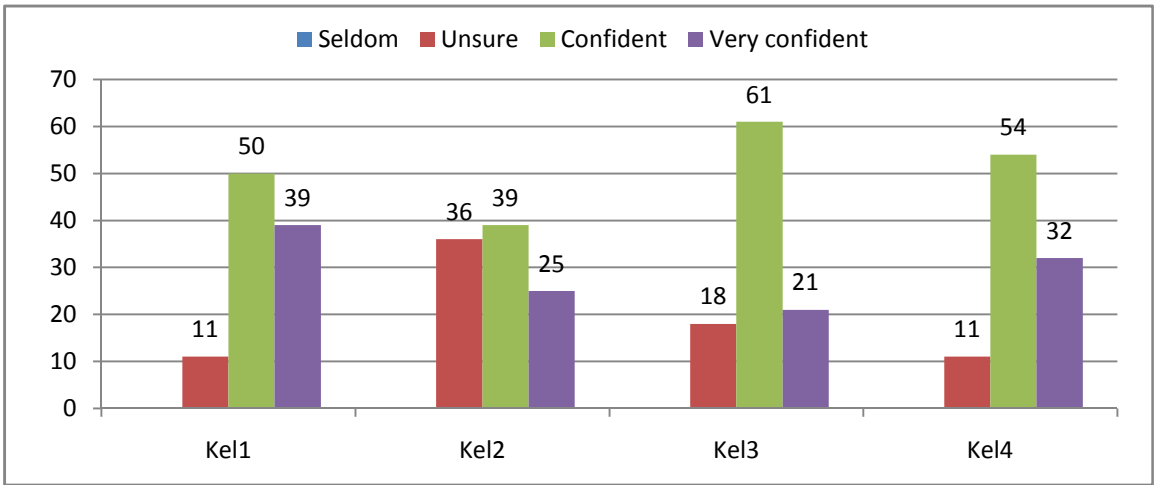


Figure 1: Educators' knowledge about environmental learning

Overall, all educators scored impressively on the confident level across all environmental learning indicators. In the self-assessment instrument, 50% of educators indicated that they were confident and 39% very confident, in their knowledge of factual information about environmental learning topics such as population, biodiversity, environmental degradation and risks (kel1). Fifty four percent (54%) of educators specified confident and 32% very confident that they know the Ministry of Education (MoE) policy about environmental learning (kel4).

Across all indicators, 61% (highest) of educators revealed that they were confident that they had a holistic conception of the environment (kel3). Thirty six percent (36%) of educators indicated that they were unsure about environmental challenges in Namibia (kel2). This is a concern because educators are expected to be knowledgeable about and act on local environmental issues. Eighteen percent (18%) of educators indicated 'unsure' on the holistic conception of the environment (kel3). This may suggest that educators are not teaching for deeper understanding. The following graph (figure 2) shows the influence of school location on educators' EL knowledge.

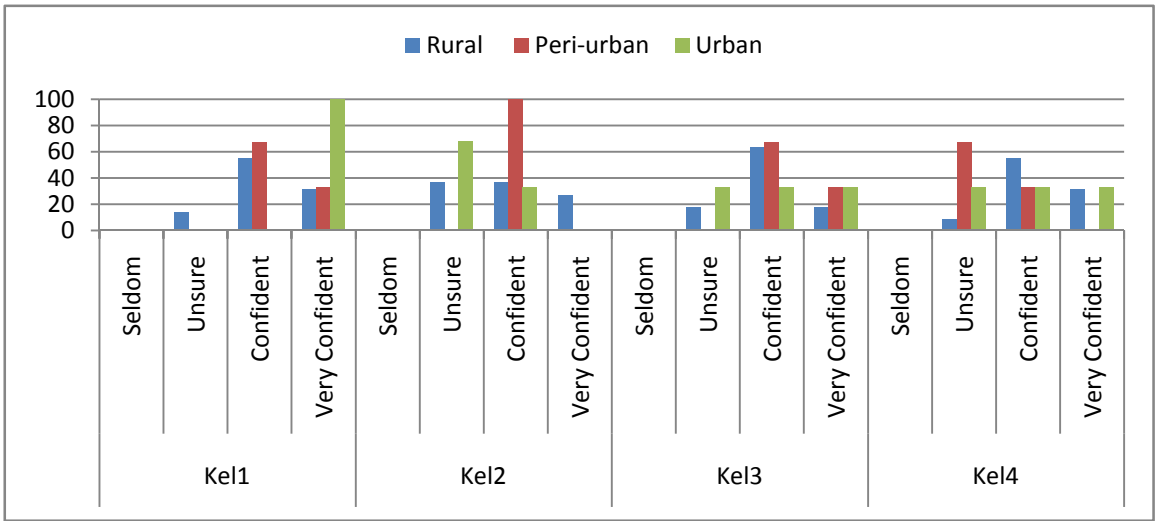


Figure 2: The relationship between the educators' knowledge of environmental learning and the location of schools

The knowledge of environmental learning changes according to the location of the school educators teach. One hundred percent (100%) of educators (the highest) from urban schools revealed that they were very confident that they have knowledge of factual information on EL such as population, biodiversity and land gradation (kel1). Twenty eight percent (28%) of educators (lowest) in rural schools indicated that they were very confident about the knowledge of environmental challenges in Namibia (kel2). It can also be observed in figure 2 that overall, the confidence level from the first indicator (kel1) through kel2 and kel3 increase from rural to peri-urban and decline in schools in urban areas.

In the self-assessment instrument, 100% of educators from peri-urban schools also pointed out that they were confident, while 66% of urban schools were unsure of their knowledge of curriculum guidelines (kel2). In addition, 65% of educators from the peri-urban schools indicated that they were unsure on their knowledge of EL policy (kel4).

The distribution of the educators' rating for schools in the urban area is constant at 33% on the last two indicators, which are: knowledge to consider environment in totality (kel3) and knowledge of EL policy (kel4). The graph shows a general concern on the level of knowledge about environmental challenges in Namibia (kel2) in urban schools and the knowledge of the ministry's environmental policy (kel4) in peri-urban schools.

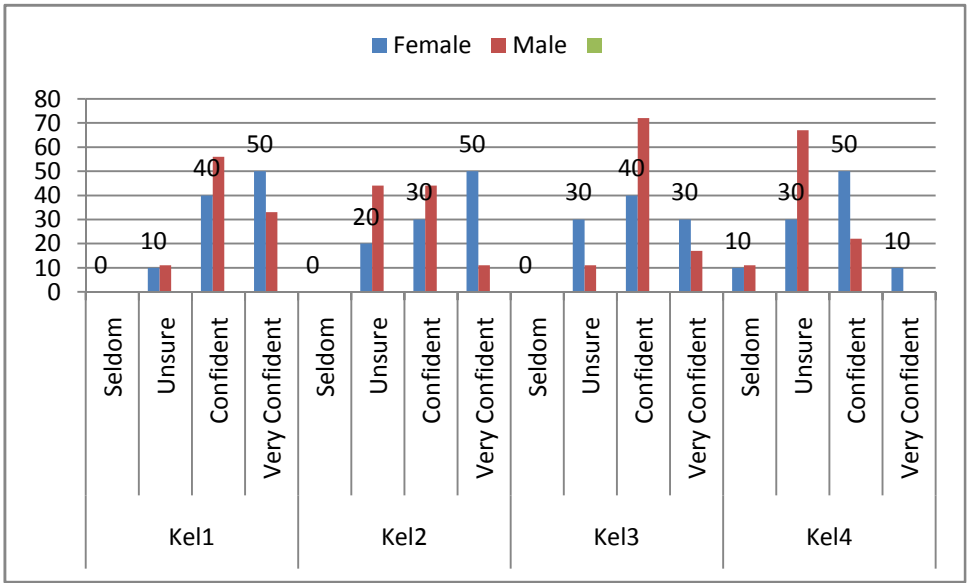


Figure 3: Knowledge of environmental learning among educators according to gender

In the self assessment instrument, 72% of male educators (highest) indicated that they were confident that they consider the environment in its totality (kel3) and 56% of male educators were confident that they have factual knowledge about environmental learning (kel1). Fifty percent (50%) of female educators revealed that they were confident that they have knowledge of the ministerial environmental policy (kel4) compared to 10% of male educators. Sixty eight percent (68%) of male educators were unsure of the environmental policy (kel4) while 30% of female educators were unsure on knowledge to consider the environment in totality (kel3). The figure shows that the female educators were more confident than male educators across all indicators for knowledge of environmental learning, with the highest very confident rating difference on both the knowledge of environmental challenges prescribed in the school curriculum (kel2) and factual information about environmental learning (kel1). There is however, a concern on the level of knowledge of environmental challenges for Namibia (kel2) and environmental policy (kel4) among male educators. There is however, a need for female educators to improve on the knowledge to consider the environment in totality (kel3).

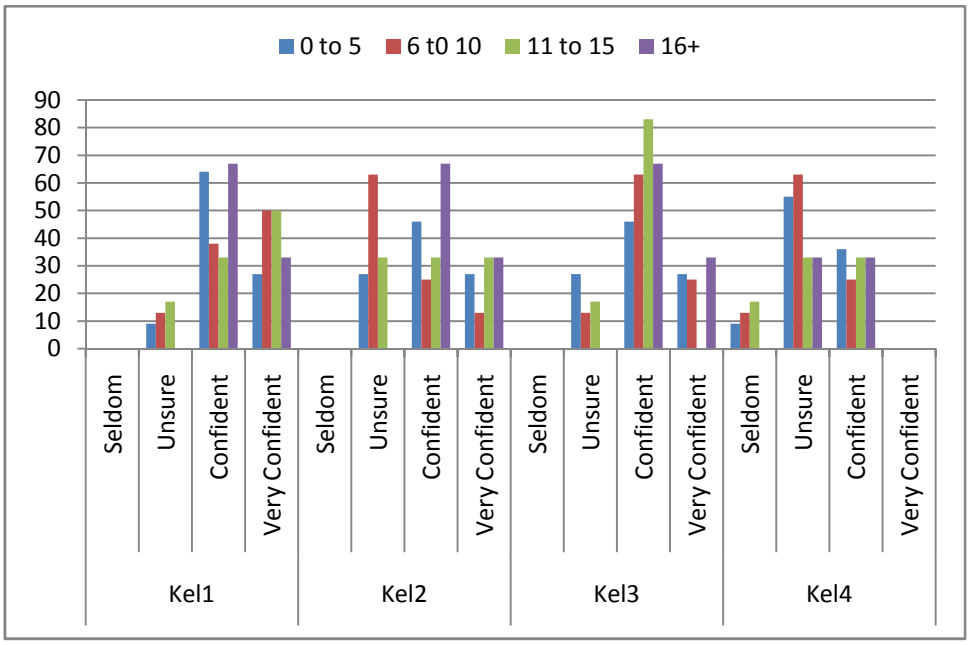


Figure 4: Educators knowledge of environmental learning according to years of teaching experience

Figure 4 above shows that 68% of educators with the teaching experience of sixteen years plus (16+) indicated that they were confident that they have knowledge of factual information (kel1) and environmental challenges in Namibia (kel2) which is more than educators in other cohorts of years of teaching experiences. Sixty four percent (64%) of educators with six to ten years of teaching experience (6-10 yrs) registered that they were unsure about environmental challenges for Namibia (kel2) and the awareness of environmental policy (kel4). All these are concerns which hinder the proper implementation of environmental learning in Geography curriculum. Further- more 84% of educators with eleven to fifteen years (11-15 yrs) of teaching experience revealed that they were confident (the highest) that they conceive the environment in a holistic way (kel3) while educators with 0-5 years of experience were the most unsure on the same indicator.

4.1.3 Learning support materials (Lsm)

Learning support learning support materials are critical for the successful implementation of any educational program. Figure 5 shows educators' rating on the use of existing official materials like textbook (Lsm1) and educators' initiatives to gather and develop their own supplementary materials (Lsm2).

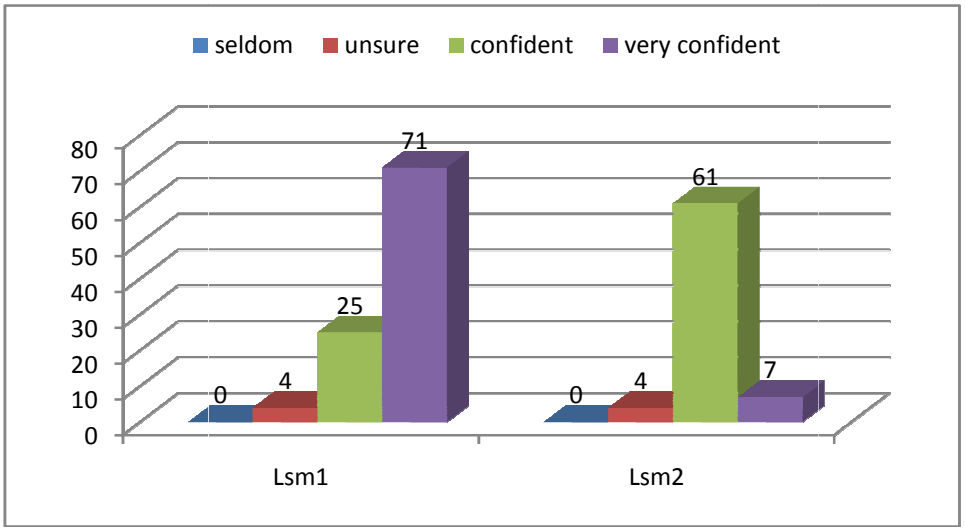


Figure 5: Educators' use of learning support materials

In the self-assessment instrument, 71% of educators indicated that they were very confident that they use the existing official learning support materials to teach EL related topics (Lsm1). Four percent (4%) of educators were unsure. Only 7% of educators on the self-assessment instrument specified that they were very confident, and 61% confident that they produce or collect supplementary materials/resources to teach EL related matters (Lsm2).

These are posters, news paper articles and videos.

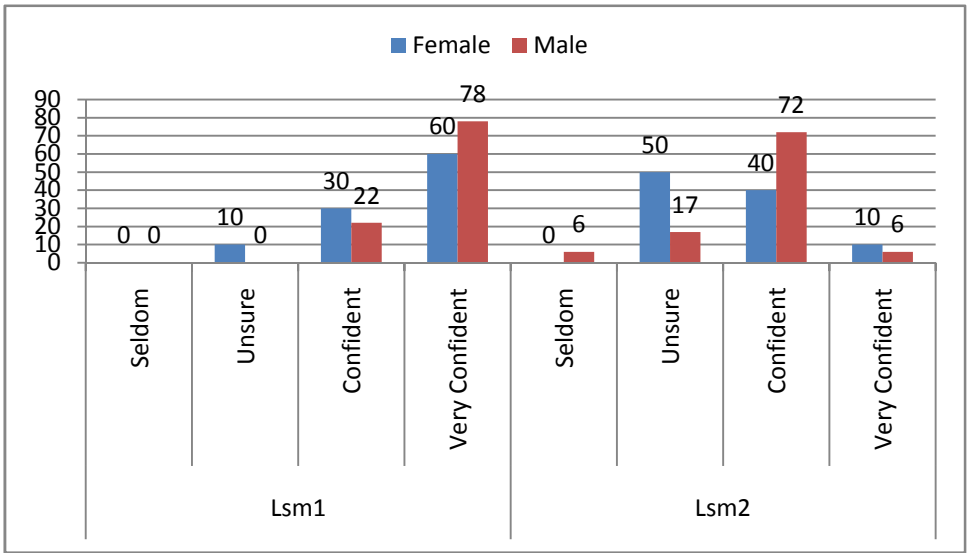


Figure 6: Educators' use of learning support materials in schools according to gender

In the self-assessment instrument (figure 6), 10% of female educators compared to 0% of male educators indicated that they were unsure whether they use the existing official learning support materials (Textbooks) to teach EL topics (Lsm1) whereas 60% of female and 78% of male educators were very confident on the same indicator. It is also observed in figure 6 that 50% of female educators revealed that they were unsure whether they produce or collect supplementary materials to teach EL (posters, newspapers) compared to only 17% of male educators. Six percent (6%) of male educators seldom collect supplementary resources compared to 0% for female educators (Lsm2). This is a concern which needs intervention considering that educators are by profession, expected to produce and adapt learning support materials to meet the diverse needs and interests of learners. Figure 7 below shows educators' use of and innovation in the supply of learning support materials according to years of teaching experiences.

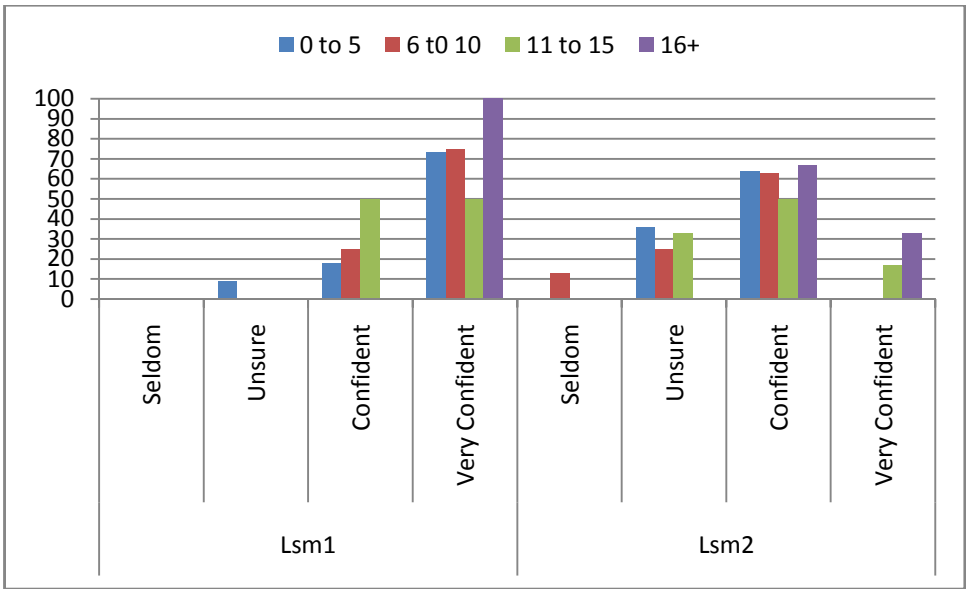


Figure 7: Educators' use of learning support materials according to years of teaching experience

Figure 7 shows that 100% of educators with sixteen plus (16+) years of teaching experience were very confident about the use of existing official materials like textbooks compared to 50% of educators with 11-15 years of experience (Lsm1). Educators with 0-5 years of teaching experience were the most unsure of all indicators. There is no significant difference based on years of teaching experience, on the confidence rating of educators' initiative to gather and supplement materials (Lsm2), although only educators with 11-15 years and 16+ years of teaching experience were very confident.

4.1.4 Skills and attitudes (Sa)

One of the most important challenges is to create an opportunity for learners to develop appropriate environmental skills and positive attitudes towards the environment. Seven environmental skills and attitudes on which educators rated themselves are: communicating the way people's cultural activities affect the environment (Sa1), communicating the way individual people affects the environment (Sa2), teaching learners to identify their own attitudes and values towards an issue or the environment (Sa3), teaching learners to be aware that there may be more than one way to solve environmental issues (Sa4), teaching learners the skills they need to contribute to the health of the environment (participation, decision making) (Sa5), teaching learners positive attitudes towards the environment and to appreciate the values of others (Sa6) and to value cultural practices and indigenous knowledge which contribute to the enhancement of environmental health (Sa7).

Figure 8 below indicates the environmental skill and attitude level for geography educators.

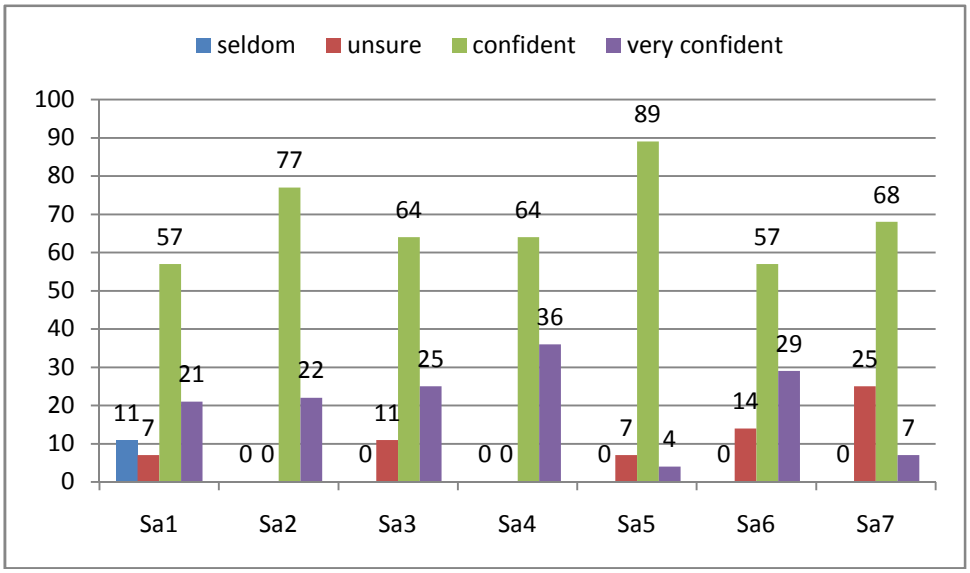


Figure 8: Educators' environmental skills and attitudes

It is encouraging that overall, all educators scored impressively on confidence levels across all indicators. In the self-assessment instrument, 21% of educators indicated that they were very confident, 57% confident, 7% unsure and 11% seldom that they communicate the way people's cultural activities affect the environment (politics, society and religion). This is a concern considering that the local practice, environment and understanding are critical in terms of relevance, progression and continuity in education. Eighty nine percent (89%) of educators (highest) recorded that they had confidence when they teach learners the skills they need to contribute to the health of the environment (Sa5), while 77% of educators (second highest) registered confidence that they communicate the way individual people affect the environment (individual actions and behaviours) [Sa2].

In addition, 25% of educators revealed that they were unsure, 68% confident and 7% very confident about the skills and attitudes that they value, cultural practice and indigenous knowledge which contribute to enhancement of environmental health (Sa7). These are concerns which require intervention by both training of educators and providing resource materials. Many educators (36%) were very confident that they teach learners to be aware that there may be more than one way to solve environmental issues (Sa4) and this is higher compared to other six environmental indicators.

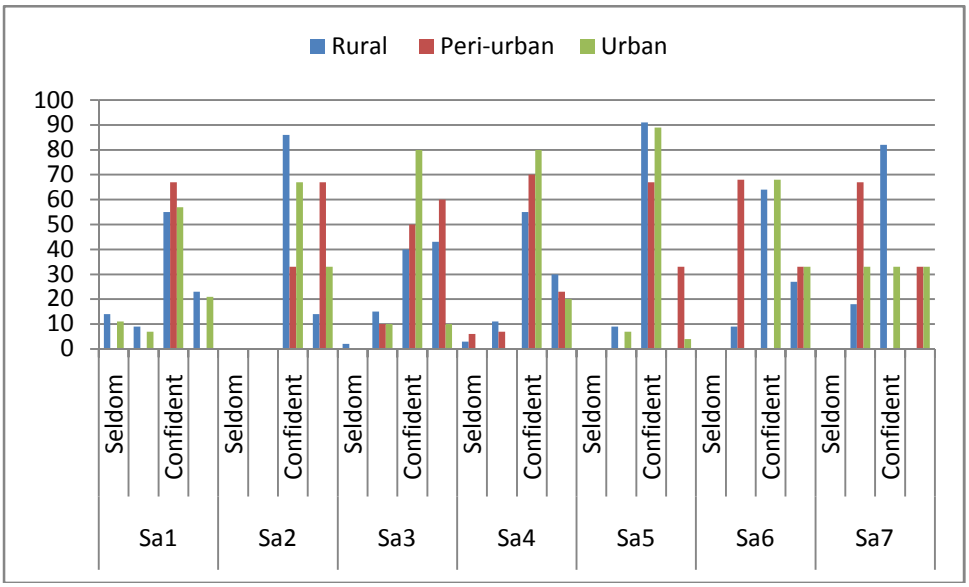


Figure 9: The relationship between educators' environmental skills and attitudes and the school location

The confidence level between the rural, peri-urban and urban schools remain impressive, although it fluctuates across all indicators (see figure 9). In the self-assessment instrument, 15% of educators in rural area and 10% in urban indicated that they seldom communicate the way people's cultural activities affect the environment – Sa1 (highest 'seldom' score across all seven indicators). This may suggest a need for intervention by provision of support to such educators. Eighty six percent (86%) of educators (highest) in the rural areas indicated confident that they communicate the way individual people affect the environment (Sa2). Ninty percent (90%) of educators revealed that they were confident that they teach learners the need to contribute to the health of the environmet (Sa5) and 80% about the valuing of cultural and indegenous practices (Sa7). Unfortunately, 68% of educators from the peri-urban schools pointed out that they were unsure if they both teach learners positive attitudes towards the environment and appreciation of values of others (Sa6) as well as the value of cultural and indegenous knowledge (Sa7). The poor performance for educators from the peri urban areas on these indicators needs to be addressed. Figure 10 shows educators' rating on environmental skills and attitudes according to gender.

