THE ROLE OF SCHOEMANSDAL ENVIRONMENTAL EDUCATION CENTRE IN THE DEVELOPMENT OF ENVIRONMENTAL AWARENESS IN ITS NEIGHBOURING SCHOOLS

By

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I declare that

THE ROLE OF SCHOEMANSDAL ENVIRONMENTAL EDUCATION CENTRE IN THE DEVELOPMENT OF ENVIRONMENTAL AWARENESS IN ITS NEIGHBOURING SCHOOLS is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references.

…… ……..

H D MUDZUNGA **DATE**

DEDICATED TO

My parents

NTSUNDENI & NYAMUFUWI

My wife

AZWINDINI

My son

VHUHWAVHO

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Summary.

The role played by Schoemansdal Environmental Education Centre (SEEC) in the development of environmental awareness to its neighbouring schools has been established, described and explored.

Schoemansdal's role was evaluated in relation to what other environmental education centers around the world are doing as strategies of developing environmental awareness to their neighbouring schools and communities.

Schoemansdal Environmental Education Centre acted as a case study and its findings are supplemented by valuable data from seventeen schools, which were selected in the Zoutpansberg West Circuit by the researcher. The sole aim was to enhance information gathered at Schoemansdal EEC with regard to its role of making the neighbouring schools aware of environmental issues.

Although the research question has been adequately explored, the study does not claim to be exhaustive and without limitations. The recommendations made by the study, based on the findings will be of value to environmental officers, environmental educationists, teachers and education policy makers involved with EE implementation in formal education.

Keywords

Education, Environment, Environmental education, Environmental education Centre, EECs' roles, Awareness development strategies, Development, Awareness, Environmental awareness.

ABBREVIATIONS

BDF	Bophuthatswana Defence Force
Bop	Bophuthatswana
CIER	Centre for Indigenous Environmental Resources
DEAT	Department of Environmental Affairs and Tourism
Dep. Fin. & Env. Aff	Department of Finance and Environmental Affairs
Dept. Fin. & Econ Dev.	Department of Finance and Economic Development
EE	Environmental Education
EEC(s)	Environmental Education Centre(s)
EEF	Environmental Education Facility
EMPC	Educational Multipurpose Centre
EO(s)	Environmental Officers
SEEC	Schoemansdal Environmental Education Centre
Unibo	University of Bophuthatswana

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CHAPTER 1

ORIENTATION.

1.1. Introduction

The duty of guaranteeing a harmless and life-enhancing environment as stated by Constitutional Assembly, (1999:11) has been enthroned on the 'organs of the state' with an interest in environmental affairs. Organs of state according to Burge (2003:59-60) are bodies performing public functions in terms of legislation, which in our situation such functions are in line with environmental issues

The above-chosen organs of state are obliged by The Environmental Management Act in Burge, (2003:62-63) to establish procedures and institutions, which will facilitate and promote public participation in environmental governance.

In putting the act into action they set up environmental education centers (EECs). They operate as educational institutions promoting environmental education through offering programmes, which yield environmental knowledge, attitudes, skills and behaviours, which are not harmful to the health or well being of people.

What motivated the researcher to study the role of EECs in creating environmental awareness will form the first part of this work. The statement of problem will also outline some findings of research based on educational programmes yielding environmental awareness.

The next section deals what this research aims to achieve both in the form of research aims and objectives. The following section handles an outline on the type of research, which will be undertaken in this study.

Several concepts, which have a bearing in understanding our research, will also be clarified in order to have a common understanding of the concepts. The chapter concludes by outlining the programme of the research project.

1.2. Motivation of the research.

Being an educator myself, I experienced lack of concern for the environment within the pupils of today. Schools fences are broken and trampled upon, school grounds are littered and trees in the yard are being cut down such that participants and spectators of any field activities are exposed to sunrays without any shade to their rescue.

From that situation the researcher thought that teachers seem to be used and have accepted those abnormalities such that they will not and are not doing anything about it. The researcher thought that if they could get an external assistance from other professionals who understand the situation better, that will do. Environmental education was seen to be of an appropriate external assistance because according to Mostafa Tolba in Unesco, (1977:6) it is seen as a means of creating awareness of the complex and urgent problems of the environment as well as a basis of solving them.

According to DE Jager, (1995:24) conservation related professionals, need to contribute to EE through working with local schools in creating awareness of their

schools and surrounding environments and help with the abating of existing environmental problems. As EECs are full of such professionals, the researcher thought that EECs would be in a better position to help schools in doing that.

In view of the above conclusion, Schoemansdal EEC was chosen from a pool of EECs known to the researcher. The centre was chosen together with its neighbouring schools from Zoutpansberg West Circuit. The centre was chosen because it is within the proximity of the researcher. The researcher wants to investigate the type of environmental awareness developing programmes, which the centre does with or to its neighbouring schools with an aim of creating environmental awareness in them.