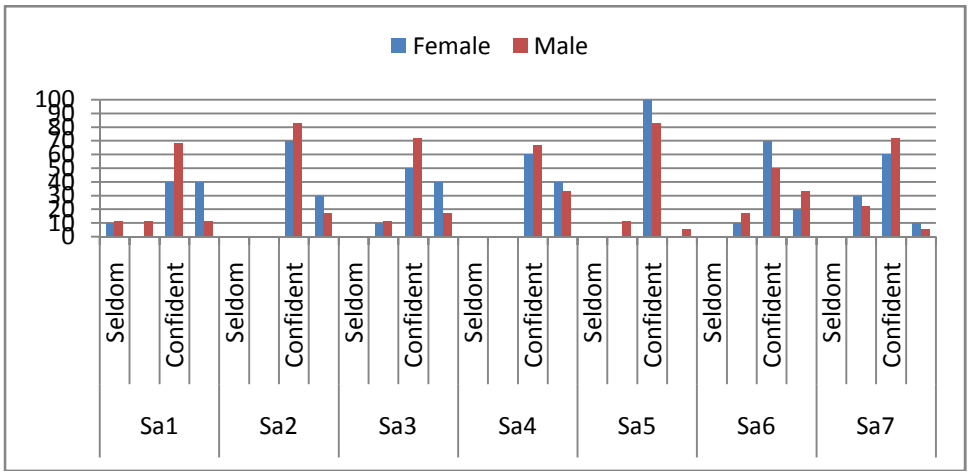


Figure 10: The environmental skills and attitudes according to gender

In the self assessment instrument, 100% of female educators were confident that they teach learners the skills they need to contribute to the health of the environment (Sa5), 70% were confident on both the skills to communicate the way individual people affect the environment (Sa2) and teach about positive attitudes towards the environment and views of others (Sa6). Again female educators indicated confidence on the first four skill and attitude indicators (Sa1-4), and the last one (Sa7) compared to male educators. Male educators seem to be more confident than female on the confidence level related to people' cultural activities (Sa1) and the value of cultural practices and indegenous knowledge (Sa7).

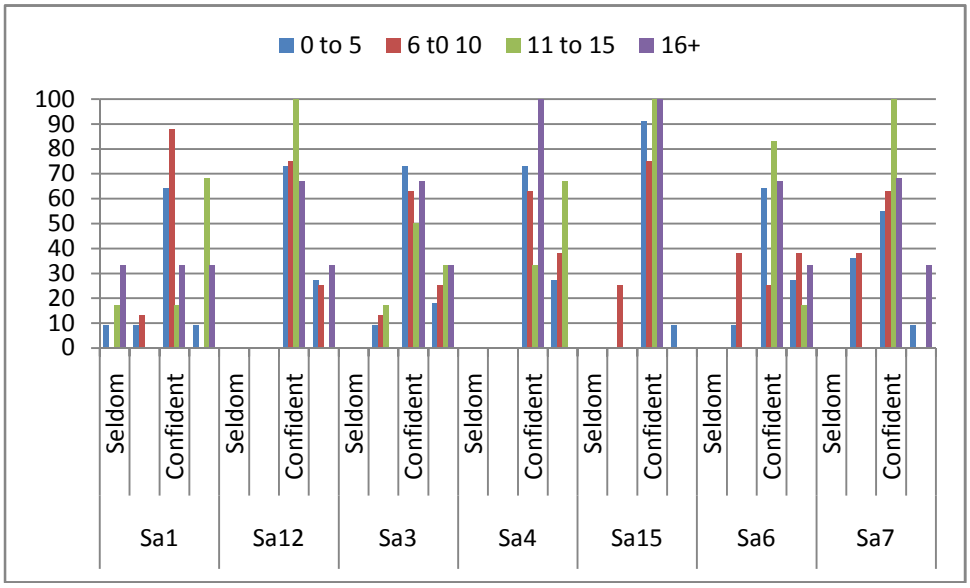


Figure 11: Educators' skills and attitudes according to years of teaching experience

Figure 11 below shows educators' skills and attitudes according to years of teaching experience.

The graph shows that 88% of educators with 6-10 years of teaching experience indicated they were confident and 68% of educators with 11 -15 years of teaching experience revealed that they were very confident to communicate the way people's cultural activities affect the environment (politics, society and region) (Sa1). Educators with 11-15 years of teaching experience, overall show the highest confident on indicators such as communicating the way individual people affect the environment (Sa2), teaching learners the skills they need to contribute to the health of the environment (Sa5), teaching learners positive attidues towards the environment (Sa6) and valuing of cultural practice and knowledge. Overall, the confident and very confident rate to include cultural issues in teaching environmental issues increase with the years of teaching experience as it can be observed in Sa1 and Sa7. Approximately 38% of educators with 0-5 years of teaching experience were 'unsure' about the last indicators, which is a concern.

4.1.5 Teaching and learning (TL)

Putting curriculum theory into practice is a challenge but crictical and necessary for the succesful implementation of the curriculum. Figure 12 presents the educators' rating on the teaching and learning aspects of environmental education in Geography. These are: the feeling of being able to comfortable, talk to learners about EL (TL1), the regular use of the local environment to do practical activities (TL2), teaching in a learner-centred way (TL3), the use of the problem solving skills to identify specific environmental problems (TL4), teaching learners the importance of identifying people or actors involved in environmental issues (TL5), the consideration of ecological cost and benefits of designated solutions (TL6), and the continuous assessment practice and activities (TL7). The figure below shows the educators' rating on teaching and learning indicators.

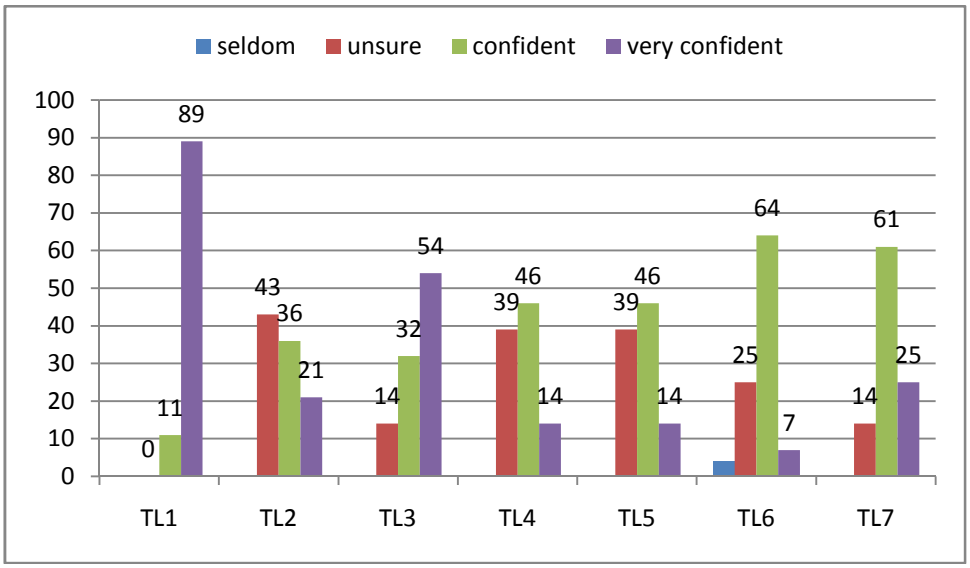


Figure 12: The of educators' rating on teaching and learning indicators in schools

In the self-assessment instrument, 89% of educators (highest) indicated that they were confident that they were comfortable talking to learners about EL (TL1). Fifty four percent (54%) of educators also revealed that they were very confident that they teach learners in a learner-centred way (TL3) while 7% of educators feel very confident that they consider the ecological cost and benefits of designated solutions to environmental problems or issues (TL6). Forty three percent (43%) of educators were unsure that they regularly use the local environment to do practical activities (TL2). This is a concern because it suggests that few educators do out-door practical activities with learners. However, it is impressive that 61% of educators purport to be confident and 25% were very confident that they continuously assess learners' tasks (TL7). Another concern is that 39% of educators revealed that they were unsure if they use problem solving skills to identify specific environmental issues (TL4) and teach learners the importance of identifying people or actors involved in environmental issues (TL5). This could suggest that educators are not teaching towards enabling learners to participate, take actions and develop a sense of appreciation for the natural environment. The figure 13 shows the difference in educators' ways of teaching and learning according to the location of schools.

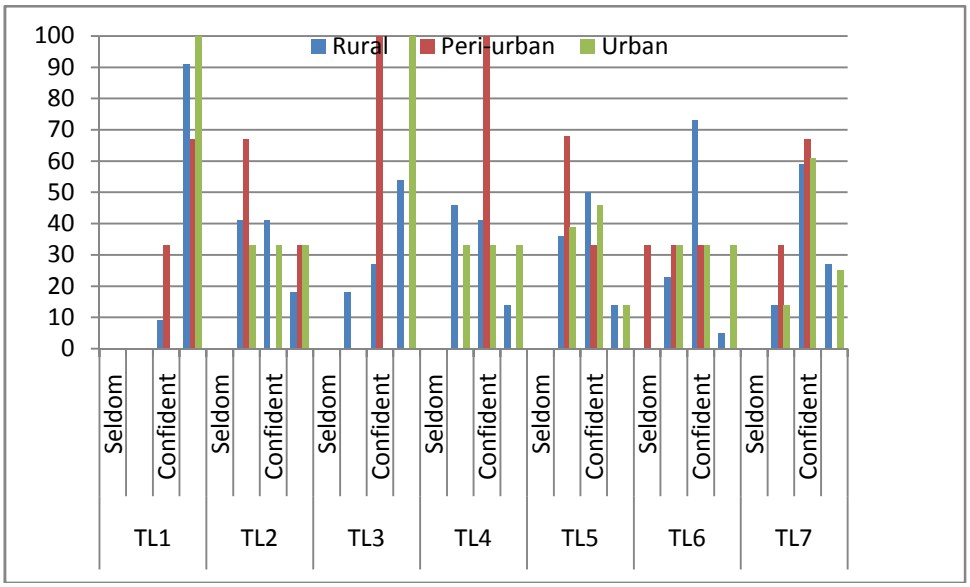


Figure 13: Differences in educators' ways of teaching and learning of environmental issues according to school location

The graph shows that educators in schools from both the rural, peri-urban and urban area were very confident that they were comfortable to talk to learners about EL (TL1). Again a concern is that all educators from the rural, peri-urban and urban performed poorly by indicating that they were 'unsure' if they regularly use the local environment to do practical activities (TL2). Forty six percent (46%) of educators from rural schools indicated 'unsure' that they teach problem solving skills to learners (TL4) whereas 68% of educators from the peri-urban schools indicated they were unsure that they teach the importance of identifying people in environmental issues ((TL5). Twenty seven percent (27%) of educators from rural areas specified that they were very confident about the use of continuous assessment (TL7) while 33% of educators from the peri-urban areas indicated they were unsure. It is interesting that 100% of urban school educators reflected that they were very confident about rating learners in a learner-centred way during their teaching (TL3), followed by rural schools at 55%. The graph gives a grim picture on issues pointed above. Figure 14 shows educators' rating on their environmental skills and attitudes according to gender.

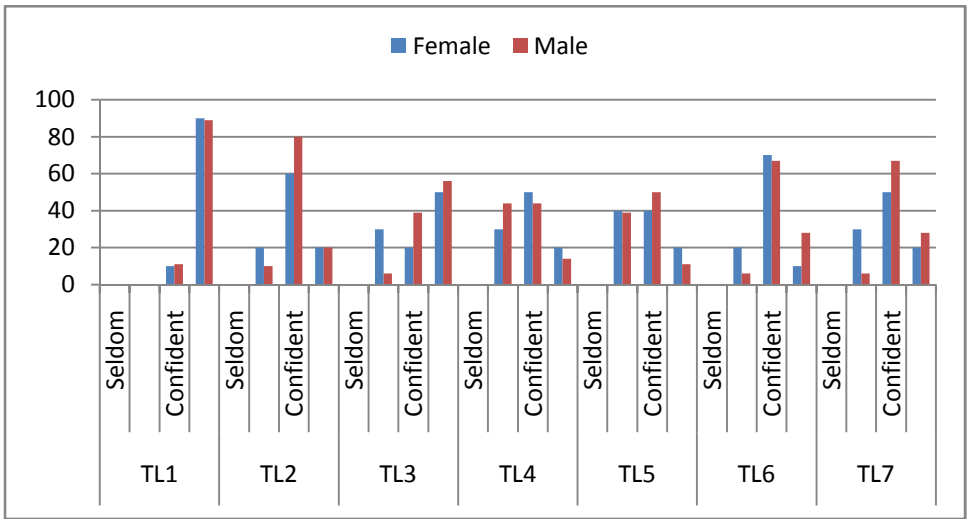


Figure 14: The female and male educators' rating of their environmental skills and attitudes

Figure 14 shows that closer to 90% of both female and male educators were equally very confident that they feel comfortable talking to learners about environmental issues (TL1). Female educators scored a higher confidence rate than male educators on the use of problem solving skills (TL4) and the consideration of ecological costs and benefits of designated solutions to environmental problems (TL6). Eighty percent (80%) of male educators indicated confidence that they regularly use the local environment during their teaching (TL2) compared to 60% of female educators (while 20% were unsure – a concern). Thirty percent (30%) of female educators registered that they were unsure whether they both teach in a learner-centred way (TL3) and continuously assess learners (TL7), which is also a concern.

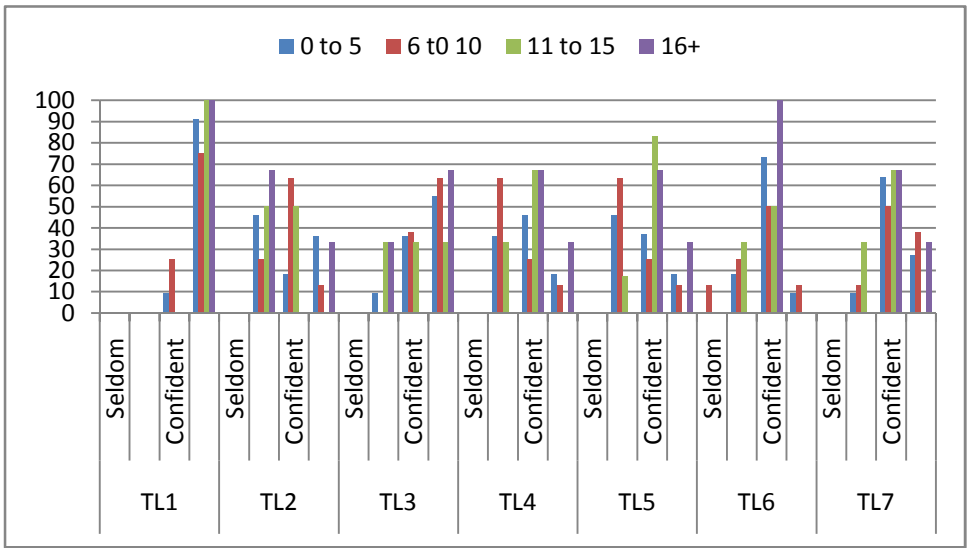


Figure 15: Teaching and learning according to educators' years of teaching experience

Figure 15 shows that there is no significant difference on how educators indicated to be comfortable talking to learners about EL (TL1). Sixty eight percent (68%) of educators with 16+ years of teaching experience indicated that they were unsure (highest) that they regularly used the local environment to do practical activities (TL2) compared to 64% of educators with 6-10 years of experience who were confident (highest) that they regularly used the local environment to do practical activities. There are no significant differences in the way educators feel confident to teach in a learner-centred way (TL3) and continuously assess learners (TL7). Sixty three percent (63%) of educators with 6-10 years of experience were unsure if they teach learners the skills they needed to contribute to the health of the environment (TL4). Hundred percent (100%) of educators with 16+ years of teaching experience indicated that they consider ecological costs and benefits to designated solutions to environmental problems in their local area. Educators (TL6) within the above cohorts of teaching experience who indicated poor performance may need continuous professional development on such indicators.

4.1.6 Extra-curricular and environmental action

Extra-curricular activities are critical in the efforts to achieve environmental educational goals. It is here that learners learn in a flexible environment by observing, doing and practising. Educators were asked to rate themselves on their involvement in extra-curricular activities at schools (ECEA1), communicating to learners about responsible citizenship (ECEA2), communicating that there are various levels of environmental action (ECEA3) and involvement in the community EL activities (ECEA4). Figure 16 shows the participation of educators in extra-curricular activities.

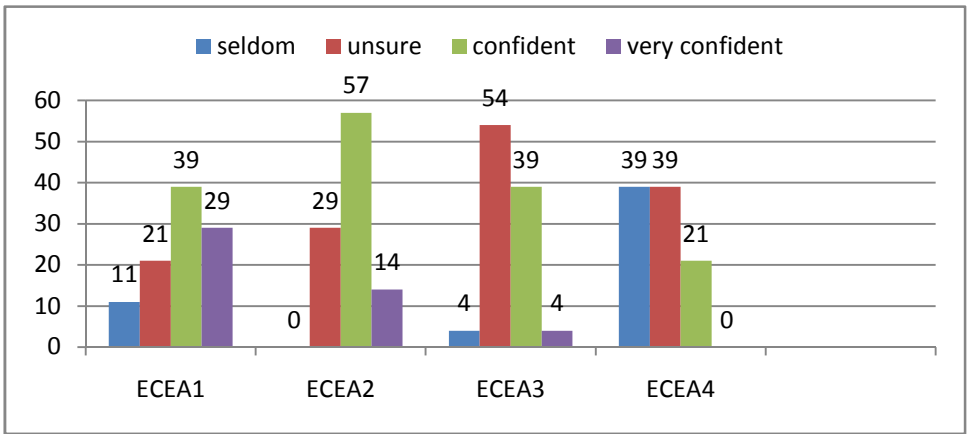


Figure 16: Educators' participation in the extra-curricular and environmental action in schools

In the self-assessment instrument, 39% of educators recorded that they were confident, 29% that they were very confident, 21% were unsure and eleven percent (11%) of educators indicated that they were seldom/very unsure of their involvement in extra-curricular activities such as sport and debate clubs at schools (ECEA1). Fifty seven percent (57%) of educators indicated they were confident, 39% very confident and 29% of educators unsure of the need to communicate for responsible citizen action to solve EL issues (ECEA2). Fifty four percent (54%) of educators revealed that they were 'unsure' if they communicated that there are various levels of environmental actions (ECEA3), while 39% of educators rated their involvement in EL related activities in their community (ECEA4) as unsure. The graph shows a picture of poor educator involvement in the last three environmental indicators and there is a need to mobilise educators.

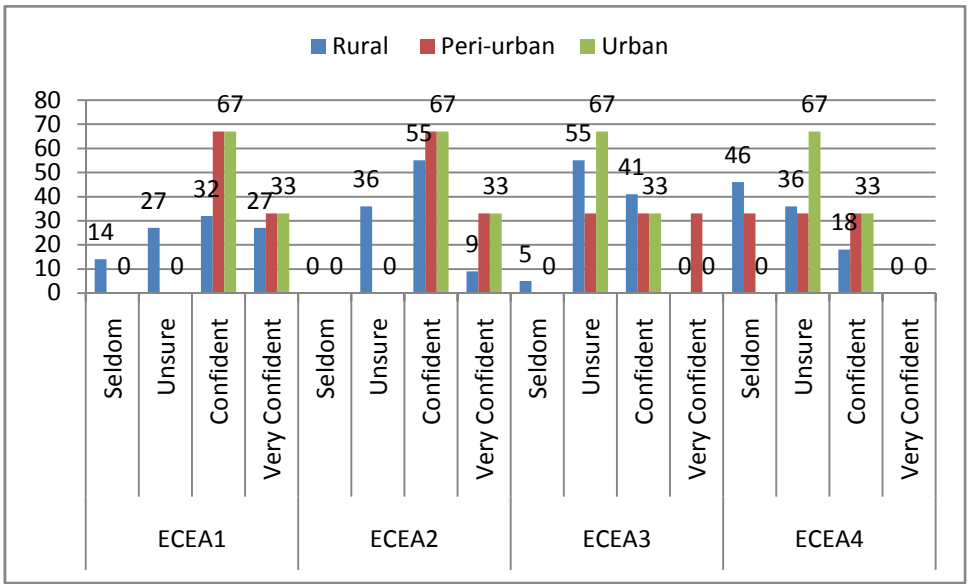


Figure 17: Participation of educators in extra-curricular and environmental action by schools according to location of schools

Figure 17 shows the performance of educators in extra-curricular activities according to the location of schools. Overall, figure 17 presents poor involvement of educators from the schools in rural areas as compared to peri-urban and urban schools. This may suggest that educators from the rural located schools need support to improve in those areas. Educators from all schools from rural, peri-urban and urban areas rated higher with 'unsure' on the last two indicators, which are levels of environmental action and involvement in community environmental activities (ECEA3&4).

Educators from the peri-urban and urban located schools were however impressive (confident) on the first two environmental indicators. Sixty seven percent (67%) of educators from the urban schools were unsure whether they communicated to learners about the responsible citizenship (ECEA3) and involvement in the community environmental activities (ECEA4). These are serious concerns which need to be addressed.

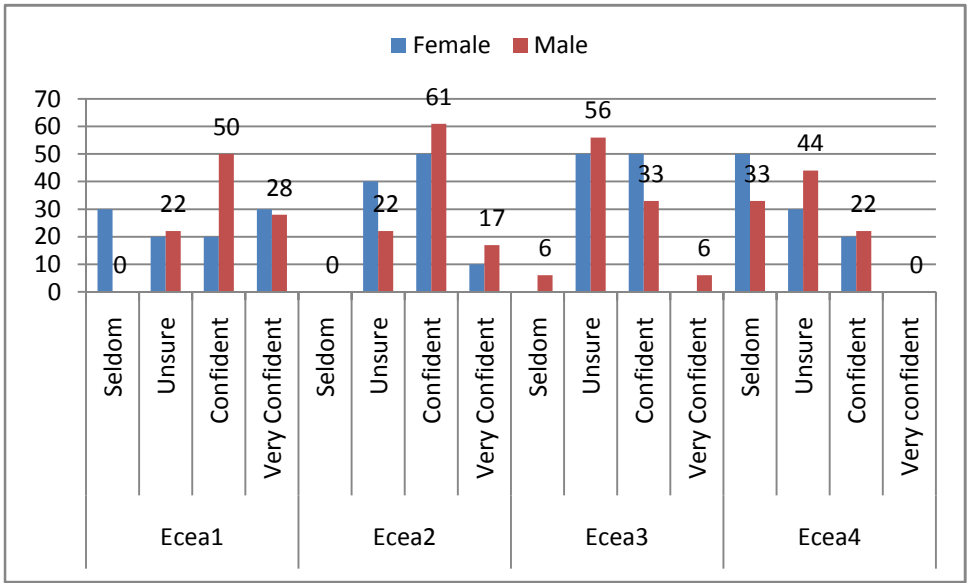


Figure 18: The female and male educators' participation in extra-curricular activities

Figure 18 shows that 50% of female educators were confident while 33% of male educators were confident that they communicated that there are various levels of environmental action (Ecea3). Females are very unsure (30%) about their involvement in extra mural activities (Ecea1) while male educators are the most to be very unsure/seldom (50%) about the involvement in EL activities in the communities (Ecea4). The graph below shows the participation of educators in extra-curricular activities according to years of teaching experience.

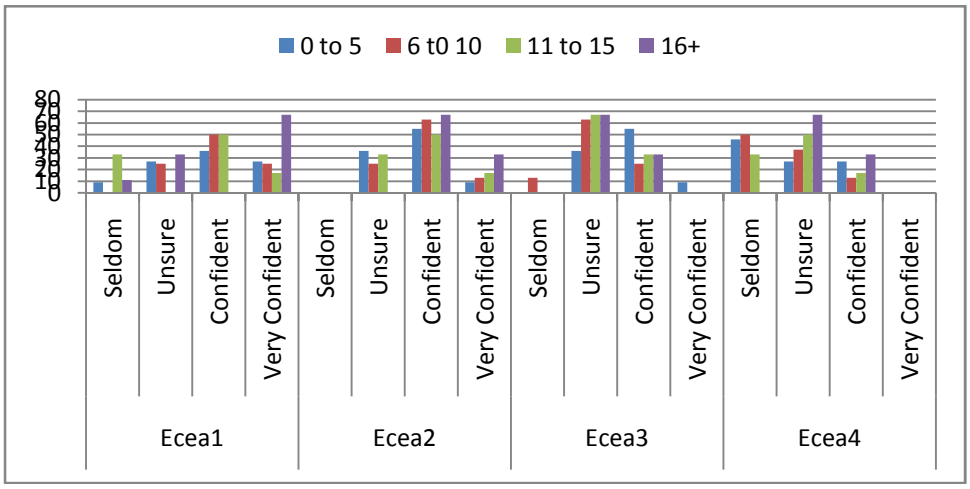


Figure 19: The educators' participation in extra-curricular activities according to years of teaching experience

Overall, educators from across all the cohorts of years of teaching experiences indicated less significance differences on the confident rating on Ecea1 and Ecea2. Sixty eight percent (68%) of educators with 16+ years of experience specified that they were very confident that they were involved in extracurricular activities at schools while 50% of other two groups of educators (6-10 & 11-15 years) were confident. The number of educators, indicating that they were 'unsure' whether they were involved in EL activities in the community increase with years of teaching experience. The novice educators (0-6 years) are the only group to be very confident that they communicated that there are various levels of environmental action.

4.1.7 Environmental learning features in schools

The following graph (figure 20) presents environmental learning features in the schools. These are: an environmental policy (Eef1), environmental action plan (Eef), EL coordinator (Eef3), commitment towards teaching about environmental issues (Eef4), EL features in most learning areas/subjects (Eef5), EL features only on enviro-day and special occasions (Eef6) and evidence of EL in practical activities such as recycling (Eef7).

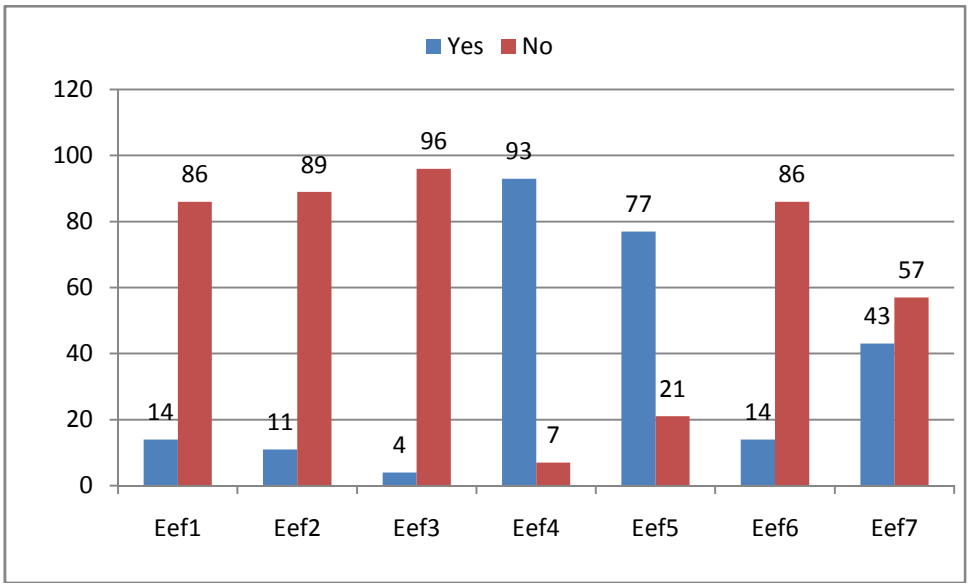


Figure 20: The environmental learning features in schools

In this self assessment instrument, 86% of educators revealed to have no environmental policies in schools (Eef1), 89% of educators indicated to have no EL action plan (Eef2) and 96% of educators have no school EL coordinator (Eef3). Environmental policy and action plan are important because they could provide guidelines on the management of school resources in accordance with ecologically sustainable practice and to serve as a starting point for addressing global environmental issues. The EL coordinator could be a focal point of contact to schools.

Ninety three percent (93%) of educators indicated to be committed towards teaching about environmental issues (Eef4) while 77% agreed that EL features in most learning areas or subjects (Eef5). Interestingly, 86% of educators disagreed that EL should feature only on environmental days or special occasions. This could be attributed to the daily teaching and basic everyday environmental activities such as general cleaning. Fifty seven percent (57%) of educators disagreed that there is evidence of practical activities such as recycling in schools (Eef7). This supports educators' poor rating of the use of the local environment for practical activities and problem solving under teaching and learning as described in paragraph 4.1.5. The following graph (figure 21) presents features of environmental learning in schools according to rural, peri-urban and urban locations.

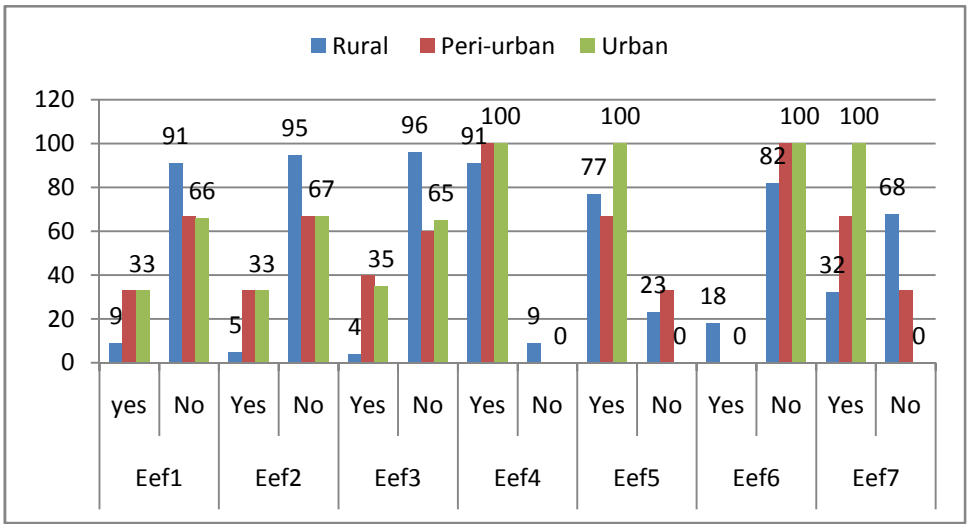


Figure 21: Environmental learning features in the schools according to location

Ninety one percent (91%) of educators from rural schools disagreed that their schools have environmental policies (Eef1) and 95% on action plans (Eef2). All schools from rural, peri-urban and urban agreed that they do not have the EL coordinators (95 & 67%). Overall, all educators from rural, peri-urban and urban schools agreed that they were committed towards teaching environmental learning (EeF4) and disagreed that EL features only on enviro-days or special occasions (Eef6). The figure also shows that urban educators agreed more on practical activities featuring in schools than rural educators (Eef7). The results reflect a big concern on the state of environmental learning implementation in all schools, although there are indications of educators' commitment as reflected Eef4 & 5. The figure below shows how female and male educators agreed or disagreed on the environmental features in schools.

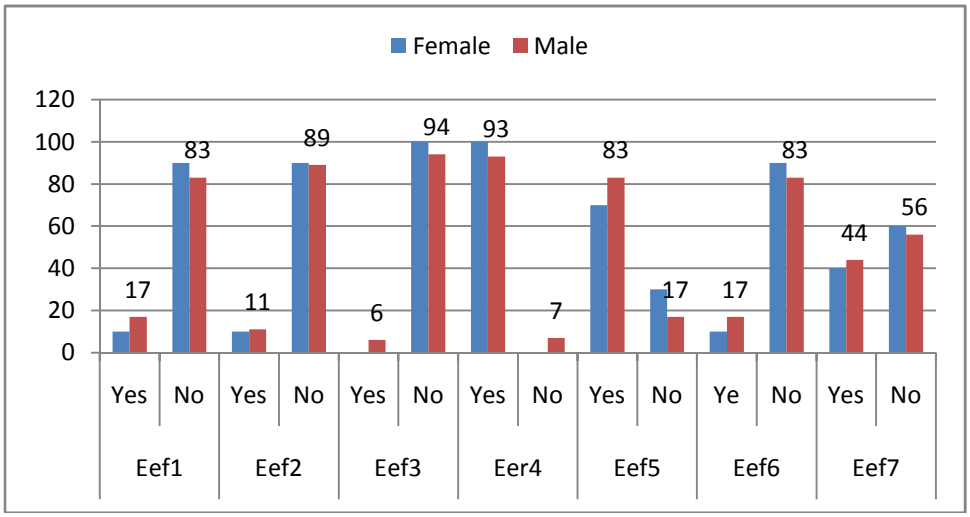


Figure 22: The environmental learning features in schools according to gender

Overall, figure 22 shows that there is no significant difference on the extent to which female and male educators agreed or disagreed with the environmental indicators above.

4.1.8 Issues covered in the school environmental policy

Figure 23 below shows issues which educators indicated were covered or not covered in the school environmental policy. Because of missing data, some numbers do not tally. This is because some educators did not complete certain sections. Issues to be covered under this topic include school ground (Isp1), ablution facilities (Isp2), litter (Isp3), water (Isp4), health issues (Isp5), waste reduction (Isp6), energy saving measures (Isp7), preservation of biodiversity (Isp8), safety and security (Isp9), use of environmental resources (Isp10), integration of the environment in the curriculum (Isp11), establishment of enviro-clubs (Isp12), and celebration of enviro-days (Isp13). Educators specified in the previous analysis that most schools do not have a school environmental policy. Educators' indication that certain issues are present in the school policy under this heading may simply mean environmental issues are dealt with as they arise, and may not be written in the policy document itself. The figure below presents the types of issues covered in the school environmental policy.

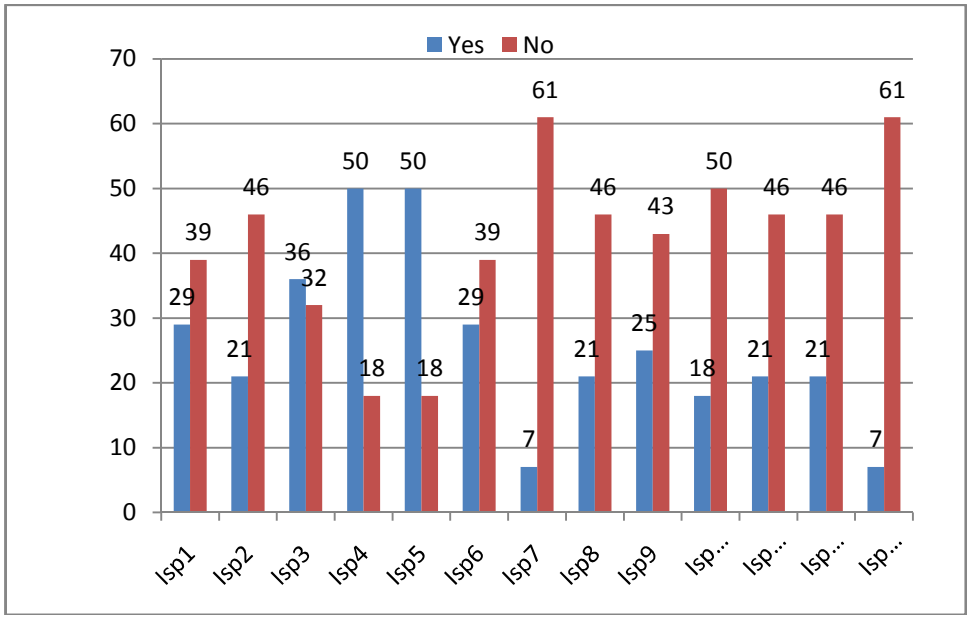


Figure 23: The type of issues covered in the school environmental policy

In the self-assessment instrument, educators mostly agreed the presence of three issues in their school environmental policies. These are: litter with 36% (Isp3 with 32% missing data), water with 50% (Isp4 with 32% missing data) and health issues (Isp5) also with 50%. Educators disagreed on the presence of all other environmental issues with many educators strongly disagreeing on energy saving measures (61% in Isp7), celebration of enviro-days (also 61% in Isp 13) and the use of environmental resources (50% in Isp10). This supports the absence of an environmental policy, and that educators merely do daily environmental activities. Participation of many rural schools in this research could have negatively impacted on the result on some aspects and the illustrative technique below attempts to clarify.

Figure 24 shows environmental issues covered in the environmental policy according to the location of the schools.

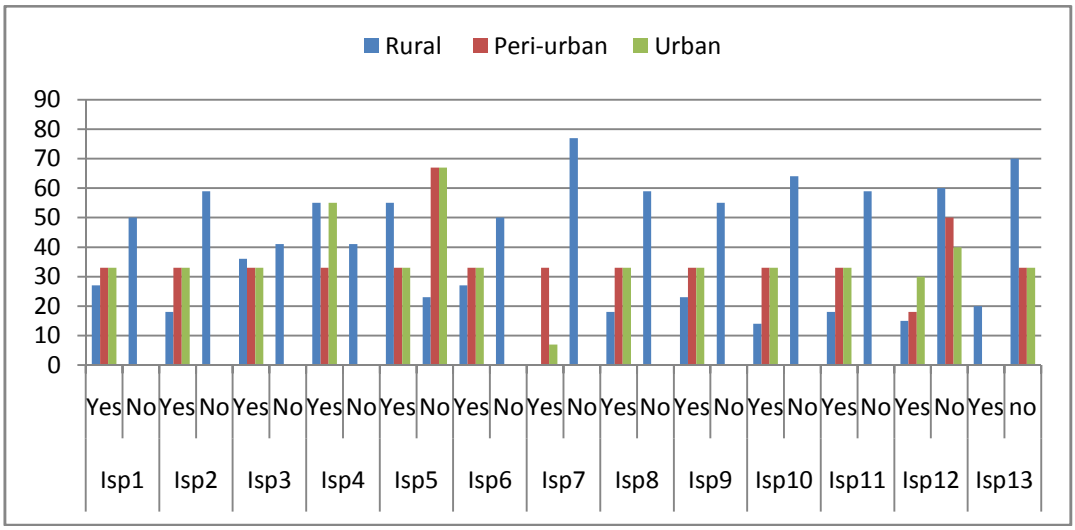


Figure 24: Issues covered in the school environmental policy according to school location

In this self-assessment instrument, the general impression is that educators from the rural schools overmelmingly agreed that most environmental issues are not present in the school policies except the following two issues: water (Isp4) with a 56% yes rating and health issues (Isp5) with a 55% affirmative rating. Most educators from rural schools indicated that issues such as the energy saving measures (Isp7) (78%) and celebration of enviro-days (Isp13) (70%) are not included in school policies. The highest persentage of educators (66%) from the peri-urban and urban schools pointed out that health issues (Isp5) are not part of their school environmental policy compared to 22% of educators in rural areas.

The picture reflected by figure 24 is a concern which may require schools to start a particpatory process to develop EE policies and audit the EL performances.

4.1.9 How learners are involved in achieving the outcomes of the EE school policy

Figure 25 presents the rating of educators on how learners in their schools are involved in achieving the outcome of the school environmental policy. These are based on the following five indicators: learning area projects (Liaop1), in-school competition (Liaop2), school fieldwork (liaop3), community fieldwork (Liaop4) and classroom projects (Liaop5). The numbers which do not tally are a result of the missing data.

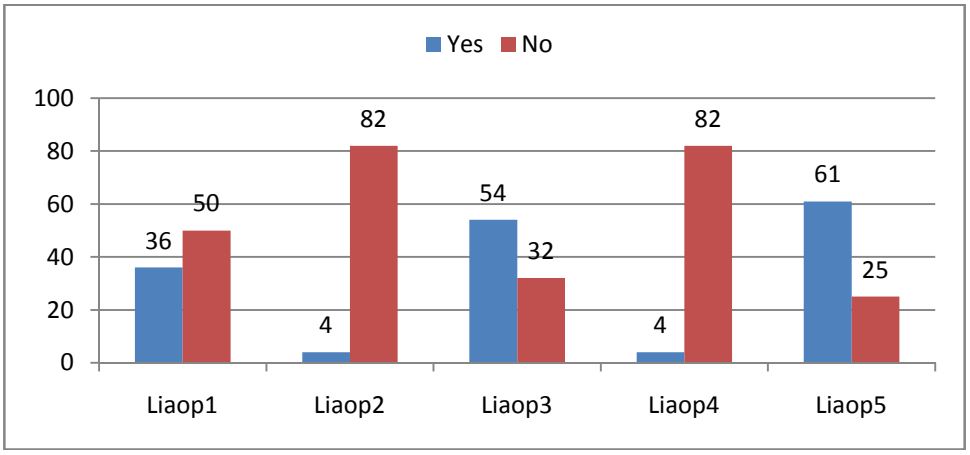


Figure 25: How learners are involved to achieve the school environmental policy outcome

In this self assessment instrument, 82% of educators disagreed that their learners are involved in environmental activities such as in-school competition (Liaop2) and community fieldwork (Liaop4) respectively. Sixty one percent (61%) of educators from rural and urban located schools agreed that learners are involved in classroom projects (Liaop5) and 54% in school field work (Liaop3).

Figure 26 below shows educators' rating of learner involvement in activities which are aimed at achieving the outcomes of the school environmental policy according to rural, peri-urban and urban location of schools.

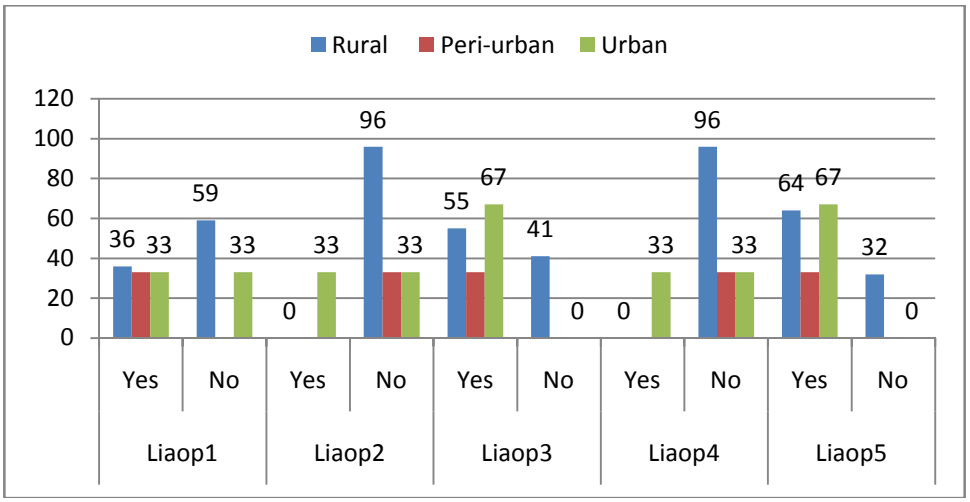


Figure 26: Learner involvement in environmental activities to achieve the school environmental policy outcomes

Figure 26 shows that educators from rural schools disagreed the most on indicators such as learners' involvement in environmental activities such as in-school completion (Liaop2) and community fieldwork (liaop4). Thirty three percent (33%) of educators from both peri-urban and urban schools rated the same on those environmental activities. In the self-assessment instrument most educators from the urban area (67%) agreed that learners are involved in fieldwork (Liaop3) and learners are involved in classroom projects (liaop5). The figure below indicates the learners' involvement in activities to achieve environmental policy outcomes according to educators' gender.

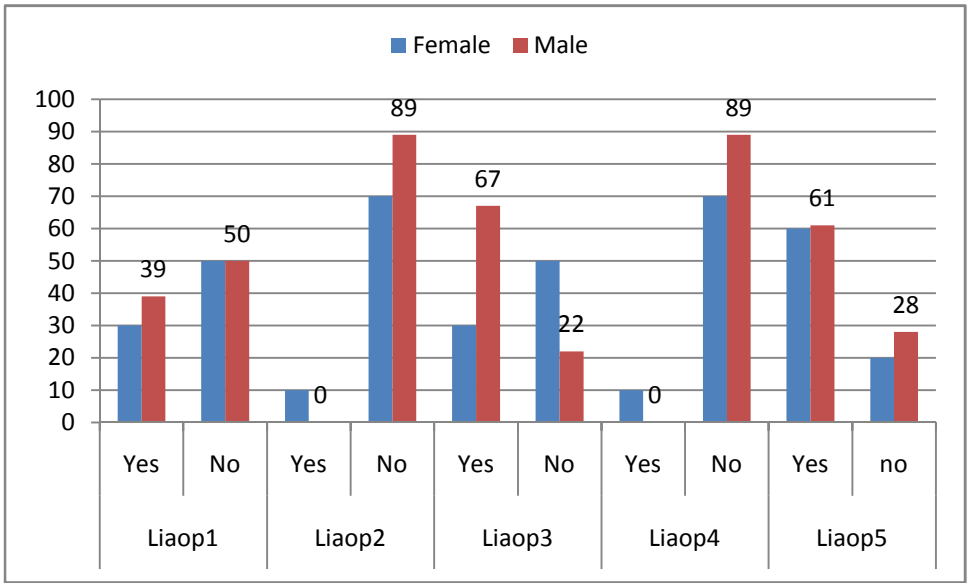


Figure 27: Learners activities according to educators' gender

The graph shows no significant differences in the agreement or disagreement between female and male educators on learners' activities to achieve the environmental policy outcomes across all indicators.

4.1.10 Sources of information educators and learners draw for environmental information

In order to achieve better educational outcomes, schools need updated, current, authentic and relevant information on environmental learning issues. Figure 28 shows the sources of environmental information for learners and educators: other educators (Si1), other learners (Si2), books and magazines (Si3), ministry of education resource centres (Si4), other government ministries (Si5), local community members (Si6) and electronic sources (S17).

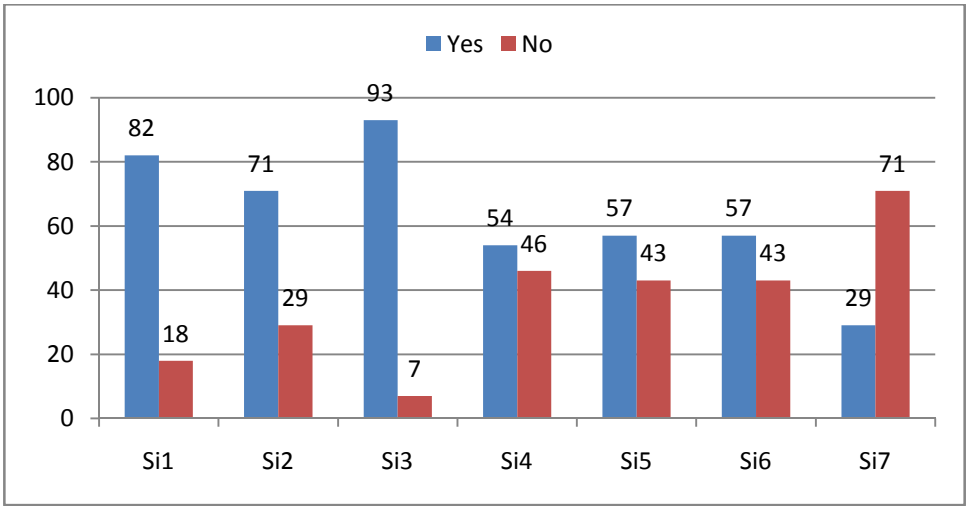


Figure 28: Sources of environmental information for learners and educators

In the self-assessment instrument, 93% of educators indicated that books and magazines (Si3) are the main their source of environmental information and followed at 82% by 'other educators' (Si1). The lowest sources of information indicated by educators are electronic sources (Si7) at 29% and the Ministry of Education resource centres (Si4) at 54%. Poor performance of 'educators' on these two indicators could be linked to the remoteness of many schools in the Caprivi region. There is, however, a concern regarding the under-utilization of local community members (Si6) and electronic media (Si7) as sources of environmental information. Figure 29 shows the educators' sources of information according to the location of schools.

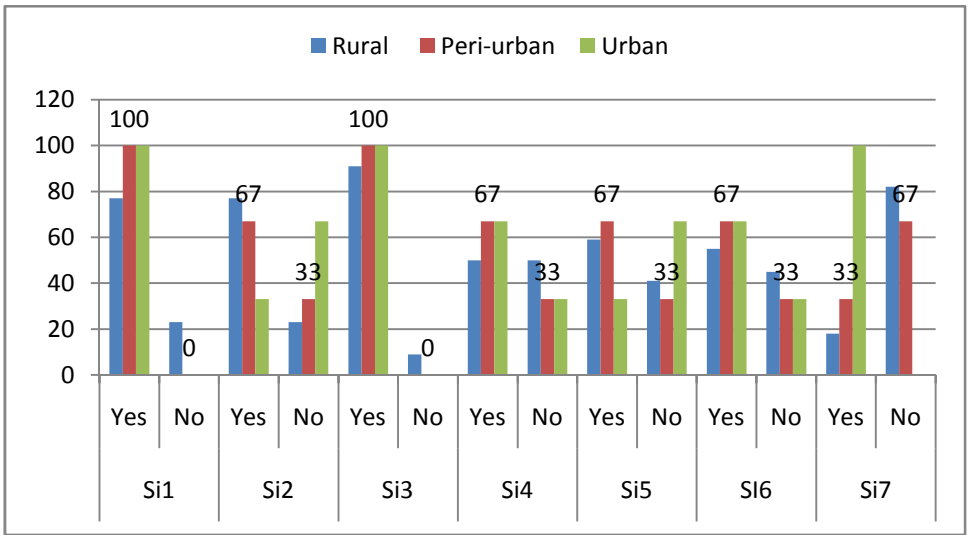


Figure 29: Sources of environmental information according to the location of schools

Educators from both peri-urban and urban located schools pointed out that their source of environmental information is 'other educators' (Si1), then books and magazines (Si3). This could be related to the proximity of schools and the availability of printed media like newspapers in towns than in rural areas. Sixty seven (67%) (highest) of educators from the rural schools indicated other learners (Si3) as their source of environmental information and the rating declined from peri-urban to urban located schools. The use of electronic sources (Si7) increased from rural to urban, with 100% of educators in urban schools professing to benefit from the source. There is no significant difference on the extent to which all schools use the local community members (Si6) and the use of other government ministries (Si5) as sources of information.

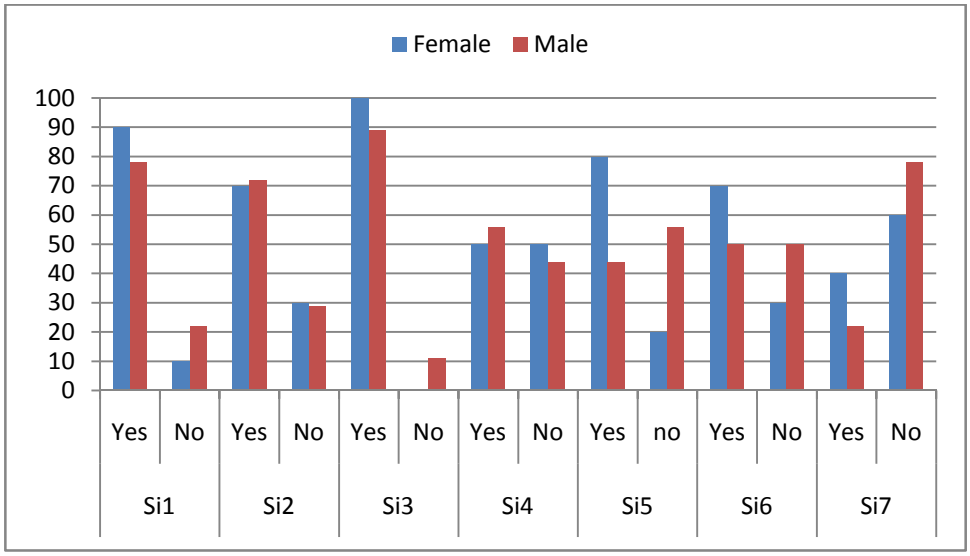


Figure 30: Source of information according to educators' gender

The figure 30 shows the source of information according to educators' gender. Overall there is no significant difference on sources of information between female and male educators on most issues. Female educators agreed most (than male) with 90% selecting other educators (Si1) and 100% specifying books and magazines (Si3) as their sources of environmental information.