1.3. Problem of the study.

Taking into consideration that teaching and learning about the environment is a new field in South African educational context (Le Roux and Maila, 2004:243) much has to be learnt from other countries and research already conducted about such matters. Because of the task being new, all organs of the state having an interest in education, which can help in disseminating information, could be used in making people aware of such environmental teaching. That could be realized through what Wilson and Martin, (1991:13) and Burge,(2003:4) called ‘networking’ whereas Maila and Le Roux, (2004:240) call it ‘partner support’.

Networking and partner support refer to the working together of institutions having a common goal with an aim of achieving that specific goal (Wilson & Martin, 1991:13, Burge, 2003:4). In our situation our goal is teaching and learning about, in and for the environment and the type of networking we are interested in

is between environmental education centers and schools. EECs as centers to which people turn in order to get information and guidance about a wide range of environmental concerns (Wilson & Martin, 1991:4-5) will be mentoring schools in order to attain that desired level of teaching and learning in, about and for the environment

According to the findings of Le Roux and Maila, (2004:240) from their Science Outreach Programme, things contradicting what EECs are supposed to do are what is found. One of the constraints they found concerning the support of environmental learning was the lack of coordination of partner support between EECs and schools. That leaves us with a question as to whether are EECs acting as support partners in guiding the environmental education process such that both teachers and learners could attain environmental awareness.

According to Shongwe, (1997:3) there is a lack of information about EECs and what they are doing both in and out of the country with England as one of them. Little is also known and published about Schoemansdal Environmental Education Centre's role of being a support partner in creating environmental awareness in schools.

Because of lack of such known and printed information the problem of the research is that it seems Schoemansdal EEC is not creating environmental awareness to its neighbouring schools at Zoutpansberg West Circuit.

1.4. Hypothesis.

Schoemansdal Environmental Education Centre does not play a role in the development of environmental awareness in its neighboring schools.

1.5. Aim of the study.

The aim of this study is to establish the role, which Schoemansdal Environmental Education Centre plays in the development of environmental awareness in its neighbouring schools.

1.6. Objectives of the study.

The objectives of this study are:

(i) to state different environmental programmes put in place by Schoemansdal EEC with an aim of creating environmental awareness.

(ii) to evaluate if the programmes put in place do succeed in creating environmental awareness.

1.7. Research design and sampling.

Different authors have defined research differently. For example, research is seen by Schumacher and Macmillan, (1993:28) as a scientific, systematic and critical inquiry, study, examination, investigation or experimentation carried out with an aim of discovering new facts or revising accepted conclusions through collecting and analyzing data.

Webster in De Vos, Strydom, Fouche, Poggenpoel & Schurink (1998:45) viewed research as a study, inquiry or examination which is critical and exhaustive in its investigation or experimentation aiming at discovering new facts, revising accepted conclusions or applying new or revised conclusions.

Webster & Kerlinger in De Vos, Strydom, Fouche' & Delport, (2002:48) define it as a systematic, controlled empirical and critical investigation of natural phenomenon, which is being guided by theory and hypothesis about the presumed relations among such phenomenon.

Research, for the purpose of this study is seen as a systematic and critical way of investigating a problem such that substantiated conclusions are reached whose facts could be applied in new situations requiring such information.

Research design could either be qualitative or quantitative. Qualitative research design is chosen for this research project. The research is qualitative for it intends to observe, discover, describe, compare and analyze the type of awareness generating strategies that are put in place as qualitative research design aims at doing that (Searman, 1987:169). Qualitative research describes what is occurring in a given place at a given time, which is what the researcher wants to determine

(i.e. whether environmental awareness is created or not) (Van Maanen et al in Schulz, 1991/2:22).

Qualitative research is chosen as per its definition by Schumacher & MacMillan, (1993:372) that it is a naturalistic inquiry, using non-interfering data collection strategies for discovering the natural flow of events and processes and have participants interpret them. This summarizes what the researcher intends to do which is hearing how teachers interpret the activities of Schoemansdal EEC (i.e. whether they have changed their view (perception) of the environment) as the aim of qualitative research design is understanding social phenomenon from the participant point of view. Because qualitative research design does not involve manipulation of conditions or experiences (Schumacher & MacMillan, 1993:37) and environmental awareness should results in complete change in attitudes, knowledge and behaviour, qualitative design could be used in this regard.