4.1.11 In-service training needs for geography educators

Relevant and informed continuous professional development (CPD) of educators is necessary in order to improve teaching about the dynamic and global environmental challenges. Figure 31 shows how Geography educators indicated their training needs on aspects such as: action research in environmental learning (Istn1), assessment in environmental learning (Istn2), local to global learning through themes (Istn3), case studies on environmental learning best practice (Istn4), participation of learners in decision making (Istn5), greening of the school ground (Istn6), fieldwork techniques (Istn7), philosophical underpinnings of environmental learning (Istn8), teaching methods in environmental learning (Istn9), environmental audit at schools (Istn10) and environmental learning integration in curriculum (Istn11).

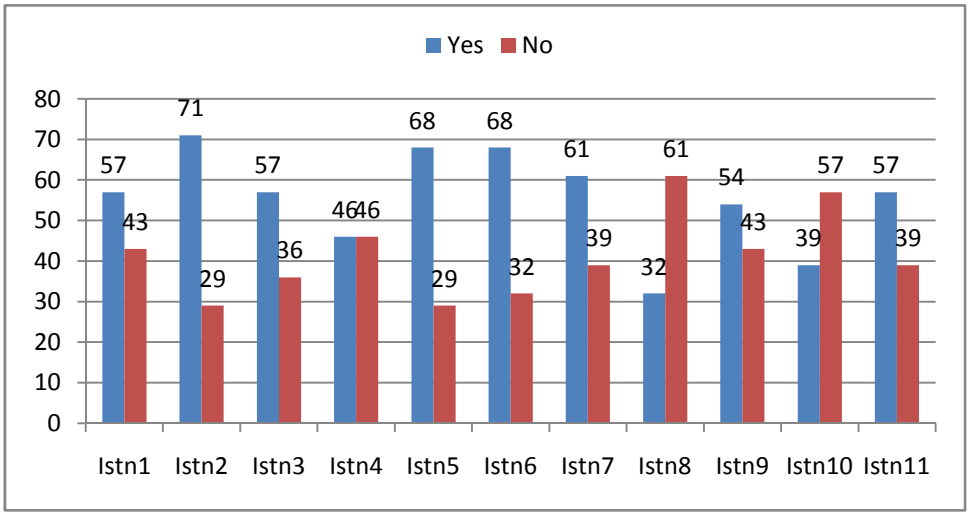


Figure 31: In-service training needs for geography educators

In the self assessment instrument, educators suggested the following as the six issues on which they most needed in-service professional training: Seventy one percent (71%) of educators indicated training needs about assessment (Istn2), 68% on the participation of learners in decision making (Istn 5) and the greening of school grounds (Istn6), 61% on both the fieldwork techniques (Istn7) and the philosophical underpinnings of EL/EE (Istn8). The sixth in-service training need is shared by 57% of educators who indicated action research (Istn1), local to global environment (Istn3), environmental audit (Istn10) and curriculum integration (Istn11) as training needs. Figure 32 shows the in-service training needs according to rural, peri-urban and urban school location.

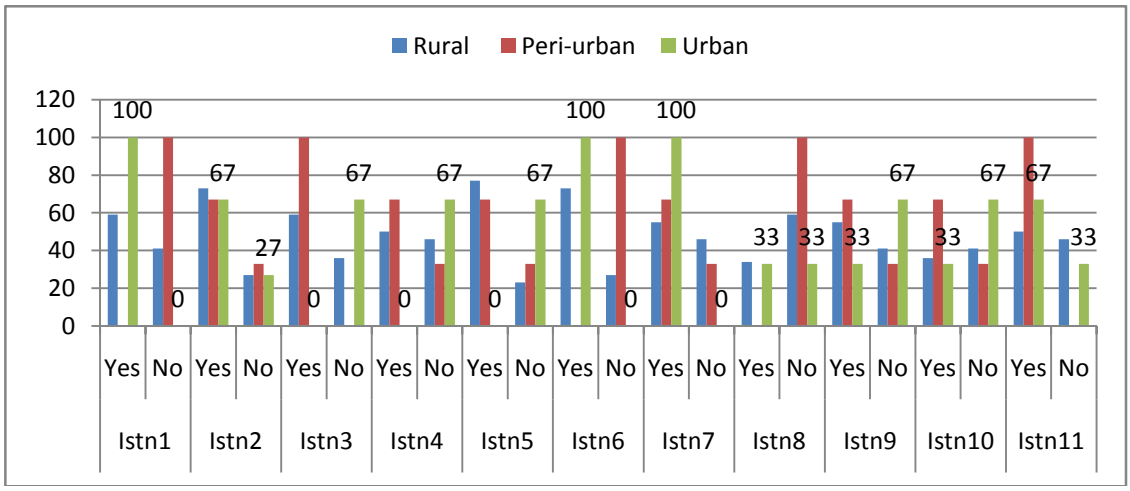


Figure 32: In-service training needs for geography educators according to school location

In the self-assessment instrument, 100% of the educators from the urban schools specified training needs in action research (Istn1), greening of the school ground (Istn6) and fieldwork techniques (Istn7). Educators from urban schools however, indicated less (0%) training needs for aspects such as local to global learning through themes (Istn3), case studies on best EE practice (Istn4) and the participation of learners in decision making (Istn5). Rural schools (67%) on the other hand need the most in-service training on assessment (Istn2). Seventy five percent (75%) of rural educators registered that they wanted training on participation of learners in decision making (Istn5) and 70% of rural educators need training on greening of the school ground (Istn6). More educators from peri-urban schools than in rural and urban schools indicated their in-service training needs (100%) as local to global learning through themes, 67% on case studies on EE best practice (Istn4), 100% on environmental audit (Istn10) and environmental education integration (Istn11).

4.1.12 Summary

The quantitative research results indicated that Geography educators have sufficient levels of knowledge and understanding of environmental learning concepts but not about the environmental challenges which Namibia faces. These are: poverty and inequality; access to water and supply; land tenure and carrying capacity; biodiversity conservation; population growth and pattern; human resource; regional and globally shared natural resources; knowledge for sustainable development, cultural attitudes and life styles. It was observed that the knowledge level on all indicators differs according to the location, gender and years of teaching experience of educators who participated in the research.

The educators predominantly use officially provided learning support materials and initiate to collect and adapt their own learning support materials to supplement what they have. There is a concern about the female educators' efforts on this score, while the years of teaching experience does not have a significant influence. Overall, the result of the research also shows a higher level of the knowledge of environmental skills and attitudes except for the lower rating on indicators regarding people' cultural activities and practice in environmental learning. The confidence rating on all indicators on skills and attitudes fluctuates according to the location of schools, gender and experience of educators.

The quantitative research also indicated higher levels of educators' comfort to teach environmental learning related topics but needs improvement on the use of local environment for practical activities and the use of problem solving skills. Furthermore, educators' indication or rating is highly influenced by the school locations and to a lesser extent by gender and years of teaching experience. Educators' participation in extra-curricular activities and issues covered in the school environmental learning policy need improvement and is influenced by school location and gender. The research has shown that most schools did not fare well on the features of environmental learning in schools irrespective of location, gender and years of teaching experience. From the research it is also clear that learners are involved in classroom projects more than community fieldwork or learning area project. The sources of information differs according to the location of schools and educators indicated assessment as the most area they need training while case studies on the best practice is the least.

4.2 QUALITATIVE DATA ANALYSES AND INTERPRETATION

4.2.1 Introduction

The five schools which participated in this research were: from urban (1), peri-urban (2) and rural areas (2). Data-gathering instruments were pilot tested on one local school and amended accordingly. The data was digitally audio-recorded and transcribed verbatim. Before the data was analyzed and interpreted, the data was coded according to the identified areas on the instruments (interview guide for educators). These are: teaching and learning; skills and attitudes; learning support materials; and extra-curricular activities. Each theme or area is further divided into sub-areas according to the interview guide and the focus group questions from the research instruments. Six educators from 5 schools participated in the interview. In addition, 35 learners from the same five schools participated in the focus group discussions. The learners' focus group discussions centred on their understanding of the concept 'environment', what they like most and least about the school environment, environmental problems found in their areas and how they could be addressed. The data analysis below can broadly be divided into data from interview, focus group discussion with learners and interview with the environmental education officer representing the regional EE centre.

4.2.2 Teaching and learning

In this area of research, the following questions were asked:

- What do you teach learners about environmental learning?
- How do you become knowledgeable about environmental learning?
- Describe how you teach about environmental learning related topics. Which activities do you use?
- Describe how you integrate environmental learning in other subjects that you teach. Can you give an example?
- How do you regularly assess environmentally related topics?
- May you list problems (if any) in the application of EE approaches.
- What is your perception on using indigenous knowledge as a teaching resource that could contribute towards efforts to prevent environmental degradation?

The following findings about Teaching and learning emerged during the research:

4.2.2.1 What do educators teach learners about environmental learning?

All educators reported that they teach learners environmental learning topics from the syllabus for Geography Grades 8-10. The researcher's expectation was for educators to locate environmental issues they teach within the four main dimensions of the environment mentioned in chapter 2 (2.4) and the areas of environmental learning discussed in (2.5). Educators from both rural and urban schools pointed out that they teach about the conservation and protection of the environment. Six educators interviewed revealed that they teach about deforestation, desertification, overgrazing/overstocking, population increase and migration, and pollution which are part of ecology in grade 10 syllabus. Educators from almost all schools indicated they teach towards the understanding of the sustainable management of limited resources in general, HIV and AIDS, renewable and non-renewable resources. One educator directly made reference to the 'sustainable use' of the environmental resources for 'future generation' to be also able to use the resource to meet their basic needs. When one educator was asked to specifically explain what global warming issues he teaches, he commented:

> "I teach learners what it is, why it is an environmental problem, causes and the impacts it has on plants and animals, and solutions too." *Geography educator, school A in the Caprivi region*

4.2.2.2 How educators become knowledgeable about environmental learning

Five educators interviewed from both rural, peri-urban and urban areas concurred that they learned and become knowledgeable about environmental issues and challenges during the time they were trained to become geography educators. All educators acknowledged that they gained more information through studying textbooks prescribed to implement the Geography grades 8-10 syllabus. Only two of the educators interviewed from both rural and urban areas showed they had gained knowledge through information from the Ministry of Environment and Tourism. One educator revealed to have gained knowledge through watching television documentaries, more especially the National Geographic. The impact of the national television (NBC) is not mentioned.

A limited number of educators specified to have gained knowledge by observing what is happening in the immediate and natural surroundings, sharing experience with others at school and compiling extra resources from newspapers. One educator described how knowledge is gained as follows:

> "As educators we are encouraged to read everyday to get knowledge. We read newspapers so that we know what is happening in our communities or country. I borrow books from the library to read and search for information to teach learners." *Geography educator from school D in the Caprivi*

4.2.2.3 Activities used by educators to teach environmental learning topics

All educators described how they teach environmental learning related topics by referring to experiential learning (practical) in which learners are taken outside the classroom to observe environmental issues in their immediate and natural surroundings. There are examples such as the traffic count, visit to the river-side (to observe erosion by hydraulic action), litter and deforestation in the local area, but on limited scale. Three educators advocated that they use the lecturing method. The chalkboard is used to write questions about a topic while learners answer questions in their exercise books. Individual and group work activities were cited by most educators. None of the educators made reference to the use of role plays, dramas, games and quiz as teaching strategies. Three educators indicated the importance of learners' experience and the use of the local examples in the classroom. Three educators indicate that their activities involve actions aimed to address an environmental problem e.g. litter collection. This is how two educators from different schools illustrated their teaching approaches in a related way:

> "We do practical, by giving learners a chart to draw a village. Technically, I tell them to reflect back and draw a village, how it looked like 10 years ago. Learners again draw the same village on the second diagram, how it looks like currently (now). They will realize that some of the trees are no more (cut), deforested. Through these activities…learners can see what happened to many trees because of high population." *Geography educator from school A, and concurred by the educator at school B*

4.2.2.4 How do educators integrate environmental learning in other subjects?

Only three educators could give examples of how they integrate environmental learning in other subjects they teach. Only four educators made general acknowledgement that EE is a cross curriculum issue in subjects like Life Science, Agriculture, Language, Art & Culture and Physical Science.

Educators from both rural and urban schools acknowledge that they do not do joint planning of lessons when teaching environmental learning issues at schools. Educators seem to use the thematic method explained in 2.15.2. This is how two educators at school D described how they integrated environmental issues in other subjects they teach:

> "In English language we can teach people on a topic like over-fishing which is in Geography grade 10 and also relevant to communities of the Caprivi floodplains. It is apparent here that people use fishing nets of smaller size, even mosquito nets to catch fish. I will tell them to write the letter on an issue (why it is becoming a problem), together with a letter of complaint to the relevant authority. In that way they learn how to write (skills) while addressing an environmental problem" *Educator A*. "in Silozi language learners can write a letter to the Ministry of Environment to complain how the elephants are destroying their crop fields. In that way they learn spelling and grammar rules." *Educator B, from school D*.

4.2.2.5 How often do educators assess learners?

When educators were asked on how often they regularly assess learners, most of the educators generally referred to individual and group assessment, giving activities on the chalkboard, home work and orals instead of the frequency. Only two educators interviewed could directly refer to the concept of continuous assessment despite that the Geography syllabus and the Curriculum for Basic Education (Broad curriculum) documents state quite clearly in details how continuous assessment should be done and what activities to do. In the Geography continuous assessment manual, learners are expected to do (per year) at least two projects, nine practicals, two end-of- term tests and four topic tests (see 2.19). The aim of implementing continuous assessment is to assess learners' level of understanding and skills development so that learning support can be provided. All schools are also expected to compile continuous assessment marks to be part of the summative mark at the end of the year. Inspection of exercise books for learners who participated in the focus group discussion revealed that: on average learners did three practical, two projects and one test. There is also no evidence of the use of the criteria reference assessment method in learners' exercise books as required by the syllabus and discussed in 2.19.2. The activities such as projects were too short and of sub-standard that they could not lead to substantial learning as conceptualized in the curriculum policy documents. (See appendix 9 summarising the observation of learners' exercise books).

One educator confessed to 'invent or manufacture marks' when s/he commented as follows:

> "At times, it is difficult to give all assessment tasks required by the syllabus. Little tasks we give learners can just be converted to real marks, as long as they get prepared for final examinations." *Educator from school E in the Caprivi region.*

4.2.2.6 Educators' problems in the application of EL strategies

When educators were asked to list problems (if any) in the application of environmental learning approaches, three educators mentioned difficulties in teaching certain environmental issues prescribed in the syllabus but not prevalent in the immediate environment. Examples given were acid rain and industrial pollution because they are located in rural schools. Three educators indicated some frustration on the lack of learning support materials. These include textbooks for learners, worksheets, reference books for educators, charts, maps, and worksheet and audio-video cassettes. One educator from a rural school pointed at language limitations of learners to understand materials in English, lack of visiting people to address learners on EL issues as challenges. Most schools cited difficulties to acquire transport (through the line ministry) to go in the field to experience nature in the wilderness. One educator indicated the challenges to change learner's environmental mind sets. Another educator commented:

> "Basically the first problem is that environmental learning is a wide subject e.g. we can talk of animals like Kudu. Learners may naturally see such animals as something to kill for food. It takes time to make learners to change their mind-sets and appreciate nature. If a hare crosses here for example, it will be chased by learners." *Geography educator at school B in the Caprivi region*

4.2.2.7 Educators' perception of indigenous knowledge as a teaching resource

When educators were asked about their perception of using indigenous knowledge (IK) as a teaching resource that could contribute towards efforts to prevent environmental degradation, the majority of educators acknowledged the significance of IK in this matter. They took cognizance of positive ways the elders lived and practised especially the sustainable use of plants (e.g. for medicines), pasture management and the values attached to animals (see 2.17). They alleged that though IK is not part of the direct school curriculum, cultural practices are immersed in the traditional songs, dramas and festive in which schools participate annually.

An educator from school B gave an example of the monoculture crop farming as one cultural activity which could be changed. The significance of IK in formal education is captured in the educators' comments below:

> "In our culture we say you cannot learn without asking the elder people. How they lived and how they continue to live. There are many trees that are in the environment but we don't know them and how they were used. Some trees bear fruits and they cannot be cut by cultural practice. Some trees are used for medicines and elders never uprooted the whole tree to get a piece of root. Elders only dug one side of the tree and covered it with the soil as a form of conservation and sustainability. These practices are slowly dying out because people are making business out of roots for medicines." *Geography educator at school A in the Caprivi region.*

> "Indigenous people, we should draw from them, for example, the local traditional leaders in a village (Indunas) earlier were empowered on local government level to guard against uncontrolled wild-fires. Learners can know that wild-fire is not part of the cultural practice." *Geography educator at school D in the Caprivi region.*

4.2.3 Skills and attitudes

In this area the following question was asked of educators. Which skills (how to) do (junior secondary) learners need to have in order to contribute to the health of the environment?

4.2.3.1 Skills and attitudes which learners need in environmental learning

Many educators found it difficult to relate their explanation to skills needed by learners in environmental learning at schools. These skills are directly related to outcomes, skills and attitudes prescribed in the syllabus for Geography which include among others, the ability to express ideas and views about the environment (using different media); argue clearly and concisely about an environmental issue; collect, classify, analyze and interpret data, especially statistics; retrieve and evaluate information about the environment from a variety of sources; identify causes and consequences of environmental problems; form reasoned opinions and develop balanced judgements about environmental issues; organize, plan, implement and monitor an environmental project; negotiate and seek consensus among and with vested interests involve in 'contested' environmental issues (see 2.11).

However, educators indicated the following as skills learners required to contribute to the health of the environment: how to manage the environment, tree planting, how to work in a group (cooperation), awareness of the dangers of deforestation and litter, awareness of HIV-AIDS and how to protect themselves, better farming techniques and the need for learner participation. Educators did not mention generic geographical skills such as map work, critical thinking, demonstrating, basic investigation where learners should to be able to observe, collect and represent data, analyze and interpret data, and present findings. The use of Information Communications Technology [ICT], where available is part of the route to basic projects in the Continuous Assessment manual for Geography and the syllabus for grades 8-10. This is an example of what one educator illustrated as skills learners require:

> "Not to cut down trees, this is deforestation. If you cut one tree you should plant another one. Plant a fruit tree a home. The habit for throwing papers should not be allowed where ever they go, whether on picnics'. They should know that for example those plastics can endanger animals. Environmental protection is very important." *Is that all?* Yes. *Geography educator at school A*

4.2.4 Learning support materials in schools

The following two questions were asked:

1. Do you have enough learning support materials to prepare for teaching environmental learning? What do you do if you don't find relevant materials?
2. Do you have any suggestions for the future environmental learning materials to be used for learners and educators?

4.2.4.1 The availability of learning support materials

All schools in both rural, peri-urban and urban areas pointed out that there is a shortage of environmental learning support materials at schools. These learning support materials are reference books for educators, games, audio-visuals materials, charts and pictures. The available materials educators use when teaching environmental learning topics in geography are the subject prescribed textbooks and subject policies. Only two educators indicated the use of newspapers in which educators adapt and use an environmental story as a resource for classroom activities. One educator testified that at least four learners share a textbook. Other teaching aids, such as basic items like rulers and photocopying paper are also in short supply, which causes a lot of frustration among educators.

This is what another educator added to indicate a dilemma in which educators find themselves in schools:

> "I have 63 learners with 10 textbooks in Geography grade 10. I don't give these textbooks to learners. I go from one class to another with these books. Some times I make copies of diagrams from books as a solution so that learners can work in groups." *Geography educator from School C*

Two out of seven educators interviewed revealed to have obtained extra learning support materials from the Ministry of Environment and Tourism. Only one educator indicated to have used local Health Clinic to source materials on HIV and AIDS despite that all schools where educators were interviewed are located within the proximity of less than 500 metres from the clinics. Educators indicated that they supplement limited materials by borrowing video cassettes and record environmental related programmes from the televisions. Educators also make copies of diagrams or texts from the textbooks for learners to use in group-work activities. This is what two educators commented when asked what they do if they do not find relevant materials:

> "Textbooks are not there, sometimes only an educator has a book. As an educator you have to copy an activity on chalkboard. At times you take them to the real environment to observe something." *Geography educator from school A*

> "I use video cassettes and fortunately we just received a television donation you see there. It has a satellite dish and I follow all programs like National Geographic which have many documentaries on conservation. I usually record them on videos and play them when I teach an environmental related topic e.g. on earthquakes and conservation of wild animals." *A geography educator from school B*

4.2.4.2 Suggestion to improve environmental learning support materials

On the suggestion for the future environmental learning materials, most educators could not make substantial recommendations. This can be attributed to the fact that educators are not involved in material development or adaptation. Without being involved in the process of evaluating and developing of materials, it is difficult to be aware of material evaluation instruments and the criteria required. Educators merely indicated the need to be provided with materials such as many textbooks, charts or posters on biodiversity, DVDs on environmental topics.

This is what one educator said:

> "I suggest that schools should be provided with TV to support environmental subjects, so that learners can be able to see. Learners should be able to see environmental problems in other countries. If we talk of environment, what is happening in other countries may affect our country e.g. Global warning." *Geography educator from school E*

4.2.5 Extra-curricular activities in schools

In this area of research, the following questions were asked:

3. What extra curricular programs does the school have in the area of environmental learning?
4. Do you know educators who would want to be in environmental awareness club advisor/facilitator? Would you want to do it?
5. In which ways is the school community supporting EL initiatives at school?
6. Does your school participate in the celebration of the National and International environment days e.g. Arbour Day. If yes please describe how it is done.

4.2.5.1 Extra-curricular programs in schools and educators' willingness to have EL clubs

All educators who were interviewed revealed their extra-curricular activities in environmental learning area as limited to school cleaning (school manual work day), planting of trees, vegetable gardening and cleaning campaigns. The planting of trees is usually linked to school activities done on the International Arbour Day which is coordinated by the Ministry of Environment and Tourism. The second common extra curricular activity is the cultivation of vegetables. This is done in the afternoon where an educator for Agriculture does practical activities with learners, but limited to certain seasons of the year. None of the schools indicated they have an environmental education club. All educators indicated the willingness to be part of the environmental education club if it is formed at their schools. The educators strongly feel that fellow educators for Grades 8-10 Agriculture, Life Science and Physical Science could be willing to join the club.

This is what an educator commented:

> "Yes I think other educators can be interested but only when one tries to involve them. The environment is important. We live in the environment. I don't think there are people who will say they don't want to be part of the club because it is like biting the fingers which feed you." *Geography educator from school B in the Caprivi region.*

4.2.5.2 Ways in which the school community support EL initiatives at school

Three educators interviewed indicate little involvement of parents in the support of environmental learning activities at schools in both rural and urban areas. Parents participate is more on cultural activities, support for the values for cleanliness at home and lending of implements to use during school cleaning activities. These implements include hoes, garden spades, digging fork, axes etc. One school reported the involvement of parents when the local traditional khuta (court) organized a cleaning up campaign in the settlement where the school is located. Three educators directly indicated no parental involvement in environmental learning activities at school. This is how one educator from one urban school described the parental involvement:

> "Parents too help learners when we prepare for annual cultural competitions. They prepared songs related to the environment and learners have to demonstrate (drama) how they lived, hunted animals using bow and arrows. They learn more about the environment." *Geography educator from school A*

4.2.5.3 Participation in activities marking national and international environmental days

Despite that the Support Environmental Education in Namibia (SEEN) project (2002-2006) produced a special booklet on national and international environmental days and how they could be celebrated, educators are only aware of the National/International Arbour day. This is the only day educators who participated in the interview indicated they do something special to commemorate, raise awareness and participate in environmental activities. In addition, the celebration involves the participation of selected schools in a region (province) in which they compete through songs and drama after a key note speech by an environmental expert or regional leader like a governor.

None of the educators referred to the commemoration of special environmental days such as world wetland day, international day of water, women and peace day, world meteorological day, earth day, world population day, world habitat day and on day of biological diversity. One educator lamented:

> "Yes, we participated on a day organized by the Ministry of Agriculture. No, here we ignore some of these things and we concentrate more on examination." *Geography educator from School D*

4.2.6 Learners understanding of their environment

In this section, learners were asked the following questions:

- What do you understand by the term 'environment'?
- What do you like about your school environment?
- What do you like least about the school environment?
- What environmental issues or problems are found in and around your school?
- What do you think can be done to address these problems?
- What classroom environmental learning activities do you enjoy most in classroom?
- How often do you have outdoor activities/classes?
- Do you usually celebrate environmental days at school?
- Do elders at home tell you to look after the environment?
- What environmental project did you participate in at school?
- Do you have anything extra to comment about the school and the environment?

4.2.6.1 Learners understanding of the term "environment"

All learners from both rural, peri-urban and urban schools have a basic understanding of the term 'environment'. The explanation is in a holistic way related to the concept of 'environment'. Learners' understanding of the environment is that it is anything around them and a place where the living and non-living organisms are found. They emphasized the co-existence between flora and fauna (including human being and other animals living together). The understanding is that the environment is created by the lithosphere, hydrosphere, atmosphere and the biosphere. One learner at school A linked the natural environment to the story of creation by God in the bible (pristine environment rich in biodiversity). When asked to give examples of what two learners from different schools mean by 'everything around us' this is how they exemplified:

> 'These are things like the soil we plough, plants, birds even fish in the river. *Geography learners from school A.* "trees, people, animals, air, water and a lot of things." *(Geography learner from school C)*

4.2.6.2 What learners like 'most' and what they like 'least' about their environment

Many learners like their school environment for reasons that the schools are clean and safe from snakes and mosquitoes. The other common reasons why learners are proud of their school surrounding were: sport fields (for football and netball) and tree planting (orchards) across most schools in rural and urban areas. Learners are quite clear on how human beings benefit from plants. A common understanding is that plants are a source of food (fruits and vegetables), provide shelter (shade for learners in the afternoon), prevent erosion by agents such as wind or water, provide beautiful flowers and play a major role in carbon dioxide and oxygen balance of the atmosphere. One learner from school D indicated his/her appreciation of the way educators teach learners at school. This is what three learners from school C said when they were asked why they like their school surrounding:

> "I like our school because there is nothing polluting the air, clean air around the school." *learner from F*. "Because we have clean fresh drinking water." *learner D.* "Educators teach us to be clean." *learner E.*

Learners did not predominantly refer to the importance of wild animals, insects, cultural activities and management of their institution as things they are proud of. Urban school learners indicated their dislike of the school environment due to littering problem, air pollution from gravel roads, wastage of water, soil erosion, and unhygienic classrooms, leaking roofs, graffiti and punishment to dig out trees. Learners, especially in rural areas, indicated the lack of security at schools as part of their concerns (dislike). This is because the schools were frequently broken into by thieves and animals from the surrounding villages damaged walls and windows of the school buildings. Learners from both rural and urban schools also cited the lack of proper care for their school orchards. Inadequacy (limited number) and dirtiness of toilets were expressed by two rural schools. Learners seem to blame school cleaners for not carrying out their duties. The other dislike for one rural school was absenteeism of fellow learners. This is how one learner described it:

> "What I do not like about my school environment is that many learners sometimes do not come to school. *Why?* When it is time for rain they decide not to come to school and they also look after cattle when elders come to school to receive money for the old people (old age pension paid by the state)." *Geography learner from school E*

4.2.6.3 Environmental problems around the school environment and learners' suggested solutions

Learners seem not to clearly understand what an environmental issue is. A common environmental problem cited by all schools from both rural and urban was deforestation. There is a clear understanding as to why people cut trees. These range from selling timber (business), building materials, and clearance of land for crop fields and source of energy (fire-wood). Wild-fire (uncontrolled) was the second popular environmental problem reported by all rural schools. This is how one learner described the negative impact of wild-fire on the eco-system.

"Small animals and insects in the ecosystem cannot run faster and can be hurt or killed by fire. Their living standards become worse if the grass and trees are burned." *Geography learner from school E*

Learners demonstrated the understanding of the negative impact of air pollution on the health of people. Global warming seems to be well-known environmental problem among learners. Other problems most cited by both rural and urban schools were: air pollution (including sources for CFCs), over-grazing, soil erosion, litter, leaking public water tapes, leaking sewage pipelines, alcoholism, and vandalism of properties.

Learners suggested the following solutions to the environmental issues mentioned above:
According to learners, an issue such as vandalism of school properties could be addressed by erection of a fence around the school. Education and information should be provided to communities where uncontrolled wild-fire is an environmental problem. Learners suggested the provision of bust bins in areas where litter is prevalent or public places. Other common suggested solutions by learners from both urban and rural schools were: planting of many trees, recycle, re-use and compost. This is what two learners suggested as solutions to some environmental problems in their area:

"They should buy perfumes which do not contain dangerous gasses, but ozone friendly (CFCs)." *Geography learner at school A.* "Plant one tree if you cut one is a better way. Educate people how to protect their environment; people should decompose the garden refuse and papers." *another geography learner at school A.*

4.2.6.4 Classroom environmental learning activities learners enjoy most

Learners interviewed mentioned in common that they enjoy outdoor activities where they are given more responsibilities. They emphasized the observation and discussions of environmental issues. Two rural schools (C&E) learners enjoyed going out of the classroom and looking at plants and insects and to work in the garden. One urban school mentioned action oriented learning activities related to sustainable use of water, energy and recycling of bottles. Direct indoor classroom activities learners enjoyed best are group-work and pair-work activities where learners discuss and share information. This is what a female learner mentioned she enjoys most in the environmental learning classroom:

> "I enjoy the learner-centred way of learning in which everybody has knowledge, participate in teaching instead of the educator being the only one talking and just use the chalk board while we listen." *Geography learners from school C.*

The observation is that some learners interpreted their enjoyable classroom activities through learned concept or environmental issues while other learners within same focus group discussions embraced methodological processes (also see 2.9).

4.2.6.5 Practice of outdoor activities and celebration of environmental days at schools

Some learners mentioned that they rarely have outdoor activities at schools. A few cases where learners were taken outdoors is when they learned geography topics such as litter, clouds, wind direction, traffic count and the soil profile and horizon. This seems to be a contradiction of what learners enjoy most as mentioned in 4.2.6.4. It could be interpreted that learners are not satisfied with the frequency of outdoor opportunities provided. This is what learners from school A and D said on the frequency of the outdoor activities:

> "It is done once in a month, like last term, we went out to see litter in the local area with the geography educator." *Learner from school A.* "Last week afternoon we were out on the Trans-Caprivi Highway next to our school and doing a project on traffic counts for Geography." *Learner from school D.*

Learners from school B in an urban area directly indicated they had no outdoor activities in geography. Other school subject educators, which learners acknowledged to have organized outdoor activities, are educators for Agriculture, Life Science and Physical Education. Learners from two rural schools purported not to have celebrated a national or international environmental day. Two schools made reference to National Arbour day and one school indicated to have participated in World AIDS Day (1 December).

4.2.6.6 How do elders (parents) tell learners to look after their environment?

This was aimed to assess the extent to which parents contributed to environmental knowledge, skill and value development of learners. Throughout the focus group discussion with learners from both rural and urban schools, reference was predominantly made to the 'cleanliness' of their immediate environment (land pollution) and the prohibition of uncontrolled wild-fire. Other forms of environmental problems parents communicated to learners were: not to cut trees, not to break bottles, to use water wisely, to clean their bodies and household utensils, courtyards and not to burn garbage but to decompose them. There is a clear indication that learners can articulate parents' desire for the needs of the future generation to also use natural resources wisely. This is what two learners from both rural and urban schools mentioned on the co-existence of people and animals.

"They always tell us not to cause wild-fire in the forest because it kills small animals." *Learner from school B.* "They always tell us not to kill elephants so that our children should also come and see animals." *Learner from School C*

In addition, parents also inform learners at home not to cut all trees in the field (slush and burn) but rather have some trees to provide shed and manure from leaves in the fields. It also became obvious that learners from rural school D are told about the importance of rotational grazing.

4.2.6.7 Environmental projects learners participate at school

Environmental projects cited by learners from the three schools are: gardening and tree planting projects (for extra income and mere practical), the HIV and AIDS behavioural change project and general cleaning of the school. Two other schools revealed to have no environmental projects at schools (also see 2.19).

4.2.7 The role of the local environmental education officer

This is the office in the Ministry of Environment and Tourism headed by the environmental education officer. In this area of research, the following questions were asked

- How do schools use your office to promote environmental knowledge, values and attitudes?
- What challenges and opportunities does the regional environmental learning office encounters with regards to the implementation of environmental learning policies?

4.2.7.1 How the local environmental education officer promotes EL in schools

In the interviews the researcher conducted with the environmental education officer, it was indicated that she is now responsible for two regions (provinces) with approximately 419 primary and secondary schools (96 in the Caprivi and 323 in the Kavango region). The regions do not have an environmental education centre (see 2.18). The office is responsible for organising school tours (for both primary and secondary schools) to the nearest National Parks. Due to financial problems, NGOs and the local business people usually sponsor such school tours. Transport is usually organized through the line ministry (education) while special vehicles for the Ministry of Environment and Tourism are used in parks. In such tours, if initiated by schools, they may suggest topics which are linked to the curriculum (or just their needs) and that may form part of the excursion programme. Part of the activities in the parks include, but are not limited to, tree identification exercises, game watch and understanding of animal behaviours. Through these activities, learners can deepen their understanding and awareness of our natural world.

On return from environmental tours, learners usually share their environmental experiences with others (learners and the general public) through the local radio station (Silozi service of the Namibian Broadcasting Corporation (NBC). Since the official has just a year in office, she has initiated environmental clubs in schools such as the Kizito College (in town) which has a vegetable garden and an orchard for indigenous plants used for medicine. The second school is Sangwali Senior Secondary School (90 km from the town of Katima Mulilo) which initiated a recycling project.

4.2.7.2 Challenges and opportunities which the local EE officer experiences

The first problem is that two regions with over 250 schools are too large for one official. The main challenge is transport problems to cover the vast area. The nearest Environmental Education centre is Namutoni in the Oshikoto region and Katjikona EE centre in the Ojozondjupa region (approximately 900 km from Katima Mulilo). In urban areas like Katima Mulilo, the regional council does not coordinate activities with the office. It was, however, acknowledged that the town council (responsible for affairs for the town only) especially the Tourism Office is coordinating with her office on a planned project on waste management.

The Caprivi region is now apparently divided in three conservation zones and workshops will usually be conducted for learners and communities. The Ministry will, in near the future construct EE centres in each of the 13 regions in Namibia. The environmental education office also participates in National Science fair. Materials (charts, videos) are obtained from the head office in Windhoek and provided on request of schools.

4.3 SUMMARY

The output of the qualitative research analyses and interpretation shows that educators have knowledge of environmental learning issues such as deforestation, desertification, overgrazing, population and migration issues and pollution. Educators become knowledgeable through teacher training programmes and professional reading. Educators indicated that they mostly use group-work and outdoor activities. Educators acknowledge environmental learning as a cross-curricular issue and the concept of continuous assessment. Problems educators face are lack of learning support materials for learners and reference books for educators.

Educators seem to be aware of the significance of indigenous knowledge but its application in everyday teaching could not be verified. Participation in extra-curricular activities related to environmental learning was limited to general school cleaning and vegetable gardening. It was observed that there is less community involvement in environmental learning activities in schools. Few schools celebrate environmental days or have environmental clubs. Parents or guardians are, according to learners contributing to sensitising them on environmental issues. Learners were able to name classroom activities of interest, what they like least about their environment and projects they participate at school. Lastly, the work of the environmental education officer, who is supposed to be responsible for EE centre, is still in an infancy stage.

CHAPTER 5

CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS

5.1 INTRODUCTION

The research focused on the stakeholders who play a significant role in the implementation of environmentally related educational curriculum in the Namibian schools. Educators are expected to translate the educational theory into practice in schools. Parents are also expected to monitor the standards and support the implementation of the intended curriculum in order to ensure that there is continuity of what is learned at school and home. This also entails the relevance of the curriculum to the demands or needs of the society. My research problem was to look into the extent to which Grades 8-10 geography is organized at school level to enable educators to deal with local environmental/practical issues and also to create an opportunity for learners to develop environmentally responsive knowledge, skills and attitudes in order to be able to navigate through the world of challenges. The core issues in this research include educators' and learners' environmental knowledge, teaching approaches, curriculum integration, educators' perception of IK, outdoor activities, assessment, learning support materials, community and the support systems in the curriculum implementation process.

In determining the extent to which environmental learning in Geography is implemented, I am hoping to unpack educators' professional praxis and the challenges which educators experience. This understanding will help to shape my role as a curriculum developer and a leader. Information derived from the research could be used to inform schools in the Caprivi region and others in Namibia so that they can consolidate on better practices/gains while improving on areas of weakness in terms of their environmental learning understanding, skills and attitudes.

5.2 CONCLUSIONS

5.2.1 Integrated conclusions from both literature and empirical study

5.2.1.1 Knowledge and understanding of environmental learning

Knowledge and a concern for the environment has been part of the curriculum in many ways before and after Namibia's independence in 1990. The Namibian legislations and the ministry of education's curriculum policy documents give prominence to environmental issues in the curriculum (paragraph 1.2). The reasons given for why environmental learning should be provided to all learners in schools is based, among others, on the policy of equality, quality, democracy, equity and access (paragraph 2.4.3 and 2.8), the declaration of the universal education for all (EFA) and the UN Decade for Sustainable Development (2005-2014) and the UN Decade on Biodiversity (2011-2014). These require commitments from all stakeholders. Sustainable development was also pointed out as a vehicle toward achievement of Namibia's vision 2030.

The key issues are the explanation of environmental education itself, the interdisciplinary nature of EE, life-long learning, thinking globally while acting locally, systems and interdependence of the living and the non-living; the physical environment, and the built or designed environment (paragraph 2.4). It is also crucial that environmental issues are seen or interpreted through four main dimensions of environmental learning: political, social, economic and biophysical dimensions (paragraph 2.5). This concept of the environment is intended to achieve a holistic development of learners. Environmental-related learning should also focus on the three main areas of learners' development such as understanding ideas ABOUT, THROUGH and FOR the environment (paragraph 2.6).

It is also noted that the curriculum content for Geography comprises key global environmental issues such as population growth and poverty, food and agriculture, tropical forests, biological diversity, desertification and drought, fresh water, oceans and coasts, energy, atmosphere and climate, managing solid waste and sewage, hazardous substances and global security (paragraph 2.4.2).

The curriculum for Geography grades 8-10 syllabus gives prominence to environmental issues such as the use of renewable and non-renewable resources, population increase and its impact on the natural environment including the processes of desertification, deforestation and bush encroachment (paragraph 2.13).

The result of the empirical study (quantitative) shows that geography educators from both the rural, peri-urban and urban schools in the Caprivi region have sufficient factual information of environmental learning topics such as population, biodiversity, environmental degradation and risks. This was supported by educators who revealed in the interviews (qualitative) that they teach local environmental topics such as deforestation, overgrazing, pollution and population and migration. The focus was more on conservation and protection of the environment. However, 36% of educators the majority of whom were male were unsure about environmental challenges in Namibia. Sixty six percent (66%) of educators from urban schools did not have the knowledge of the curriculum guidelines for EE while 65% of educators from peri-urban did not have the knowledge of EL policy for education in Namibia, of which 66% are male.

Geography educators interviewed strongly agreed that they become knowledgeable about environmental issues through formal teacher education training programmes and the reading of prescribed books. Only a few educators indicated that they acquired information from other stakeholders and agencies. Educators stated they had no opportunities to attend EL workshops and therefore disagreed that workshops had an influence on the implementation of EL. Knowledge of EL varies according to educator's years of teaching experience.

5.2.1.2 Skills and attitudes

It is also argued that the geographical nature of environmental learning should involve systematic observation through enquiry, and physical and human relationships (paragraph 2.11). It is also imperative that educators and learners are aware of the environmental education competencies, that is, knowledge with understanding, skills and attitudes. They should also be aware of the aims of geography syllabus (paragraph 2.12).

The result of data analysis of interviews indicated that educators do not understand specific skills and attitudes which learners require. In most cases activities were incorrectly referred to as skills.

The result of the quantitative aspect of research indicates however that 18% of educators did not have confidence that they communicate the way people's cultural activities affect the environment while 25% did not value cultural practice and indigenous knowledge which contributes to the health of the environment. Most educators did not know the kind of skills which learners need in order to contribute to the health of the environment. Only a few attempted activities such as tree planting were cited as a skill or value.

5.2.1.3 Teaching and learning strategies

The extent to which educators use adapted teaching strategies determines the successful implementation of the curriculum. It should be noted that learners should engage in the educational processes which leads to environmental action. It is presented that the characteristics of learners at junior secondary school require learners to think on higher level (social critical), that is, to analyse and synthesize information, evaluate ideas, take action and show commitment to preserve and maintain the health of the environment (paragraph 2.7).

It is also acknowledged that in Namibia, the educational processes are by policy, more linked to social constructivism. In social constructivist philosophy, learner's prior knowledge/lived experience and the role of educators as reflexive practioners are paramount in any successful learning. Learners should be the centre of activities. Learning should be in the context of the learner's environment/real-life situation. Collaborative and co-operative learning is encouraged. Educators are viewed as facilitators and scaffolders. The skills of knowing how to work with constantly changing data, thinking critically and creatively, recognizing how to work together on projects and persisting in the face of pressure are just a few of the new competencies that educators need to help learners to achieve (paragraph 2.9). It is also emphasized that the values related to appreciation of and care for the environment, independent thinking, respect and rational argument are critical for environmental education (paragraph 2.14).

The result of the empirical study (quantitative) showed that most of the educators who participated in the research are comfortable to talk to learners about EL, teach in a learner-centred way and continuously assess learners. However, they do not use the local environment to do practical activities with learners (especially most educators in rural schools and generally female educators).

Educators use lecturing and group-work methods. In concurrence with educators, learners said they enjoy learner-centred teaching methods which involve outdoor activities, pair and group work activities in which they discuss issues. They also commented that they rarely do practical outdoor activities, thus supporting educators' views on the same subject. A considerable number of educators do not use problem solving skills when teaching EL related issues (especially rural schools).

5.2.1.4 Integration of environmental learning in other subjects

It is observed that environmental learning is a cross-curricular issue and cannot be treated as an add-on subject (paragraph 2.3). Of the three integration models discussed (paragraph 2.15), Namibia has, to a large extent, followed greening of the existing curriculum (infusion) which many countries in SADC followed. The illustration of how environmental topics/issues can be taught through interdisciplinary approaches calls for a unified approach to teaching and assessment (team teaching and authentic assessment). Compartmentalization of knowledge is not recommended as long as three dimensions and areas of environmental learning are taken into consideration.

The result of the empirical study showed that educators integrate environmental learning across the curriculum. On average, half of the number of educators who participated in the interview schedules mostly use infusion rather than the thematic or integrated curriculum approach. Half of the educators seem to have limited ideas on curriculum integration of environmental learning in the other subjects.

5.2.1.5 The use of outdoor activities and the educators' perception of indigenous knowledge

Geography, by its nature requires learners to do outdoor activities in order for them to develop knowledge and understanding of geographical or environmental concepts, principles and processes (paragraph 2.10 and 2.11). Out-door activities provide learners with valuable experience in getting closer to nature, which sensitizes them on environmental issues and enhances their knowledge in a systematic manner.

Literature has also shown that learning can be enhanced by concepts such as ‘eco-school’ or ‘whole school approach’ to environmental learning where learners, educators, local government and the members of the community are brought together (paragraph 2.16). This links up with the framework for Local Agenda 21. It encourages learners to engage in a process of facilitating sustainable development at a local level because learners are encouraged to take actions beyond the classroom and develop responsible attitudes and commitments both at home and in the wider community.

Societies are not homogenous and there is no universal approach to the earth’s environmental problems. Values of biodiversity and natural resources are driven from many religious, spiritual, aesthetic, educational, recreational and cultural uses. Ethical dilemmas of resource management and conservation will always be complicated. Integration of a range of values from stakeholders is the way forward. Political history, awareness of traditional scheme and negotiated rules of conduct are paramount in any multicultural society. This requires new orientation to teaching and learning methods and expected community participation (paragraph 2.17).

Educators interviewed acknowledge the use of out-door activities in their lessons, but in contradiction, learners’ focus group discussion indicated that they are few cases when they are taken for outdoor activities (paragraph 4.2.6.5). This may indicate that educators merely described the intended or conceptualized teaching approach instead of the actual teaching practice on the ground.

From the empirical study it is concluded that educators interviewed are aware of the importance of indigenous knowledge in terms of sustainable and unsustainable ways of living. There is, however, no evidence that IK is integrated in their daily teaching of environmental issues in schools. Evidence from the quantitative research also indicates that educators do not use their local environment for practical activities. Most schools do not have EL school policies, action plan and EL co-coordinators and participation in national and international environmental days.

Schools focused on addressing issues related to the use of water, litter and health issues while paying little attention to waste reduction, the use of energy saving measures, preservation of biodiversity and the use of environmental clubs in the daily aspects of school life especially rural schools.

5.2.1.6 Varying methods of assessment in environmental learning

The literature review of policy documents indicates that various assessment tools, preferably criterion-referenced should be considered if learners are expected to show reliable evidence of learning. It is observed that examination-driven curriculum as opposed to continuous or outcome system of educating is not appropriate in modern educational trends. Official documents on the constitution of continuous assessment marks are, in principle, clear but the implementation thereof is still to be investigated. Both diagnostic assessment and formative, including summative assessment are stressed. Most important is for learners to be aware of the goals of the instruction.

In principle, assessment should encompass all three main purposes, that is, assessment "FOR, AS and OF" learning. Assessment should be based on a variety of information sources. Learner portfolios are regarded as important evidence for learning. It is also crucial that learners are involved in self assessment, group and peer assessment. Assessment should also be based on pre-set criteria of the assessment standard (paragraph 2.19.2). It has been noted that learners are expected to do project work (basic geographical investigation), practical (geographical skills activities) and topic tests.

The evidence from the empirical study showed that most of educators regularly assess learners. Their continuous assessment tasks are, however, limited to the chalkboard activities. There is no link to continuous assessment tasks such as projects where a learner's products can be assessed using a criterion reference system. Inspection of a sample of learners' exercise books shows activities of less than a page as constituting a project (paragraph 4.2.2.5)

5.2.1.7 Learning support materials in schools

The capacity of educators to be able to develop or adapt environmental learning materials to the needs of learners is crucial in the successful implementation of environmental education programmes. A variety of learning support materials such as books, posters, games and audio-visuals should be used. The design, layout and artwork, easy reading and language level are crucial for the successful use of the materials.

Learning support materials should be aesthetically appealing, gender neutral, factually accurate, interactive and allow learners to engage in the discussions on environmental issues. The textbook, for example, can be a guide to learning for learners, rather than just a carrier of information.

The research indicated lack of learning support materials (LSM) and interviews with educators revealed a strong belief that the lack of LSM severely hindered the implementation of environmental learning in Geography. The most common LSM mentioned was textbooks and many educators felt they did not have enough textbooks for all the learners. Without sufficient materials all learners may not actively participate in lessons. Although all schools visited had electricity, educators did not improvise or produce their own supplementary teaching/learning materials and, as a result, they could not suggest improvements for the future environmental learning materials.

5.2.1.7 Extracurricular programs and community support in schools

The school curriculum is already so full that there is little room to accommodate additional subjects. The curriculum implementation may not necessarily be limited to classroom activities but also to out-of-school programmes where learners engage in the learning process in a relaxed and practical way. Many schools in developing countries focus on enhancing the knowledge of the learners via the conventional one-way teaching method in the classroom. Literature has shown that learning can be enhanced by concepts such as ‘eco-school’ or ‘whole school approach’ to environmental learning where environmental issues are integrated into daily life of the school (paragraph 2.16). The school may have a plan of action in which they audit the use of environmental resources such as water and electricity.

There is also an increase in civil society groups and the addition of individual experts who have developed outdoor EE programmes and activities that can be applied to extra-curricular programmes of the schools (paragraph 2.18). Collaboration between non-governmental organizations (NGOs) and schools in this area is becoming more important in expanding the delivery of environmental education from the conventional style to field-based experimental learning. Extra-curricular programmes are better conducted with the local community. This approach is also more efficient when considering the limited resources available for schools.

The result of the empirical study showed that educators are not involved in substantial extracurricular activities. The only common activity cited was organizing learners to participate in school manual work days and, to a lesser extent, in tree planting and vegetable gardening (paragraph 4.2.5.1). Educators however expressed willingness to participate in environmental clubs if formed at their schools.

The quantitative research aspect indicated less involvement of educators in extra-curricular activities and very weak involvement of educators in the community EL activities. This was mostly evident in rural schools and with female educators. On the other hand, educators interviewed also indicated that parents are also less involved in the environmental learning activities for schools. The only involvement of parents was to lend garden equipment like hoes during the clean-up activities at school ground (4.2.5.2). Schools do not have special national and international environmental days integrated in their school planning. Only a limited number of schools participate in such days (4.2.6.3). It appears that educators see the school and 'outside school' activities as separate existences with no beneficial overlap or creative interchange.

5.2.1.9 School environmental policy

The majority of schools (91%) which participated in the research have no environmental education policy, action plans and EE coordinators. However, the policy is necessary to guide the development of action plans.

5.2.1.10 Continuous professional development of educators

Interviewed educators professed to have attended no workshops on environmental learning. This suggests that in-service development opportunities are limited (perhaps offered only in core subjects). Educators claimed they acquired knowledge through their own reading. However the quantitative data (self-assessment instrument) indicated that educators will need more professional training on assessment, fieldwork techniques, greening of their schools and philosophical underpinnings in environmental education. The professional development approach should be done in such a way that schools share experiences at cluster or circuit level. With this in mind, it appears that professional development for Geography educators should focus on current environmental aspects of the subject as well as pedagogy. Professional development activities focus on new ideas, creativity and reflecting on their own practice.

5.2.1.11 Learners' understanding of their environment

It seems very likely that the way people behave towards the environment will be very much influenced by what they perceive it to be. For example, do they perceive themselves to be part of the environment or separate from it? Our environment is our surrounding. This includes living and non-living things around us. The non-living components of environment are land, water and air. The living components are germs, plants, animals and people. All plants and animals adjust to the environment in which they are born and live. A change in any component of the environment may cause discomfort and affect normal life. Any unfavorable change or degeneration in the environment is known as 'Environmental Pollution'. We need to protect our environment to live happily.

Learners understand the term 'environment' as an area surrounding us (living and the non living) as conceptualized in the paragraph above (paragraph 4.2.6.1). Learners indicated environmentally 'good' things at their schools which included, among others, school cleanliness and tree planting. The environmental problems in their surroundings were cited as vandalism, pollution, uncontrolled wildfire and deforestation (paragraph 4.2.6.3). Learners also suggested solutions to such problems. The only limitation in learners' understanding of the environment is that they did not indicate that the environment influences 'development or growth'.