1.8. Clarification of concepts.

The following concepts shall be defined for the purpose of this study. They are: awareness, development, environment, environmental awareness, environmental education centre and environmental education

1.8.1. Awareness.

Awareness according to Guralnik (1971:52) is defined as becoming conscious, knowledgeable or cognizant of an occurring act, object, idea or concept. According to Opie & Schuil (1993:18) awareness refers to understanding the changing world we live in, skills, which will help us, adapt and cope with coming challenges occurring.

It is further defined by Allers (1997:19) as becoming conscious of a learner of an object, phenomenon or event in the environment, while recognition of the characteristics of these environmental elements may be almost entirely lacking. Awareness from an environmental perspective includes making an individual conscious about the physical, social and the aesthetic aspects of the environment he occupies as stated by Ignacimuthu (1998:300). Awareness according to Kavanang, (2002:74) is defined as having knowledge or perception of a situation or fact.

For the purpose of this research awareness shall be defined as an act of becoming conscious of the changing world we live in, in its totality (i.e. its physical, social and aesthetic dimension), develop feelings and thoughts about, and know the skills which will help one in adapting and coping with challenges occurring in it.

1.8.2. Development.

Louw (1991:4-5) views development as all changes a structure undergoes during its period of existence, which are relatively or becoming permanent in nature. According to Usang (1992:49), development is expressed in the forms of economic growth, political modernization, cultural transition and social change. Development has altered almost all facets of human life, and left its adverse impact to be remedied. The World Conservation Strategy in Usang (1992:50) defines development as the modification of the biosphere and the application of the human, financial, living as well as non-living resources to satisfy human needs and improve life's quality.

According to the White Paper On Environmental Management Policy For South Africa (DEAT, 1997:8), development is defined as a process of improving human well being through a reallocation of resources involving some modification of structure. Development by Kavanang (2002:318) is seen as an event, which constitutes a new stage in a changing situation. In this case you are changing from being environmentally unaware to being environmentally aware.

For our purpose, development shall refer to improvement or change occurring in learners, which becomes permanent and modifies their attitudes and perceptions of the environment towards environmentally acceptable actions.

1.8.3. Environment.

Usang (1992:46) defines environment as a composite of the Earth consisting of the land mass (lithosphere) bodies of water (hydrosphere) gases (atmosphere) surrounding it, including both living and non-living things found on and in it.

According to Irwin (1993:137) environment is defined as the sum total of all external conditions, which may influence any organism with humans included. It is made up of physical, biological and socio-political surroundings. It is further defined by Arms (1996:3) as anything that surrounds us, things produced both by people and the natural world and it provides our most important resources. It is also defined by DEAT (1996:9), as embracing conditions and influences under which anything exists, lives or develops. Ignacimuthu (1998:290), defines it as the sum total of all conditions and influences affecting development and life of organisms and is always interwoven in the day-to-day life of human beings. The environment is defined by Chacko (2002:20) as the sum total of surrounding things, conditions and all influences (i.e. natural, cultural and political) affecting the life and development of an organism. According to Kavanang (2002:386) environment is the total surrounding conditions affecting people and other living things including natural systems and natural constraints as well as cultural, social, historical, economic, aesthetic and political components.

For this research environment refers to all conditions and influences affecting human beings' development, which is interwoven to human being's day-to-day life to which human beings have a great role in preserving and improving for the sake of a better future.

1.8.4. Environmental awareness.

According to Opie, (1990:43) environmental awareness refers to a development of a conservation ethic enabling humans to both live in harmony with his environment and be able to take stock of his environment with an aim of appreciating and conserving it. As awareness according to Engleson & Yockers (1994:15) refers to becoming aware of an object or phenomenon, or an event in the environment, environmental awareness will mean becoming aware of the existence of an environment together with its components and problems.

Environmental awareness refers to becoming conscious of the existence of the environment together with its problems, which need to be solved (Allers, 1997:19). Environmental awareness refers to a process of developing humans whose decisions and actions regarding the environment favour a sustainable habitat for all humanity (Krause in Maila, 2001:1).

For the purpose of this research, environmental awareness is defined as becoming aware of the existence of the environment and its problems with the need to appreciate and conserve it.

1.8.5. Environmental Education Centre (EEC).

Environmental education centers are off- school centers, which mould and also contribute towards the dissemination of environmental education in schools and general community (Macrae, 1990:107). EECs according to Wilson and Martin, (1991:4-5) are places to which people turn to in order to find information and guidance about a broad range of environmental concerns. Information, which is found there, is organized, evaluated, synthesized and disseminated about local, regional, national and international environmental issues. They are also regarded as vehicles of the broad concept of environmental education. Burge (2003:35) sees them as legal agencies furthering the goal of helping in executing the department's responsibility, which significantly affect the environment.

For this research EECs are centers specializing with disseminating EE, aiming at moulding children's characters such that they think and act environmentally responsibly.