5.2.1.12 The role of the regional environmental education centre

The regional environmental education centre, run by the environmental education officer, should be a centre to support schools by providing resources to help integrate environmental education across all subjects, providing professional learning opportunities to educators and implementing more sustainable practices in schools and providing opportunities for learners' learning and environmental leadership (paragraph 2.18). Integrating the excursion experience into the learners' learning at the right point in the program helps to build a logical learning sequence and skill development for the learners. It also puts any knowledge developed prior to the excursion in a more meaningful context.

Through the environmental education centres, there is a possibility for linking and networking of clubs at local and national levels. This would multiply the educational effects by facilitating the information exchange and encouraging their activities.

The interview with the environmental education officer of the Ministry of Environment and Tourism in the Caprivi region maintained that there is no environmental education centre in the region. A plan is however, under way to construct two EE centres, one for the Caprivi and one for the Kavango region. The office is currently engaged with two schools on the outdoor and sustainable living programmes, so EE centres will be a considerable asset. The vastness of the area of responsibility and transport problems were cited as hampering the implementation of environmental education.

5.3. RECOMMENDATIONS

5.3.1 Recommendations based on conclusions from both studies

5.3.1.1 Knowledge and understanding of environmental education

- Educators should teach learners to view the environment in a holistic way by focusing on all dimensions of environmental education such as the biophysical, social, political and economic aspects of the environment. Environmental issues should also be interpreted in time and space. The emphasis should be on concepts, principles and processes. Local examples such as case studies should be used where possible.
- Learners should think globally while acting locally and be introduced to environmental issues which Namibia faces. These are biophysical issues such as water scarcity, climate change (drought and flooding), pollution, loss of biodiversity, degradation of life support system and food security; social issues such as epidemic diseases especially HIV and AIDS, rural-urban migration, conflicts over limited resources; economic issues such as development and poverty; and political issues related to public participation and corruption.
- Environmental issues should also be understood as systems (with inputs, processes and outputs) and they should be understood in spatial terms, in which learners interpret patterns and processes underlying landscapes at various levels.

- The curriculum should be flexible to include the local context and the educator's initiatives. The national curriculum should not negate educator involvement and focus on national control. There is a danger that the curriculum content will require learners to 'deliver' rather than 'interpret'. This could result in the approval of one set of knowledge and skills, leading many schools to become dependent on a single textbook with one particular series dominating.

5.3.1.2 Skills and attitudes

- Learners should be given the opportunity to develop environmental and geographical skills such as expression of ideas and observation through drawing/simple stories, collecting, classifying, analyzing and interpreting data and statistics, evaluating information from a variety of sources, identifying causes and consequences of environmental problems and seeking consensus when dealing with contested environmental issues. Learners should be able to identify significant places and geographical features using appropriate maps, photographs, diagrams and vocabulary.
- Learners should be involved in activities to take actions for the benefit of the environment through appreciation of nature and a concern for its quality, desire to work in groups, be open-minded and the ability to challenge pre-conceived ideas on environmental issues and claim their environmental right. More professional development programmes in EE should be organized at regional level. The freedom of an individual within a particular frame of natural and social condition is a pre-condition that can impact on people's environmental behaviour and therefore on sustainable development.

5.3.1.3 Teaching and learning strategies

- Teaching and learning should be interesting and relevant. It should engage and motivate the learners so that it connects to real-life, both outside the classroom and lives in the future. In addition, learning should focus on a deeper and thorough understanding of the content rather than surface or superficial learning. The emphasis on concepts, principles and processes demonstrates that the curriculum does not regard the teaching of geographic and environmental facts as important.

- Learning should be a social process, rather than simply a process of transmission, and talk or active participation is central to the process. Educators should involve learners in Value Clarification methods such as moral dilemmas which will also enable learners to be connected to the real world outside the classroom. This also tests the environmental convictions of learners. This is a way of fostering learners' awareness and training them how to reach a decision when faced with controversial environmental issues (responsibility and confidence).
- Learners should carry out individual or group project work. This will enable learners to engage in basic geographical investigations where they are expected to formulate aims, collect, analyse, interpret and present data on topic like litter or deforestation. This should be accompanied by practical action or recommendations to address the issues. The educator should monitor and guide learners throughout the process.
- Group work should be organized in such a way that there is substantial learning taking place. Educators should link the appropriate tasks to the curriculum, guide the nature of classroom activity, enable effective learner interaction, monitor and assess learners' progress and adjust classroom work to suit each situation. Learner participation will increase learner interest as well as providing opportunities for learners to 'discover for themselves' and learn from each other.
- The educator should provide specific support in the context of a learning task: modelling, praising effort, giving feedback, instructing and explaining, asking questions, simplifying, emphasising, making links/reminding and placing issues in context. Other methods such as role plays, simulation games, excursions, group discussion, pair-work and class presentation could be used.

5.3.1.4 Integration of environmental learning in subjects

- All educators should be trained on how to integrate environmental learning across subjects. Environmental issues are dynamic and schools should be able to respond accordingly.
- Co-operation and team work among educators in planning lessons and the field-work activities are recommended (sound school-based curriculum planning). This will avoid possible duplication which may cause learners to loose interest. The interest in EE will ensure that the social, academic and educational purpose of geography and other subjects is not neglected.

5.3.1.5 The use of outdoor activities and educators' perception of IK

- There should be thorough co-ordination of outdoor activities which cuts across subjects.
- Learners learn best through fun, joy and when they observe and experience how beautiful nature or culture can be in their local environment. Environmental clubs and school environmental policy could complement work in the conventional classes.
- Learners' outdoor activities should include the school auditing the use of its resources such as water, paper and electricity. Only sustainable development is a permanent remedy to droughts, famines and the dwindling bio–diversity on this earth. Outdoor education addresses learning objectives through guided, direct experience using natural and built environments as resources.
- Indigenous knowledge is a rich resource and a path to sustainable living which should be integrated in daily teaching of environmental issues in schools. We can learn from positive and negative aspects of indigenous knowledge.

5.3.1.6 Assessment

- The school mission should be to develop productive citizens. To be a productive citizen, an individual must be capable of performing meaningful tasks in the real world. Therefore, schools must help learners become proficient at performing the tasks they will encounter now and when they graduate. To determine if it is successful, the school must then ask learners to perform meaningful tasks that replicate the real world challenges.
- Schools should examine Assessment for Learning (AfL) in the context of education in Namibia and consider its relevance to improve the quality of education. Some practical AfL strategies that are currently used in developing countries could be considered. The greatest educational gain are made when learners understand the aim of their learning, how they progress and how they can achieve the aim (or close the gap in their knowledge). It is not an add-on or a project; it is central to effective teaching and learning.

- Educators should be trained in how to use criterion reference assessment systems when assessing environmentally-related projects. Educators should avoid the tendency to assess quantity of work and presentation rather than the quality or depth of learning. Assessment using the level description can be challenging and this requires capacity development of educators.

- Clear learning intentions/objectives should be shared and the success criteria should be negotiated with learners. Peer assessment enables learners to become self-critical and independent. The educator should talk with learners about their self-assessment and how well they met the criteria for success.
- Assessment should also emphasise the learner's individual growth and development as well as group participation in dealing with tasks of analysing and communicating with others as a team.

- Examination questions should be framed to reflect educator's use of their own examples to illustrate concepts, principles and processes.
- Educators should have time for peer observation and discussions, that is, moderation between educators and schools. There should be a collaboration with colleagues working on similar aims - wherever contacts can be made. Continuous assessment tasks in the geography syllabus should guide activities.

5.3.1.7 Learning support materials in schools

One might suggest that for educators to successfully implement environmental learning in Geography, sufficient and appropriate textbooks and reference materials must be made available to educators and learners. These materials should be in line with learner-centred teaching and provide activities and lessons to encourage active learner participation. Educators should also be trained in material development and adaptation because the needs of learners vary from region to region.

The materials should also reflect the contribution and perspectives of various cultural groups and encourage a positive attitude towards environmental issues. The material should provide tasks or questions for learners to practise skills or use knowledge in a variety of situations.

The material should help educators to create a classroom environment that welcomes learners' curiosity, rewards creativity, encourages a spirit of healthy questioning and avoids rigidity. The material should routinely include scope for learners to express, clarify, justify and represent his/her ideas.

Women and rural people should also be represented in the materials. Educators should aim to use the national guidance materials selectively and critically to support and enhance the educator's own planning, not replace it.

5.3.1.8 Extracurricular programs and community support in schools

- Educators should be engaged in extracurricular activities at school in order to supplement what is learned in the classroom. These may include field trips, gardening, waste management, green and energy saving projects. These should be integrated in a school's annual plans and the progress reporting/monitoring mechanisms established. The educators and parents should try to inculcate in learners, the knowledge about the environment and develop positive and healthy attitude towards the environment from the beginning of life.
- The community should be involved in the formulation of the environmental policies and participate in school decision making. The more aware and involved the community is the greater the likelihood of yielding fresh ideas on problems and their solutions.
- Educators and learners should also get involved in ongoing community-based environmental activities such as community education campaigns, drills to prepare for natural disasters such as flood, and water quality monitoring of local waterways. Educators should see out-of-class/school activities, hobbies and interests as feeding into their personal development and professional creativity.

5.3.1.9 The school environmental policy

- Schools should develop their school environmental policies and action plans which will guide the school activities. Schools could audit their environmental aspects in terms of sustainable practice at school level. School environmental policy is important because the school community will have an awareness and understanding of the effects of their actions upon the environment in which they live, work and relax. In order to do this, they need to take responsibility for their own actions and they need to have a sense of duty and care for the world in which we live.

5.3.1.10 Continuous professional development of educators

- In order to improve the quality of environmental learning in Geography, educators should take all opportunities which include creative involvement across a range of the area of work – with learners, other educators and stakeholders.

  In classroom: educators should focus on development of a variety of teaching/learning strategies and adapt learning support materials to meet the diverse needs of individual learners. *With colleagues in the school:* educators should engage in curriculum planning approaches which allow the school to take ownership and expand on national requirements, as well as promoting the subject to parents and learners. Peer coaching and proper induction of novice teachers should be done. *With other educators beyond school:* educators should reflect on each other's experience, sharing professional expertise, resources and strategies. *With subject colleagues:* educators should participate in exchanging of ideas or approaches and updating their own knowledge and skills on the subject at all levels, including research. *National bodies:* educators can contribute via national or local association and meetings to discuss the role of the subject. Educators become role model with their own communities.

5.3.1.11 The role of the regional environmental education centre

- The office of the regional environmental education officer (responsible for EE centre) in the ministry of environment and tourism should coordinate field visit programmes together with the ministry of education (synergy).

A regional inter-ministerial committee could be set up to facilitate these programmes. This will enable learners to develop an understanding of concepts such as conservation, preservation, beautification and stewardship. The schools involved will provide learners with a solid background in science, nature and global issues. Learners should be given experiences in nature in order to develop their sense of wonder, exploration and love for the natural world.

5.3.2 Recommendations for further study

The following are recommended for further study:

- Project work of learners from different schools should be investigated in order to look at the differences in standards, quantity and quality of work, including the nature of assessment applied. This will help to identify areas where educators need help and support.
- Studies could be undertaken to compare the application of environmental learning processes and methods in schools which participated in the SEEN pilot project (2001-2005) with those which did not participate. This may determine the extent to which EL issues are institutionalized.
- The extent to which environmental education is incorporated into National Standards and Performance indicators for Schools and Educators could be investigated in order to understand the current situation.

5.4 LIMITATIONS

One of the limitations of the study was that only five (5) schools participated in the qualitative aspects of the study and schools which participated were mostly rural schools. The classroom observation was not conducted to assess the extent to which actual teaching strategies, varying assessment methods and environmental integration were implemented in the classrooms. Learning support materials were not scrutinized to determine the extent to which environmental issues are covered and also the extent to which learning activities in the learning support materials encourage learner-centred teaching was not included in the study. The research could have been extended to include views of parents and others in the community.

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APPENDIX 1: Request to the director of education for permission to conduct research

Box 1442
Okahandja
10 September 2010

TO: CHIEF REGIONAL OFFICER
CAPRIVI REGIONAL COUNCIL

FOR ATTENTION: MR L. LUPALEZWI
DIRECTOR OF EDUCATION
DIRECTORATE OF EDUCATION

SUBJECT: REQUEST FOR PERMISSION TO CONDUCT RESEARCH FOR JSC GEOGRAPHY IN SELECTED SCHOOLS

This is to request for permission to conduct research in selected schools in the Caprivi region. The research is part of my study with the University of South Africa to look into the extent to which environmental learning in the Decade for Education for Sustainable Development (DESD) is implemented in JSC Geography in the Namibian curriculum.

Taking cognizance of how the exercise should not interrupt much of the normal school work, the data will be collected in two ways. The first is by means of a Self-assessment postal questionnaire to be mailed to all schools with Grades 8-10 classes. Educators will be expected to reflect on their own practice. When one does this kind of exercise frequently, it potentially leads to improvement of one's teaching practice. The questionnaire may take less than 30 minutes to complete.

Secondly, a researcher wish to conduct interviews with Geography teachers for Grades 8-10 at five schools (rural, peri urban and urban), including a focus group discussion with a group of learners. The regional office is kindly requested to identify these schools. The research study will benefit the schools and teachers since NIED will have a picture of their training needs in this area and plan for their continuous professional development. The envisaged date for school visits is 1-5 November 2010.

The result of the study will be shared, all research ethics will be observed.

Yours sincerely

……
Mr P. Simalumba

APPENDIX 2: Letter of permission to school principals

Box 1442
Okahandja
7 October 2010

TO: SCHOOL PRINCIPAL

FOR ATTENTION: JSC GEOGRAPHY TEACHER

SUBJECT: REQUEST TO COMPLETE A QUESTIONNAIRE FOR JSC GEOGRAPHY RESEARCH

This is kindly to request your school to facilitate the completion of the attached Teacher Self-Evaluation questionnaire / instrument which is based on environmental learning in JSC Geography (Grades 8-10). The Geography teacher is requested to participate in this survey and the regional office has been informed of this exercise. The research is part of my study with the University of South Africa to look into the extent to which environmental learning in the Decade for Education for Sustainable Development (DESD) is implemented in JSC Geography in the Namibian curriculum.

When one does this kind of exercise frequently, it potentially leads to improvement of one's teaching practice. The questionnaire may take less than 30 minutes to complete. All information on this study is confidential and no names of schools or teachers will be mentioned in the report.

Enclosed is also an envelop to be stamped and returned on or before 18 November 2010. Completed questionnaire should be addressed back to the above address or

National Institute for Educational Development (NIED)
Private Bag 2034
Okahandja

Yours sincerely

……..
Mr P. Simalumba

APPENDIX 3: Teacher Self-assessment instrument (postal)

Data gathering instrument (a) questionn+aire

A) <u>Teacher Self-assessment Instrument</u>

1. School code ……..

2. School social environment

1	2	3
Rural	Peri-urban	urban

3. Gender (IMark 1 if you are a mal and 2 if you are female)

1	2

4. Years of teaching experience (Croos the appropriate figure)

1	2	3	4
1-5	6-10	11-15	+16

4. Heading

Guide for Teacher Self-assessment

- The primary purpose of the Teacher Self-Assessment Instrument is for reflection on your own practice. When one does this kind of exercise frequently, it potentially leads to improvement of one's teaching practice.
- For the purpose of this study, the information will not be used to judge your practice. You are not identified when your responses go into the data base.
- All information on this study is confidential and no names of schools or teachers will be mentioned in the report.
- When rating your classroom practice from the criteria below, be as honest as possible. Thank you for your willingness to take part in this exercise.

<u>Rating scale</u>
4 = You are very confident about this indicator
3 = You are confident about this indicator
2 = Most of the time you feel unsure about this indicator
1 = The indicator is seldom or never found in the classroom or the school. You feel very unsure about this.

Place a cross in the appropriate space.

Indicator for Teacher	4	3	2	1
No.1 Knowledge about environmental learning				
1. I know factual information about environmental learning (EL) eg. Population, biodiversity, environmental degradation and risks				
2. I am knowledgeable about environmental challenges prescribed in the Curriculum Guidelines for educator on EL eg. Natural resource and their management, development and environment, globalisation				
3. I consider the environment in its totality – natural and built, technological and social.				
4. I know the MoE policies about environmental learning				
No.2 Materials and resources				
5. I use existing official materials/resources to teach EL related topics (eg. Textbooks)				
6. I produce and /or collect my supplementary materials/resources to teach EL				

related matters (eg. Posters, news articles, non official teaching materials, videos)				
No 3 Skills and attitudes				
7. I communicate the way people's cultural activities affect the environment (politics, society and religion)				
8. I communicate the way individual people affect the environment (individual actions and behaviour).				
9. I teach learners to identify their own attitudes and values toward an issue or the environment.				
10. I teach learners to be aware that there may be more than one way to solve environmental issue				
11. I teach my learners the skills they need to contribute to the health of the environment (participation, decision making)				
12. I teach my learners positive attitudes towards the environment and to appreciate the values of others				
13. I value cultural practices and indigenous knowledge which contribute to enhancement of environmental health.				
No 4. Teaching and learning				
14. I feel comfortable talking to my learners about EL				
15. I regularly use local environment to do practical activities				
16. I teach EL related matters in a learner centred way				
17. I use problem solving skills to identify specific environmental problems				
18. I teach learners the importance of identifying people or actors involved in environmental issues.				
19. I regularly consider ecological costs and benefits to designated solutions to environmental problems and issues.				
20. I continuously assess learners' tasks				
No. 5 Extra curricular and environmental action				
21. I am involved in extra curricular activities at school (sport, EL club, debate clubs etc)				
22. I communicate the need for responsible citizen action to resolve EL issues				
23. I communicate that there are various levels of environmental action (individuals, groups, organizations)				
24. I am involved in EL related activities in the community				

6. How does environmental education (EE) feature in the school?

	1	2
	Yes	No
25. The school has an environmental policy		
26. The school has an environmental action plan (not a policy)		
27. The school has an EE coordinator		
28. The school is committed towards teaching about environmental issues		
29. EE features in most learning areas (subjects)		
30. EE only features on enviro-days and special occasions		
31. EE is evident in practical activities such as recycling		

If your school has an environmental policy, respond to the following questions in no. 7 and 8))

7. What type of issues are covered in the school policy

1	**2**
Yes	No

32. School ground		
33. Ablution facilities		
34. Litter		
35. Water		
36. Health issues		
37. Waste reduction		
38. Energy saving measures		
39. Preservation of biodiversity		
40. Safety and security		
41. Use of environmental resources		
42. Integration of environment in the curriculum		
43. Establishment of enviro-clubs		
44. Celebration of enviro-days		

……

8. How do learners involved in aiming in achieving the outcomes of the policy

	1	2
	Yes	No
45. learning area projects		
46. In-school competition		
47. School fieldwork		
48. Community field work		
49. Classroom projects		

Others ……..

9. On which information sources do learners and teachers draw for environmental information

	Yes	No
50. Other teachers/educators		
51. Other learners		
52. Books and magazines		
53. Ministry of Education Resource centres		
54. Other government ministries		
55. Local community member		
56. Electronic sources		

Other ……..

10. In-service training needs

The list below shows some of the areas which are generally included in in-service training in EE. Select the top 6 in your opinion, and rank, in order of importance from 1 to 6 the areas that you would like to see included in in-service training

	Yes	No
1. Action research in EE		
2. Assessment in EE		
3. Local to global learning through themes		
4. Case studies on EE best practice		
5. Participation of learners in decision making		
6. Greening of the school ground		
7. Fieldwork techniques		
8. Philosophical underpinnings of EE		
9. Teaching methods in EE		
10. Environmental audit at schools		
11. Environmental education integration in curriculum		

Thank you for participation

APPENDIX 4: Teachers' focus group interview guide

Teaching and learning

8. What do you teach learners about environmental learning?
9. How do you become knowledgeable about environmental learning?
10. Describe how you teach about environmental learning related topics. Which activities do you use?
11. Describe how you integrate environmental learning in other subjects that you teach. Can you give an example?
12. How do you regularly assess environmentally related topics
13. May you list problems (if any) in the application of EE approaches
14. What is your perception on using indigenous knowledge as a teaching resource that could contribute towards efforts to prevent environmental degradation.

Skills and attitudes

15. Which skills (how to) do (junior secondary) learners need to have in order to contribute to the health of the environment.

Materials and resources

16. Do you have enough materials and resources to prepare for teaching environmental learning? What do you do if you don't find relevant materials?
17. Do you have any suggestions for the future environmental learning materials to be used for learners and teachers?

Extra Curricular

18. What extra curricular programs does the school have in the area of environmental learning?
19. Do you know teachers who would want to be in environmental awareness club advisor/facilitator? Would you want to do it?
20. In which ways is the school community supporting EL initiatives at school?
21. does your school participate in the celebration of the National and International environment Days e.g. Arbour Day. If yes please describe how it is done.

Questions from participants

15. Do you have any questions for us on any matter related to environmental learning?

APPENDIX 5: Questions to local Environmental Education officer

1. How do schools use your office to promote environmental knowledge, values and attitudes?
2. What challenges and opportunities do the regional environmental learning office encounters with regards to implementation of environmental learning policies.

APPENDIX 5: Interview schedule for learners

1. What do you understand by the term ‘environment’?
2. What do you like about your school environment?
3. What do you like worst about the school environment?
4. What environmental issues or problems are found in and around your school?
5. What do you think can be done to address these problems?
6. What classroom environmental learning activities do you enjoy most in classroom?
7. How often do you have outdoor activities/classes
8. Do you usually celebrate environmental days at school
9. Do elders at home tell you to look after the environment?
10. What environmental project did you participated in at school?
11. Do you have anything extra comment about the school and the environment

APPENDIX 6: Verbatim Script for interviews with educators from schools in Caprivi

A. Educators

School 1: Senior Secondary School
School 2: Combined School
School 3: Combined School
School 4: Combined School
School 5: Combined School

SCHOOL 1 (Senior Secondary School educator)

This is an urban located school with grades 8-12, having approximately 600 learners and 21 teachers

Welcome to school A and now I am conducting interview with the geography teacher. We are going to move 15 questions divided in four main themes which are: teaching and learning; skills and attitudes; materials and resources and extra curricular activities. You are requested to answer questions as honest as possible.

What do you teach learners about EL?

I teach learners about EL on how they should conserve and protect their environment. Learners learn also much about these through topics which are in the syllabus eg. global warming. There is no way to talk about the destruction of the environment without talking about global warming. Learners get more knowledge about this because it is in the syllabus. What should be done to protect the environment and including the consequences of their actions when destroying the environment. If the environment is destroyed, people will not live because oxygen will not be available. Carbon dioxide will be high in percentage, which is global warming.

What do you exactly teach about global warming we are now talking about? I teach learners what it is, why it is an environmental problem, causes and the impacts it has on plants and animals and solutions too. But this is also a complex topic for learners to understand. *Why?* because it involve other environmental issues. *What about the use of natural resource?* Limited natural resources, we are always able to take these learners out to see the environment. We sometimes refer to verses in the bible so that learners can think on how god for example created this environment and see changes created by human beings today, in search for survival. Is there anything you teach you wish to add? No! but I also teach about population increase in areas such as towns because of movement of people and problems they cause to towns for example. *Ok!*

How do become knowledgeable about EL

One can have knowledge on EL through studying, many books through. We were also taught about EL. We read books, like in Geography grade 10 we have a chapter on ecology. We deliver the content to learners because we were taught and sometimes we have some min-workshop sometimes 5 days so that we may have thorough knowledge on how the natural environment functions. We are also helped by information from the Ministry of Environment and Tourism (directorate of forestry). *You referred that you were taught, does it include courses during the time you were trained to be teacher?* Yes but most of the knowledge came after I started teaching, books I started reading.

Describe how you go about teaching environmental learning related topics. Which activities do you use.

Laughing! We base our teaching on theory first. We give information and use the chalkboard so that learners can understand. We do practical, by giving learners a chart to draw a village. Technically, I tell them to reflect back, draw the village how it looked like 10 years ago. Learners again draw the same village on second diagram how it looks like currently (now). They will realise that some of the trees are no more (cut), deforested. Through these activities learners can see what happened to many tree we had as a result of high population. Now you give them precaution that of want they should do eg talking to parents, headman on the consequences of what people are doing.

They can also go to the environment itself or in the forest to learn something near the village. Tell them that this area was a forest, a habitat with animals and full of birds and other living organisms or this area was a farm. If you make a research you will see that some areas were even farms. They can interview elders to tell them how the environment changed. May be certain living organisms were there, but now they are gone. Some of the field may no longer be used and the soil is more barren or infertile.

Describe how you integrate EL in other subjects that you teach. Can you give an example?
As a cross curricular activities it is integrated in many subject like Life Science, Agriculture and Geography. You will get that in Geography learners learn about Global warming, vegetation like pastures in Agriculture. Learners are taught that if the area is destroyed, animals will not find pastures or survive which is Agriculture. In Life Science we talk about percentage of different gases in the atmosphere, if we burn the vegetation there will be much carbon dioxide in the atmosphere. It is subject related. Learners should get this across subjects.
But is there any coordination between teachers at school level when planning (joint planning) for environmental learning teaching since we teach the same child? Ahh, I am not quite sure. But the planning itself should be the same, each teacher plans his own lesson.

How often do you regularly assess EL related topics?
Assessment, mostly it depends on the teachers presenting the lesson or offering the subject. We in Geography give them activities like individually or in larger group. If it is in groups, learners' participation is important and can be observed and assessed. Sometimes it is practically learners should be able to demonstrate. Learners write activities from the board, and you have to control. There should be assessed continuously. *Why should you assess learners continuously?* I order to see if they understand and also to record marks for continuous assessment.

May you list problems (if any) in the application of EL approaches
Problems! There are always there. We don't have photocopy machines because as a senior secondary school there are many learners and resources are limited. Also the other problem is the help, where to get information on EL, although the Ministry of Environment is here they would sometimes tell you we are too busy and we are doing this and this. Learners sometimes need to hear information from a visiting official like from the other ministry and municipality, just for a change. *What about taking learners to the conservancies, national parks, river side?* That one, like Salambala conservancy. The biggest problem is transport, we don't have school transport. We rely on private sector and government and one can apply for transport through the ministry but always difficult to succeed. One time they said they bus was coming collect learners to take them to the Zambezi river for observation, but they did not come. But learners could gain more through knowledge if could be exposed in the field through a structured program.

What is your perception on using indigenous knowledge as a teaching resource that could contribute towards efforts to prevent environmental pollution, degradation?
On this question? In our culture we say you cannot learn without asking the elder people. How they lived and how they continue to live. There are many trees that are in the environment but we don't know them and how they were used. Some are natural fruits which cannot be cut by cultural practice. Some trees are used for medicines and elders never uprooted the whole tree to get a piece of root. Elders only dug one side of the trees and covered it with the soil as a form of conservation and sustainability. These practices are slowly dying out because people are making business out of roots for medicines. *What about tales and traditional songs?* If you listen to certain song they praise certain trees and their areas which had diverse animals, the use of animal skins. One can feel these things during the Annual Traditional Festivals in which schools and cultural groups from the community are recognised by giving prices. Environmental related dramas and songs are part of criteria when judges look at the meaning of songs. *Thanks*

Which skills (how to) do Junior secondary school learners need in order to contribute to the health of the environment.
They need a lot of skills eg. Not cutting down trees which is deforesting. If you cut one tree you should plant another one. Plant a fruit tree a home. The habit for throwing paper should not be allowed where ever they go, whether on picnics'. They should know that for example plastics can endanger animals. Environmental protection is very important. *Is that all?* Yes

Do you have enough materials and resources to prepare for teaching environmental leaning? What do you do if you don't find relevant materials?
Materials are not really enough. Textbooks are not there, sometimes only a teacher has a book. As a teacher you have to copy an activity on chalkboard. At times you take them to the real environment to observe something.

Do you have any suggestions for the future EL materials to be used for learners and teachers?
Materials should just be more for the learners. Instead of only textbooks, charts are very important to use in classrooms too.

What extra curricular programmes does your school have in the area of environmental learning?
Every year we have National Arbour day where all schools assemble somewhere to be addressed by officials from the Ministry of Environment. They talk about the importance of trees. Communities nowadays have committees to protect their local forests/trees and one needs a permit to cut trees (and pay a fee). All these people usually come to talk about sustainable use of resources on Arbour day.

Do you know of any teachers who would want to be in EL club. Would you be one of them?
Yes I know most of the teachers eg those teaching Life Science, Agriculture and Physical Science. They are interested. I am also interested. But we don't have one here.

In which ways is the school community support EL initiatives at school?
School is supporting through giving information to learners. Parents too help learners when we prepare for annual cultural competitions. They prepared song related to the environment and learners have to demonstrate (drama) how they lived, hunted animals using bow and

arrows. They learn more about the environment. *Which other way of community support can you think of again?* Maybe other support cleanliness for learners at home.

Does your school participate in the celebration of the National and International environmental days e.g. Arbour Day. If yes please describe how it is done?
Yes as i mentioned earlier, the school participates, specifically the Arbour day. We are always invited with other schools. Our schools are always preparing songs and dramas. The regional official will give official speeches. Parents are also invited to attend.

……

SCHOOL 2 (Combined School educator)

This is a peri-urban school 2 km south-east of Katima Mulilo, having grades 1-10 with approximately 300 learners and 12 teachers

Welcome to school B and I am conducting the interview with the geography teacher. We are going to move through 15 questions which are divided in four main themes which are: teaching and learning; skills and attitudes; materials and resources and extra curricular activities. You are requested to answer questions as honest as possible. The information will be confidential.

What do you teach learners about EL?
Thank you opportunity! To answer your question I might elaborate a bit or go back to the syllabus. I first look at the competencies for the syllabus. One can find broader topics on degradation of the environment, key issues like deforestation, desertification. Natural deterioration of the environment. So basically that is what I emphasize on. *Apart from deforestation and desertification, what other environmental issues do you teach learners in geography?* Ahh! I also teach about pollution of the environment and population issues to learners.

How do become knowledgeable about EL
One becomes knowledgeable, in my case I was trained to teach in Geography and environment issues are part of that. On top I also used to compile extra materials on environment in essence. There are documentaries on the television especially National Geographic on Multi-Choice channels, issues like acid rain and the effects thereof, global warming and the role of human beings

Describe how you go about teaching environmental learning related topics. Which activities do you use.
Well! Ahh, I teach EL related topic in diverse ways. I feel there are many approaches. It is first better to teach from learners' experience, their roles using examples from the local environment. You can let learners imagine the changes in a village which had trees. The learner should put himself in that position to understanding what is going on. These are activities I use.

Describe how you integrate EL in other subjects that you teach. Can you give an example?
Unfortunately I only offer Geography, but I also offer Religious and Moral Education (RME). RME syllabus has also strong environmental aspects in many religions, events which happened in e.g. Hindu, Islam, Christianity. Nearly all subjects. For example a river played a role that Moses survived when the Israelis cross the river Jordaan according to the bible, which is the environment which protected him. You can also look at the rules and laws of Judaism or how people lived in their communities in Islam. *But do you do joint planning with other teachers when teaching?* No, we don't do that.

How often do you regularly assess EL related topics?
I assess in many ways. You should first let learners to be aware of the environmental biodiversity, to understand the environment. I give home works, test in order to see if learners understand the topics. I do assess most of the time but sometime it is oral methods.

May you list problems (if any) in the application of EL approaches?
Basically the first problem is that environmental learning is a wide subject e.g. We can talk of animals like Kudu. Learners may naturally see such animals as something to kill for food. I takes time to make learners to change their mind sets and appreciate nature. If a Hare crosses here for example, it will be chased by learners. *What about taking learners see other natural and beautiful areas (wilderness)*? The problem is transport. One can put a transport request but it dies a natural death. But going out can also take only half a day e.g. when taking learners to the river to see some forms of erosion, water pollution instead of just learning from the textbook. They (learners) can just donate N$10.00 each. *Is there any other problem you wish to add?* No!

What is your perception on using indigenous knowledge as a teaching resource that could contribute towards efforts to prevent environmental pollution, degradation?
Ahh, like I was implying before, IK can be helpful because this is how we were brought before if it is strengthen and driven in the right direction in terms of how one prevent environmental degradation. I think this can be a perfect solution to most environmental problems we have. One can amplify on positives. But it is tricky because some of the IK activities can be negative eg. if the communities practised monoculture. *Can you give an example of cultural and traditional practice which can benefit the environment?* An example is how elders used to change pastures, when taking cattle to the riverside for four months and taking the cattle to higher grounds to rest the land and let grass to grow again when it starts to rain. This was done to allow grass to recover (kind of a rotational grazing). These were good practices in our communities. *Okay, but do people still use these things?* No only a few.

Which skills (how to) do Junior secondary school learners need in order to contribute to the health of the environment.
Well, on HIV-AIDS when kids are made to be aware, they have a know-how on how to protect themselves. Again these are forms of knowledge and skills they have to apply e.g. Littering, they should know why it is not necessary to through anywhere. Better farming techniques they learn at schools should be applied at home. During dry seasons they should know when to increase the number of stock and that when it is drought the can sell off some of the animals in order to limit the loss and they can do that when they are adults.

Do you have enough material and resources to prepare for teaching environmental leaning? What do you do if you don't find relevant materials?
Well materials will never be enough since EL is a broader area. It depends on what is available. If one does not find relevant materials, there are government officials like from Ministry of Environment and Tourism. They can come to give materials and lessons. On HIV we have a clinic and there is a nurse next here who is always invited give materials and offer her expertise. *Do you have access audio-visual materials?* I use video cassettes and fortunately we just received a television donation you see there, with a satellite dish and I follow all programs like National Geographic can have many documentaries on conservation. I usually record them on videos and play them when I teach an environmental related topic eg on earthquakes and conservation of wild animals.

Do you have any suggestions for the future EL materials to be used for learners and teachers?
Not exactly, but provide charts

What extra curricular programmes does your school have in the area of environmental learning?
We do have gardens which we usually cultivate vegetable, with the help of Agricultural Science teacher, through it only happens certain time of the year

Do you know of any teachers who would want to be in EL club? Would you be one of them?
Yes I think teachers can be interested but only when one tries to involve them. The environment is important. We live in the environment; I don't think there are people who will say they don't want to be part of the club because it is like biting the fingers which feed you.

In which ways is the school community support EL initiatives at school?
Ahha! Well, when we clean the school, parents normally borrow implements like hoes to learners to come and use. Otherwise there are no many ways they are involved here.

Does your school participate in the celebration of the National and International environmental days e.g. Arbour Day. If yes please describe how it is done?
It used to be done, as you have seen when driving into the school, you look at the left side. This was done on the National Arbour day we planted these trees the blue gum. But now we are failing again.

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SCHOOL3 (Combined School: teacher)

This is a rural school 45 km east of Katima mulilo, has grades 1-10 with approximately 450 learners and 14 teachers.
Welcome to school C and now I am conducting interview with the geography teacher. We are going to move through 15 questions which are divided in four main themes which are: teaching and learning; skills and attitudes; materials and resources and extra curricular activities. You are requested to answer questions as honest as possible.

What do you teach learners about EL?
Ahha! Geography is in fact an environmental subject. Because most of the things we teach concerns the environment. We teach how to conserve the environment, when we talk about problems which affect the environment: deforestation, overgrazing, overstocking, land degradation, soil erosion and so on. They are across the grade in the syllabus for geography grade 8-10. And then we do also talk about diseases or pandemics which affect animals, including HIV and AIDS which affects the people. We even go as far as teaching about the economics, when need to develop we use renewable and non-renewable resources. How successfully we can use these to make sure we conserve the environment for the future generation to use the resources too. These are some of the things we teach about environment

How do become knowledgeable about EL
First, I came to know through a natural way. We have seen many things from the time we were young and in that way we started learning about the environment. The mother could tell me clean your shirt, I could see elder brothers and sister cleaning. Learning about the environment is a common thing and when go to schools is just to add on what we learned home. I was trained, I remember our lecturer during training telling us to compile EL resource books where we could discover, analyse environmental issues. We could feel things ourselves.

What about continuous professional development programmes like workshops?
Workshops in our context are not done, teachers' meeting are there sometimes but we don't specifically discuss environmental issues. Since I started teaching in 2005, I attended only two workshops for Geography and unfortunately they were not specifically on EL. So workshops are not conducted often.

Describe how you go about teaching environmental learning related topics. Which activities do you use?
In my classroom! How you teach learners depend on the availability of materials that you have. I could choose different topics about problems which affect the environment. I will tell one group to define deforestation, the other group define overstocking and the other group define bush encroachment. I give questionnaire. Give them home work and they later come back they tell us about the result of the task I give them. What is the result if we cut trees or overstocking. This year there was a group which come from regional office for cleaning campaign. And as a Geography teacher I went out with learners to collect litter, and learners learned that some garbage are biodegradable while others are not. They learned of waste materials which can be recycled, sorting of garbage.

What about visits to Nature conservancies, I see your school is located less than 20 km from Salambala Conservancy? We did not yet have a visit like that but this year we initiated a visit to Salambala but failed because of transport problems.

Describe how you integrate EL in other subjects that you teach. Can you give an example?
Let me give an example, i teach one of the non-promotional subjects, that is, Art and Culture. Art and Culture uses the surrounding resources to develop items out of local materials. We collect garbage, newspapers, tins, bottles and produce things. In the way we are encouraging learners collect garbage from the school surrounding, cleaning as a way of integration and use the waste materials.

How often do you regularly assess EL related topics?
Ahh! I always use home work, test. I assess them by using group work. I produce with them a questionnaire to guide their work on a project. We can use questions for example a concept on deforestation which they have to search for answers. The marks which they get are recorded and often give exercises to learners

May you list problems (if any) in the application of EL approaches?
Those are problems but they are not difficult. Sometimes learners are hearing the topics for the first time and if you use group work, you will need to explain first. Their prior knowledge need to be cultivated first. You have to change the method of teaching though sometimes. *Is that the only problem you encounter?* No! language can be a problem also. Learners may not express themselves or read a textbook with understanding.

What is your perception on using indigenous knowledge as a teaching resource that could contribute towards efforts to prevent environmental pollution, degradation?
I just said that learning about the environment used to start at home with parents. Learning through IK is always a beautiful way because our parent used to do that before. Let me give an example, the library we had, we once conducted this project, by telling learners to collect medicines in forms of herbs and exhibit them in the library on the wall. They used charts to paste roots and leaves on charts. They give name of the plant from which a piece of root or leaf comes from and explain how it is used, how the tree looks like. We also collect garbage and classify them and explain how they can be disposed. Plastics bag which people use are not indigenous.

Which skills (how to) do junior secondary school learners need in order to contribute to the health of the environment.
Learners need to be talk. You know just yesterday I was just clarifying to learners the difference between hygiene and sanitation to learners. Learners need the skills for cleaning using different detergents. When they want to clean different items at home, what do they use? They need to have a clean environment. *What about the importance of biodiversity?* They should be able to differentiate between those which can be decomposed or not.

Do you have enough material curricular and resources to prepare for teaching environmental leaning? What do you do if you don't find relevant materials?
I don't know whether they are relevant or not but it depends on how you use them. The syllabus is there, books, subject policies, year plans are relevant. Textbooks are not enough especially in the class. I have 63 learners with 10 textbooks in Geography grade 10. I don't give these textbooks to learners. I go from one class to another with these books. Some times I make copies of diagrams from books as a solution so that learners can work in groups. We do not have charts, videos cassettes. *What do you do if you don't have?* One can borrow videos from teacher of other schools

Do you have any suggestions for the future EL materials to be used for learners and teachers?
I will suggest if more textbooks are given to schools. I wonder why some subject like Science and Arts are provided with textbooks. Sometimes we run copies for learners by using funds from our salaries. Writing summaries on chalk board waste time. If we could use transparencies just to project and learners writing it could be good.

What extra curricular programmes does your school have in the area of environmental learning?
We only participated in clean up campaign but it was only once. I remember at the time that it was organised with participation from the traditional court (Khuta)

Do you know of any teachers who would want to be in EL club. Would you be one of them?
I don't know. But I like the principal and I don't know maybe because we are neighbours. Every step he take I see. And I see every step he takes. I remember we once organised learners to clean papers which were trapping on the school flowers, fence and fences for teachers' housing. I feel he can lead in that endeavour.

In which ways is the school community support EL initiatives at school?
I did not yet see the project initiated by the community, but what I know is in individual houses we cannot find much litter which means they are doing something. We use trees and grass for building and that has become too much. The community used to seen burning refuse but I think they are not informed. We see learners coming with clean uniform because of parent contribution. If learners come from here they should apply that knowledge. I remember the local traditional court (Khuta) also one time invited the school learners to participate in a clean up campaign in the area.

Does your school participate in the celebration of the National and International environmental days e.g. Arbour Day. If yes please describe how it is done?
No for now
……

SCHOOL 4 (Combined School: teacher

This is a rural school located 60 km east of Katima Mulilo along the Ngoma main road connecting Namibia to Botswana through Ngoma border post. It has Grades 1-10 with approximately 300 learners and 13 teachers.

Welcome to school D and now I am conducting interview with two geography teachers. We are going to move through 15 questions which are divided in four main themes which are: teaching and learning; skills and attitudes; materials and resources and extra curricular activities. You are requested to answer questions as honest as possible. Information will be confidential and no name of the school or participant will be revealed.

What do you teach learners about EL?
Teacher A: ok! It is broader term. There are many issues which are under the topic EL like in ecology: we talk about pollution, deforestation, overgrazing. And also a topic like population geography is an environmental learning topic. *Anything else?* Teacher B: yaah! Maybe the same. Also when it comes to climatology, this topic should be linked to environmental related activities e.g. areas which receives rain and those which do not receive more rain. Learners can look at the nature of trees (e.g. tall or short) to determine the rainfall prevalence in the area.
What do you focus on if you teach deforestation? Teacher A: in terms of deforestation, learners should be able to know why it is an environmental problem for example, what is deforestation?, what is its causes and how can we solve them. Learners should be taught the idea of sustainability. People cannot do away with population as an environmental issue (ignoring) because people are moving, creating new homes and farms and that has an impact of natural environment. They should know that if you cut one tree you plant the other.

How do become knowledgeable about EL
Teacher A: okay! as teachers we are encouraged to read every day to get more knowledge. We read newspapers so that we know what is happening in our communities or the country. I borrow the books from the library to read and search for information to teach learners. Teacher B: we have the internet today, we can get the information to take to classes. Teachers that are at this school also have the information and knowledge on environmental learning, so they can share with us.

Describe how you go about teaching environmental learning related topics. Which activities do you use?
Teacher B: if I come to a topic in a syllabus we require them sometimes to move out. We for example go and see a river erosion at a bridge at Winela border post between Zambia and Namibia. If it is about pollution, they can go out to find a polluted area, discuss what can even be done and they even be later involved in cleaning the local surrounding.
Teacher A: in the classroom, I normally I give them an articles with questions which are environmental related. They read and answer the questions, we discuss together.

Describe how you integrate EL in other subjects that you teach. Can you give an example?
Teacher A: in language we can teach people on a topic like over-fishing which is in Geography grade 10 and also relevant to communities of the Caprivi floodplain. It is apparent here that people use nets of smaller size, even mosquito nets to catch fish. I will tell them to write the letter of an issue (why it is becoming a problem), together with a letter of complaint to the relevant authority. In that way they learn how to write (skills) while

addressing an environmental problem. Teacher B: in Silozi language learners can write a letter to the Ministry of Environment to complain how the elephants are destroying their crop fields. In that way they learn spelling and grammar rules.

How often do you regularly assess EL related topics?
Teacher A: first through questions based on the environmental topic. Sometimes just orals. In grade 10 I always give projects on ecology. They go out and see and then compile the project. They can also do a project on the local community especially on rural-urban migration. They can find out who are the people most leaving to towns, are they female or male and which age group. The can find information from parents and write a report. Teacher B I do continuous assessment using tests and other practical.

May you list problems (if any) in the application of EL approaches?
Teacher B: Problems are always there especially when you go in the class. When you go in the field you have to warn learners of dangers for example when visiting a river. Transport to visit other places is transport. *Anything to add?* Teacher B: lack of materials like textbooks is a problem.

What is your perception on using indigenous knowledge as a teaching resource that could contribute towards efforts to prevent environmental degradation?
Teacher A: okay I think, it is of importance to use IK. You will find that sometimes we should invite those people in the Ministry of Environment to come and lecture our learners. If they go in the field and have many information local knowledge they can come share. Our learners should get information.
Teacher B: Yaah. Indigenous people, we should draw from them for example, the local traditional leaders in a village (Indunas) earlier were empowered on local government level to guard against uncontrolled wild-fires. Learners can know that wild-fire is not part of the cultural practice. But certain practices can be changed e.g. littering if it happened in a community. We can benefit from other aspects of indigenous knowledge.

Which skills (how to) do junior secondary school learners need in order to contribute to the health of the environment.
Uuuuh! Learners should be interested, told the consequences of environment. They have to have cleaning campaigns like once every month. There is proverb " a healthy mind in the healthy body" Just like the environment, learners should clean their environment. *What about the importance of biodiversity?* Learners should be encouraged not to cut down trees, they should love nature around. Cockroaches and vultures are important to human beings.

Do you have enough material curricular and resources to prepare for teaching environmental leaning? What do you do if you don't find relevant materials?
Materials are not enough, especially in Geography. Learners share textbooks to some extent that five learners share one textbook. A solution is that we do copy an activity from the text book for them to do activities in groups. We don't have videos on earthquakes, volcanoes.

Do you have any suggestions for the future EL materials to be used for learners and teachers?
If you people can think of us and provide materials on biodiversity, I saw some when I was at NIED. Many posters cover environmental topics.

What extra curricular programmes does your school have in the area of environmental learning?
Teacher B: There is only school manual work programme where we do cleaning once in a week, for two hours in the afternoon. (*Teacher A nodes in agreement).*

Do you know of any teachers who would want to be in EL club? Would you be one of them?
Teachers at this school are aware and willing. All what we need is encouragement from the management to start the club and keep it alive.

Does your school participate in the celebration of the National and International environmental days e.g. Arbour Day. If yes please describe how it is done?
Yes we participated on a day organised by the Ministry of Agriculture. *Do you integrate these special days in your annual school programmes.* No. here we ignore some of these things and we concentrate more on examination.
In which ways is the school community support EL initiatives at school?
No maybe if we introduce EL clubs.

Do you have any other question on us
How will you going to help the schools? Information gathered may help with future planning on professional development of teachers.
……

SCHOOL 5: Combined School: teacher

This is a rural located school, 40 km south of the Town of Katima Mulilo. It has grades 1-10 approximately 300 learners with 14 teachers

What do you teach learners about EL?
Alright thanks. EL is a contextual subject that aims at imposing the living area where people are found. So this is to be taught to learners to realise the needs within their environment and of how to take care of their environmental. The focus is on sustainable ways to managing their environments. *What topics do you teach?* It is ecology, the one that tackles environmental problems. It deals with the ecosystems, where people, living and the non-living do integrate themselves.

How do become knowledgeable about EL
We know about the environment itself gives the lesson to us because it is surrounding us. We see some of the natural processes that describe how to have sustainable environment

Describe how you go about teaching environmental learning related topics. Which activities do you use?
The environment itself is a good example that we should know how we associate with ourselves environment, of how we teach. It is a experience based examples, daily interaction between learners, where they live and are expected to learn from what they know. For example deforestation, learners can go outside, down the forest the classroom to see. They know that they used to collect fire-wood, you can give reference, if they cut down trees and have to know what happens. *In a classroom which activities do you use?* One can give a

topic and activity, and learners work as individuals and group work. Learners may answer questions related to the topic either in groups or individuals.

Describe how you integrate EL in other subjects that you teach. Can you give an example?
Has to do with relating Environmental topics in the other subjects taught so that learners are aware of all corners that EL is found in all subjects, instead of only geography. This is to make learners aware that environment is everywhere

How often do you regularly assess EL related topics?
It is individual and group assessment. This is to find out how much learners know or understood from the topic presented. At times, it is difficult to give all assessment tasks required by the syllabus. Little tasks we give learners can just be converted to real marks, as long as they get prepared for final examinations.

May you list problems (if any) in the application of EL approaches
Alright! Problems may be there because some problems are not from the local environment of learners e.g. When we talk of industrial pollution, learners may not be familiar with such things. They may not understand the topic. *What do you usually do in such case where you teach about industrial pollution?* They are not used to industrial perspectives; use sources like pictures, visual aids should be used.

What is your perception on using indigenous knowledge as a teaching resource that could contribute towards efforts to prevent environmental pollution, degradation
This would also help because the environmental problems encountered, is something realised by other individuals, e.g. Deforestation can result into flooding, everyone knows.

Which skills (how to) do Junior secondary school learners need in order to contribute to the health of the environment.
This may include individual and group skills that everyone must apply. They must know the environment itself in deep, the effects of what they do, misuse of the environment and how to manage it. *You mentioned of group cooperation?* They should be high cooperation because there is no way to achieve sustainable development, eg. If they do not have to through bottles. If individuals are involved and the majority through bottles, the image of the town will not improve.

Do you have enough material curricular and resources to prepare for teaching environmental leaning? What do you do if you don't find relevant materials?
Materials are not such enough. We need materials to support the support the subject. It is my duty to look after materials. I collect things such as Videos, projectors, the can use radios, TV.

Do you have any suggestions for the future EL materials to be used for learners and teachers?
Ahhah, yes. I suggest that schools should be provided TV to support environmental subjects, so that learners can be able to see. Learners should be able to see environmental problems in other countries. If we talk of environment, what is happening in other countries may affect our country e.g. Global warning.
What extra-curricular programmes does your school have in the area of environmental learning?

We usually plant trees during Arbour day. That is why we have green trees, we collect small trees and plant even though some are natural, they need to be taken care of

Do you know of any teachers who would want to be in EL club. Would you be one of them?
Yes, they are willing, e.g. For Life Science and Agriculture

In which ways is the school community support EL initiatives at school?
They do not support

Does your school participate in the celebration of the National and International environmental days e.g. Arbour Day. If yes please describe how it is done?
Yes, Arbour Day only. People do tree planting. We also plan clean up campaigns

APPENDIX 7: Verbatim transcript for focus group discussions with learners

SCHOOL: 1 LEARNERS

This is an urban located school with grades 8-12 with approximately 600 learners and 21 teachers

Welcome to school B. Dear learners I am conducting a research on the implementation of environmental learning in Geography Grades 8-10 in the Caprivi region. I will ask you eleven questions and you are requested to answer and participant in the discussion as honest as possible. The information is confidential. The names of the participants and the school will not be revealed.

What do you understand by the term "environment"

Learner A: Environment is everything around us. Learner B: it is the natural environment which is surrounding us, nature created by god. *What is it are saying as "everything around us"?* Learner D: these are things like the soil we plough, plants, birds even fish in the river. *Is there anything other learners can add to the question?* No that is all. *ok*

What do you like about your school environment?

Learner E: I like many trees at the school. We sit under trees (shade) when it is hot. Learner B: I like most is the orchard which prevents soil erosion. *Can you explain how the orchard prevents soil erosion?* Learner B: because the soil is not open to wind and when water falls during the rain time. Learner F: I also like beautiful flowers planted in the right order which makes our schools beautiful. Learners D: It also provides mangoes fruits which we usually eat. Learner E: Also I like the beautiful loany/grass where learners usually sit and eat during break times.

What do you like worst about your school environment?

Learner A: what is like worst is litter, littering is one of the problem, and it caused by learners. B: The soccer field is full of gravel and when we play there is dust and learners can be injured. C: The floor for our classes are not in good conditions are full of pot-holes, when we sweep, the classroom cannot be cleaned properly. D: When teachers punish learners they used to tell them to uproot trees which is not a good thing. E: Soil erosion is also a problem around the school because some areas have few trees. *Other learners, do you have other things you like worst about your school?* No, just the same. *Okay*

What environmental problems or issues are found in and around your environment?

Learners A: Litter, Cutting of trees without planting some. Learner B: Ground pollution because of papers and tins outside next to the fence. Also air pollution. Can you explain how air pollution is caused here?. This happens when people burn the papers and garden refuse they contribute to carbon in the atmosphere. Learner F: perfumes realise dangerous gasses like CFCs which damage the ozone. Learner E: yes also disposals cause gasses from refrigerators to pollute air. Learners C: cutting of trees which suppose to absorb carbon and realise oxygen contributes to global warming. *Do you have other problems you might have forgotten? Learners are all quite.*

What do you think can be done to address these problems?

Learner A: problems like littering, they should provide bust bins but also should be provided with information so that people should not litter. *Everyone has a responsibility*. Learner B: they should buy perfumes which do not contain dangerous gasses but ozone friendly (CFCs).

Plant one tree if you cut one is a better way. Learner D: Educate people how to protect their environment. *Do other learners wish to add on some of the solutions to address problems we mentioned earlier? Burning of garbage?* Learner F: people should decompose garden refuse the refuse and papers.

What classroom EL activities do you enjoy most in the classroom?
Learner A: How to save water. *Can you expand on that one*. When we learn for example that if our tapes are liking we are going to pay more. Learner B: How to use energy appropriately. Learner C: We learn that we have to recycle water to water the plants after washing clothes. Learner D: Bottles can also be recycled and should be collected and taken back. *What classroom teaching methods to you enjoy most?* Learner F: when we work in group and share information. *Anything to add to he has said? Learners shack their head to signal that it is enough for them.*

How often do you have outdoor activities/classes?
In once month in a month, like last term, we went out to see litter is done in the local area with the geography teacher.

Do you usually celebrate environmental days at your school?
All learners No? only Arbour day. Yes the Arbour day

Do elders tell you to look after the environment?
Learner A: Yes. They tell us not to through bottles because we will be hurt. Learner B: We help the mother to clean the courtyards. Learner D: We also learned about Lilalanda in makete (environmental health) from parents. Learner F: They always tell us not to burn garbage but to decompose / burying them. *Learner C how do your parents tell you to look after the environment?* Also not to cut trees

What environmental projects did you participate in at school?
Learner E: Web had a project on behavioural change (HIV-AIDS) at the Teacher Resource Centre (TRC) last term. *We participated group discussion and drama. Other learners nodding in agreement, yes, yes behavioural change at TRC.*

Do you have any extra comment about the school and the environment?
We teach you so that where ever you go people must know that you have knowledge for environmental protection. Linking want you learn e.g.,. Sustainable use of energy resources, water etc. At school level we need learners to learn by experiencing nature or biodiversity e.g. Bird watching. What do we do if we educate people to take care of their environment but they litter even if we put bust bins on the open market? *It can be difficult and town we do have rules and regulations which can be enforced. People do have structures in communities where they report their grievances.*

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SCHOOL 2: CS LEARNERS

This is a peri-urban school 2 km south east of Katima Mulilo, having grades 1-10 with approximately 300 learners and 12 teachers

Welcome to school B. Dear learners I am conducting a research on the implementation of environmental learning in Geography Grades 8-10 in the Caprivi region. I will ask you eleven questions and you are requested to answer and participant in the discussion as honest as possible. The information is confidential. The names of the participants and the school will not be revealed.

What do you understand by the term 'environment'
Learner A: environment is where living and non-living organisms are found. Learner B: environment is the surrounding where all animals and human beings live. Learner C: where everything interacts and depends on each other. *Other learners, do you have other ideas to add on what others have said?* No!

What do you like about your school environment?
Learner A: our school environment has the fertile land where we can grow/cultivate vegetables. Learners B our school environment is very clean. It is cleaned everyday by cleaners. Learner F: our school environment is admired by learners from other schools and usually they take transfer to be here. Learner D: I like many trees around the school and provides us with shades. Learner C: we can get fruits like lemons from our trees. Trees can provide polls for the fence.

What do you like worst about your school environment?
Learner A: the worst I like is the way resources are used e.g. water is usually running from the tap and we waist water. Learner B: cutting of trees around the school ground every time. *Why do you cut trees?* We usually cut the trees. Learners and sometimes the principal tell them to cut. Learner C: the classrooms are not well, they are too old and there is smell from the ceiling. Learner F: the fence is not correctly erected. Learner E: the garden is not protected and it is in the open and animals can damage crops.

What environmental problems or issues are found in and around your environment?
Learner A: deforestation, many people around the environment are cutting the trees in the communities as source of fire-wood. Learner B: air pollution. *Can you explain what it is and why is it a problem?* People burning papers and smoke from rubbish which goes into the atmosphere and affect people. Learner C: soil erosion. *Can you elaborate on it?* When trees are cut down maybe the wind will be blowing or rain washing away the soil.

What do you think can be done to address these problems?
Learner A: Stop cutting too many trees. *How?* By using the Ministry of Forestry to tell the people about the importance of trees. Learner B: Provide enough tapes to provide water to many learners not only one tap it can be broken. *What can we do with air pollution you mentioned earlier as a problem?* Learner D: People should recycle papers instead of burning. Learner F: maybe to burry the other in the ground. A*ny person who wish to add the other solution?* No!

What classroom EL activities do you enjoy most in the classroom?
Learner A: working in group-work when we discuss things and then we report to other learners in the class. *All learners nodding to support!* Learner B: Working in pairs. *Why do you enjoy pair work?* Because we share ideas with colleges in the class.

How often do you have outdoor activities/classes?
No! *(all learners)*

Do you usually celebrate environmental days at your school?
All learners Noooh!. *You don't celebrate environmental days?* Yes *(all learners)*

Do elders tell you to look after the environment?
Yes! *All learners. Can you explain how?* Learner A: they tell us not to cut our trees because they take out carbon dioxide and provide oxygen. Learner B: they tell us to use water in a good way because without water one cannot survive. Learner C: to clean the grass so that snakes to not harm us. Learner E: they always tell us not to cause wild-fire in the forest because it kills small animals. Learner F: they always tell us to clean our hands and dishes so that we don't get diseases.

What environmental projects did you participate in at school?
Learner A: only gardening, by using spades in garden. *Is this all, what other projects can others remember at school?* Learner F: only that one and we sell vegetables that sell and get money.

Do you have any extra comment about the school and the environment?
Nothing!
……

SCHOOL 3: CS LEARNERS

This is a rural school 45 km east of Katima Mulilo, has grades 1-10 with approximately 450 learners and 14 teachers.

Welcome to school C. Dear learners I am conducting a research on the implementation of environmental learning in Geography Grades 8-10 in the Caprivi region. I will ask you eleven questions and you are requested to answer and participant in the discussion as honest as possible. The information is confidential. The names of the participants and the school will not be revealed.

What do you understand by the tern 'environment'
Learners A: Environment is everything around us. *Like what? can you expand on that?* Learner A: trees, people, animals, air and a lot of things. Learner B: environment is about things that are with us and around us like land, trees, waters, air and they also create environment. Learner C: things around us like living organisms, air and water.

What do you like about your school environment?
Learner A: I like the trees which provide us with oxygen and take up carbon dioxides. Learner C: I like our school because it is clean, nothing can injure. Learner F: I like our

school because there is nothing polluting the air, clean air around the school. D: because we have clean fresh drinking water. E: Teachers teach us to be clean

What do you like worst about your school environment?
Learner A: our toilets. They are always dirty, there is no roof and the wall is written with chalks. Learner C: some people are using the floor as toilets. Learner B: The orchard is not taken care of. Learner D: Some class roofs are leaking when it is raining. *Anything other learners wish to add on what is mentioned?* No!

What environmental problems or issues are found in and around your environment?
Learner A: Littering. When you look around you will find papers. Learner B: In the communities you will find that some pipes are broken and water is coming out and wasted. C: Deforestation in our area, they cut trees, some people are cutting many trees. D: toilets in the communities are liking which are polluting (smelling) the air and the environment.

What do you think can be done to address these problems?
Learner A: May be we have people to be advised to stop cutting trees and not to throw things away but put garbage on one area so that they can be taken. Learner B: Education and awareness.

What classroom EL activities do you enjoy most in the classroom?
Learners A: I enjoy going out of the classroom like looking at trees and insects. Learner B: I enjoy the learner-centred way of learning in which everybody has knowledge, participate in teaching instead of the teacher being the only one talking and just use the chalk board while we listen. Learner C: I enjoy going out of the class and learning how to water the garden out side the class. Learner F: working and watering in the garden is very nice because there is fresh air. *But do you use sustainable methods to save water in the gardens*? We don't know!

How often do you have outdoor activities/classes?
No! only in Physical Education when involved in activities to exercise our bodies and when there is a investigation to do outside the classroom in Agriculture

Do you usually celebrate environmental days at your school?
No! *(all learners shaking their heads)*

Do elder at home tell you to look after the environment.
Yes. *(all) What do they tell you?* Learner F: they tell us go clean the dishes. Learner B: they always tell us not to kill elephants so that our children should also come and see animals. Learner C: they tell us not to cut trees because our children will also need to come and use them. *They should not finish. Anything which other learners wish to add?* Learner D: It is just the same

What environmental project do you participate at the school
We always work in the garden of our school. We sell vegetables and the income goes in the school account
Do you have any extra comment about the school and the environment?
Not really! *Thank you very much*

……

SCHOOL 4: CS LEARNERS

This is a rural school located 60 km east of Katima Mulilo along the Ngoma main road connecting Namibia to Botswana through Ngoma border post. It is has Grades 1-10 with approximately 300 learners and 13 teachers.

Welcome to school C. Dear learners I am conducting a research on the implementation of environmental learning in Geography Grades 8-10 in the Caprivi region. I will ask you eleven questions and you are requested to answer and participant in the discussion as honest as possible. The information is confidential. The names of the participants and the school will not be revealed.

What do you understand by the tern "environment"
Learner A: environment is the area around our school and in the school. Learner B: an area where people live. Learner C: environment is an area where animals and people are found. Learner D: environment is the area where living and non-living things live. *And lastly what can you add?* No answer!

What do you like about your school environment?
Learner A: I like plants because they provide us with oxygen. Learners B: I like plants which attracts tourists. Learner D: I like the way our teachers teach us. *(Learners are quite). Do you have something to add?* NO!

What do you like worst about your school environment?
Learner F: I don't like when people throw papers around the school. Learner E: the toilets don't look good, they are dirty. Learner B: domesticated animals used to play around the school. C: soil erosion is a problem in this area. Learner D: people coming from flooded area of Zambezi to higher land cut down trees for houses and fields. Learner E: Littering is another problem, there are no dust bins around Cuca-shops. People throw bottles after drinking. People cut trees and burn them when making fields and that creates smoke pollution in the atmosphere.

What environmental problems or issues are found in and around your environment?
Learner A: too many animals grazing in this area and the cause erosion. Learner B: cutting of trees and litter. *Okay we might have covered some in previous question!*
What do you think can be done to address these problems?
Learner A: Providing dust-bin at Cuca-shops and other public areas. Learner C: People must go to the Ministry of Environment to buy small tree and plant them to replace the one they cut. Learners D: educate people on how to look after their on environment. *What other solution can we think of? Quite. okay*
Learner F: when we going out and observe how gardening is done. When the teacher is teaching about littering, we usually go out to see for ourselves. Group-work is used and we communicate with other partners and discuss issues.

What classroom EL activities do you enjoy most in the classroom?

Learner A: Sometimes! When we go out to do gardens and see how gardens are prepared and cared. Learner F: like when we deal with littering we always go outside. Learner B: Group work when we communicate with partners in groups and discuss topics in the classroom.

How often do you have outdoor activities/classes?
Learner D: when we study clouds, wind direction etc. B: Last week afternoon we were out on the Trans-Caprivi Highway next to our school and doing projects on traffic counts for Geography. *What else?* Nothing!

Do you usually celebrate environmental days at your school?
Yes sometimes, participated in HIV - AIDS day in Katima Mulilo by playing dramas, songs and stories. Which focus on care and awareness.

Do elder at home tell you to look after the environment.
Learner A: Yes, they tell us not to make wild-fires because it will pollute the air. Wild-fire can kill plants and small animals. *What else?* Learner E: they tell us not to cut all trees in the field because when we harvest we use the trees as sheds. And also the leaves save as compost manure when they fall on the ground. Learner C: not to graze animals on one land for a long time without changing from that area to another. *Do you have any information you wish to add?* No!

What environmental project do you participate at the school
General cleaning of the school

Do you have any extra comment about the school and the environment?
No!

SCHOOL 5: C S LEARNERS

Welcome to school E. Dear learners I am conducting a research on the implementation of environmental learning in Geography Grades 8-10 in the Caprivi region. I will ask you eleven questions and you are requested to answer and participant in the discussion as honest as possible. The information is confidential. The names of the participants and the school will not be revealed.

What do you understand by the tern "environment"

Learner A: Environment is the place where plants and animals are found. *Another learner who wants to add!* Learners B : The environment is everything or something around us e.g. rivers fields, roads even the classes. Learner C: The area where living and non-living organisms are found. *What do you mean by non-living?* I refer to soils, dead plants, grass and others. *Any learner who wants to expand on the understanding of the environment!* Learner D: I do have the same idea of the place around only. *Ok*

What do you like about your school environment?

Learners E: What I like about my school environment is that our school is clean and we always everything is kept well. Why do you like a clean school environment? Because there are no snakes or mosquitoes which can bite us and learners can play freely. *Others are laughing!*

Learner B: I like the school environment because we have plants which provide us oxygen and the take-in carbon dioxide. *What will happen if plants are few at your school and did you plant these trees*? We will have less oxygen and too much carbon. No we only planted some of the trees but we take care of them by watering them and pruning them. *Next learner, what do you like most about the school environment?*

Learner C: I like the school environment because we have the sports field where learners play football and netball. Our teachers also teach well, especially how to take care of the environment. *Why is the sports ground make your school special?* That is where we play soccer every Wednesday afternoon and we do exercises during the period for physical education. We usually compete with neighbouring schools in sport and our parents usually come to watch us. *The last learners, any thing you wish to add!*

Learner D: just a lot of activities like playing soccer where teacher used to take us. Learner E: Playing soccer.

What do you like worst about your school environment?

Learner A: what I don't like about my school is that my school environment does not have the fence. *Why do you like the fence?* The fence is to protect the school building from animals and thieves. Animals usually damage our outside building and trees around the school. *Learner B what can you add!*

Learner B: what I like waist about my school environment is the lack of toilets. *Do you mean the school does not have toilets and people use bush when nature calls!* No they are toilets but they are not enough, they are only three for all learners and it is difficult for all learners to use them during break time. Toilets are also not clean but dirty. *Next!* Learner C: what I like worst about my school environment is that the Grade 1 learners have a small play ground, our orchards looks dirty and not watered. *But why is a small play ground for grade1 a problem?* It is because when they play they make noise for other classes and they cannot be taken to the sports field. *And the orchard, why is it dirty as you said and do you take care of the orchard?* Sometimes. *Ok*

Learner E: What is don't like is also that toilets are dirty. Ahaa! Everybody is about dirty toilets but who should be responsible for cleaning of toilets? Cleaners. *But do learners know how to use them properly*. Some do not know how to use toilets properly

Learner E: what I do not like about my school environment is that many learners sometimes do not come to school. *Why?* When it is time for rain they decide not to come to school and they look after cattle when elders come to school to receive money old people. *Old age pension!* Yes. *Anything any of you wish to add!* Nothing. Others nodding their heads.

What environmental problems or issues are found in and around your environment?
Learner A: the environmental problem found in our area is deforestation – the cutting of trees. *Explain how it happens and why is it a problem?* These people here cut trees to make timber for selling and sometimes build the courtyards. They do not plant trees but just cut. They fell the whole big tree instead of cutting just a branch. *Another opinion!*

Learner B: Another problem is that people are burning grass or making wild fires and animals are left without grass. *Let us look at wild-fire as a problem, apart from animals not getting grass to graze what else is bad about wild-fire.*
Learner C: Small animals and insects in the ecosystem cannot run faster and can be hurt or killed by fire. Their living standards become worse in the grass and trees are burned. Learner F: when burning the area, the Carbon dioxide will be produced and make us suffer from cancer. *Ok!* Others are nodding heads in agreement. *What other problems apart from the one we mentioned are prevalent in our area?*

Learner D: the other problem is dumping or littering, when people are drunk they through away bottle anywhere and that is not good. *Let us expand on this on, why are bottles dangerous*? Bottles can injure people and our animals when they are broken, if you step on it. People fighting can also use bottles to injure one another. *Any addition on litter!* Quite! The next problem in your area yes the next person.

Learner E: The other problem is vandalism, when we knock off from the school, some people come back to school and steal or vandalise. *Are these people learners?* We don't know but it seems they are learners who misbehave and three boys were caught and punished for that. Do you have a school security person during night? No only in the holidays there is a care taker.

What do you think can be done to address these problems?
Learner A : According to Vandalism, it is better to fence the school. B) For deforestation, wild-fire and others, we can educate people in homes on the impact of doing those things like wild-fire. *What else!* D) People must not through bottles away when they are drunk. They should have dust-bins to through bottles. *What else on alcoholism again, are bars open all days!* Bars are open even on Sundays from morning to evening.

What classroom EL activities do you enjoy most in the classroom?

A) We enjoy when the teacher is teaching about living organisms, they teach us how they produce, reproductive and how we affect them. B) We enjoy most in those activities, when teachers allow us to go out and study outside on our own, talking about natural resources like plants. C) when the teacher is talking

How often do you have outdoor activities/classes?

A) May be only once in a month. When you do something like? Like clouds and when we go in the orchards.

Do you usually celebrate environmental days at your school?

No

Do you have any extra comment about the school and the environment?

Do elders tell you to look after the environment?

A) Yes they tell us, those who are educated. Keep your body and environment clean. But those who are not educated will not.

B) They tell us to clean our bodies, courtyards and beds. E) They ell us not to cut trees. C) Like my parents, does not allow burning or playing with fire. D. For me I don't have anything extra

What environmental projects did you participate in at school?

Gardening, we plant sugar cane and tree plants in the orchard. *What do you get from that?* Aah! Usually nothing.

APPENDIX 8: Verbatim for Environmental education officer in Caprivi region

CAPRIVI REGION: ENVIRONMENTAL EDUCATION OFFICER

Welcome to Katima Mulilo in Caprivi, the Directorate of Environmental Affairs (EE Unit) in the ministry of Environment and Tourism. Madam, I will ask you a few questions concerning the implementation of EL in schools. How your Ministry/directorate assist schools in term of environmental education. You are requested to answer as honest as possible. Information obtained will be confidential.

How does your office promote environmental knowledge, values and attitudes

Thanks you for the visit and interview. First of all we are working with both Primary and Secondary schools as well as to some extent, elders. Firstly we are involved in taking schools for environmental learning tours to local National Parks. In Secondary schools we found some environmental topics in the subjects which we help learners to understand when schools request our office for help. EL is also taught in forms of tours and requests usually come from both primary and secondary schools. We take them to the parks and after the visits we don't leave learners like that but they are expected to share want they learned with fellow learners who could not have the opportunity/ make it. In the field they use standard questionnaires to record what they learn and discuss in groups. Back home they even go on local radio for more discussions to share what they have seen. We want them to appreciate the work for environmental scientists.

Ok who normally pays for these tours? It depends, some of the school learners contribute certain amount, just for food or local business people help. They (schools) usually apply for transport from the transport office of the line ministry (Ministry of Education). But when we reach the Park they use vehicles from the Ministry of Environmental Affairs like the ones you see parking there, for game drive.

Do you have specialised or structured forms of programmes for learners visiting the Local Parks e.g. for two day to keep learners busy and learning? It is two fold, sometimes the school comes with the list of things they want to do, this and that. The schools which come with the list, we usually build a programme based on their needs. For the schools which want to go for the sake of tour, usually, we give them different activities e.g. we give them an overview of the park, practical which involve tree identification exercise around the office (by looking at the leaves, branches), we give them precautions because we have dangerous animals, they do game drives, when we get animals we stop and start to discuss with them what these animals are and how they behave, and so on. Those are activities we do.

Apart from taking them to natural environments, do you sometimes take learners for short tours in build up areas in the town to observe and discussion local environmental learning issues with learners? I did not start yet because I just started last year. We have environmental clubs at schools like St Kizito College where they are planting vegetables and an orchard for indigenous trees used as medicine. Another school which work closely with us is the Sangwali Senior Secondary School which has a project on recycling, but they haven't gone far because of lack of equipments. We are planning to assist them write a proposal and see if they can get funding from supporting NGOs.

What challenges and opportunities do the regional environmental learning office encounter with regards to implementation of the environmental learning policies.

They are a lot because I work alone in office. I have to cover two regions, that is, Kavango and Caprivi region which are bigger regions with more 600 schools. The main problem is transport, I could cover some of the communities. There is no Environmental Education Centre for these two regions and plans are underway to construct and EE centre in all 13 regions in Namibia. Currently the nearest is Katjikona EE centre in Otjozondjupa and Namutoni EE centre in Oshikoto.

Most of government functions are in the process of decentralisation, what about support you get from the Local Authorities and Regional Councils on the implementation of EL?
Not much involved, I don't know whether they are aware of the Unit or not. But the Town Council yes, especially the Tourism office, we are planning a project on waste management.

Any opportunity? Which ways do you reach many people on environmental awareness issues apart from the radio. Caprivi in terms of conservation is now divided in three parts: Mudumo North Complex, which is the side of Kongola coming this side, Mudumo South Complex, the side of Sangwali coming up to Linyanti and the third one is Eastern Flood Plain Complex. So it is easy for example I sometime attend these complex meetings or run workshops in these complexes. They sometimes invite me. They usually meet on a quarterly basis.

Are local schools aware of your office in case they need a lesson from an expert on any environmental issue or materials? How do you market yourself?
Like this year, I participated in the National Science Fare. That was a good thing. We were given a stand and that was real marketing because from that time, people or schools were calling the office for assistance on environmental issues. *What do you do when you need extra materials?* There are colleges in Windhoek. I usually call our library in Windhoek material assistance like charts, videos.

ANNEXURE 9

Summary of activities for Geography Grades 8-10 from a sample of learners' exercise books

Note: activities not arranged according to grade.

School	Activity-topic (classification)	Comments on length, mark allocation and quality
1	Weather and climate (exercise); Drawing a campus direction (project); Calculation of a range (practical); Measuring distance Word puzzle on weather elements and instruments (project); Drawing of different types of clouds (project); Using linear scale to calculate distance (exercise) Converting scale of a map; Tropical deserts (class test); Drawing of the solar system (practical); Air pressure systems Renewable resources: water (exercise); Difference between renewable and non-renewable energy sources; Investigating the uses of trees; Population Countries of SADC on map;	Exercises were too short. They were mostly half a page in length and learners seem to only provide few words for an answer instead of interpretation. Activities classified as projects may not qualify to be projects because they were too short and they could be done as classroom activities which could be completed in 15 minutes. A project in Namibia contexts is an enquiry into a geographical issue – leading to action in case of environmental issues. Map-work activities are good practical activities but there is evidence for an investigation into a use of local a resource except water and trees. Criteria reference assessment methods were not used in any activities classified as projects. Some activities were not marked.
2.	The use of weather instruments; Converting scale of map; Day and night equinoxes (exercise); Labour (exercise); Sustainable use of water in households (practical) Hydro-electric power (test); Forms of condensation; Working with contour lines; Physical features of a contour map; Cross sections and inter-visibility; Photographs; Population and census	Some of the activities could not be classified in any of the continuous assessment activities of the syllabus, that is, topic test, practical exercise, projects. Activities were too short to allow learners to engage with the topics. Only two activities could be classified as projects but the criteria reference assessment method was not used in any case. Only a few activities were pencil marked. Overall, learning activities were too few for learners in classroom for 8 months.
3.	Drawing a campus direction (not classified); The use of weather instruments; Measuring distance; Climatic graphs (mean, total and range); Advantages of solar energy (exercise); Photographs;	Activities were too short (5-10 marks) and few for 8 months learners were at school. Not even one project was given, thus no evidence for criterion assessment method was used.

	Contour lines and landforms; Tropical savannah region; Population map (exercise); Investigating child labour; Types of rocks (test)	Practical activities seem to be of better quality since they are skills oriented and data handling. Most activities were marked by peers (fellow learners)
4.	Measuring weather (exercise); Cross section and inter-visibility; Drawing of a wind rose (exercise) Seasons of the year Drawing of water cycle (project) Forms of condensation; Examining equatorial region Solar system (test) Investigating soil erosion Major features of the world (major mountains and rivers) Air pollution (test) Map-work revision test.	Activities counted for 10 - 15 marks, usually on one page. Activities were not properly classified whether practical exercises, topic tests or projects) The activities on soil erosion seem to have a better length and relevant project but the criteria reference marking system was not applied. Though project work is visible, they cannot also be classified as product for learning All activities were marked.
5.	Directions and cardinal points; Weather instruments; Identification of clouds on pictures; Photographs; Investigating the solar system (practical); Layers of the atmosphere (drawing) as a project; Water day project; deforestation Countries of southern Africa; Classification of settlements Water and soil erosion (exercise) Water pollution	Activities were too short (5-10 marks) and few for 8 months learners were at school. Not even one project was given, thus no evidence for criterion assessment method was used. Some activities were not marked