1.8.6. Environmental Education (EE).

Environmental education has been widely defined, in this study only a few definitions are dealt with.

Brennan (1970:2), defines EE as education developing in humans recognition of his interdependence with all life and his responsibility to maintain the environment fit for life and living. IUCN (1971), Nightingale (1977), Stapp and Cox,(1979), Hurry, (1982) and Hopper, (1988) in Macrae, (1990:43), view it as education

recognizing values and clarifying concepts leading towards the development of knowledge, skills and attitudes leading towards understanding the interrelatedness between man, his environment and working in order to better such interrelatedness

Bogan (1973:1), views it as a process fostering greater understanding of communities' environmental problems together with the process of environmental problem-solving and decision-making accomplished through teaching ecological relationships and principles. Van Matre (1990:10) defines it as education in, about or for the environment. Australian Association for Environmental Education in Macrae (1990:43) views it as an approach which could be used by individuals and groups in order to understand better the inter-relationships between humans and environments. Gough in Link, (1993:vi) views it as a field of professional practice addressing changes in personal values and social structures necessary for supporting ecologically sustainable and social just ways for organizing people-nature and people-environment relationships.

Irwin (1993:21) sees it as a sophisticated and holistic concept embracing ecological knowledge and understanding aiming primarily at educating about human interaction with the environment. It is seen as education moving people from a state of oligarchy to a participatory democracy where people cherish their environment as theirs from which they have to take part in creating and conserving (Irwin, 1993:22). Allers (1997:4) views it as a process seeking to develop necessary awareness, ethics, values, knowledge, skills and commitment allowing people to become environmentally literate so that they become pro-active in securing a properly functioning and healthy environment which is sustainable.

According to Chacko (2000:20), EE is defined as education for the environment, sustainable development and development of informed and skilled citizens willing to take action in resolving environmental issues. Harvey & Harris in Queiros

(2001:67) define it as action equipping the learner with knowledge together with environmental attitudes and values reflecting awareness of the surrounding environment and acceptance of responsibility for actions resulting in the resolution of environmental issues and problems.

The working definition of EE will be education aiming at developing awareness in humans through gaining knowledge and understanding about the total environment and its problems, understanding their inter-dependence in the environment for all their activities and develop willingness to become pro-active in securing a properly functioning and healthy environment which is sustainable.

1.9. Programme of the study.

Literature will be reviewed in chapter two. Chapter three is concerned with empirical research that is data gathering process. Chapter four will provide an analysis of data, summary of findings, testing the hypothesis, conclusions and recommendations.

CHAPTER 2

EEC AND THEIR ROLES IN CREATING ENVIRONMENTAL AWARENESS

2.1. Introduction

This chapter focuses on the review of literature regarding Environmental Education Centres (EECs) and their roles in creating environmental awareness. In elaborating on this chapter, suitability of environmental education centres, as agents of creating environmental awareness will be discussed. That will be followed by strategies used by other EECs in creating environmental awareness. The chapter will be concluded by discussing the roles of environmental education centres.

2.2. Suitability of Environmental Education Centres as agents of creating environmental awareness.

EECs are established by The Environmental Management Act as organs of the state (Burge, 2003:62-64). As organs of state they are tasked with a duty of operating as educational institutions promoting environmental education. That is realised through offering programmes, which yield environmental knowledge, attitudes, skills and behaviours which are not harmful to the health or well being of people.

Environmental education could only be promoted only to people because according to Kastenholz and Erdman (1994:17) people are dominated by a desire to know more such that knowledge will lead them towards adjusting actively in their living conditions from time to time. The gaining of such knowledge together with its application shows awareness.

EECs like Letaba EEC and Goldfields EEC are chosen because of them being well positioned, equipped and situated at the heart of nature (Transvaal Educational News, 1993:21). They are said to be well positioned and equipped because most of the EECs although not all are either found inside parks and zoos or have a working relationship with such institutions. Because of their link with nature reserves they have plenty of facilities affording young people opportunities to experience life positively and contribute to environmental issues in their vicinity.

According to Jacobson, Arana & McDuff, (1997:28) EECs are suitable organs of bringing about environmental awareness because they offer great potential for generating motivation, interest, and attention required for effective learning about the environment. EECs are chosen because they could create awareness in a three-folded manner i.e. awareness which yield knowledge development, awareness resulting in value and attitude formation and awareness which develop environmental skills aiming at action taking and abating environmental problems (Bornman, 1997:60)

According to Maila, (2001:17) EECs are chosen as better organs of creating environmental awareness because they are well-equipped to involve both teachers and learners in active environmental learning. As a result of them being well equipped they empower both teachers, learners and communities to face challenges of action-taking in and for the environment in their communities.

Because of the above-stated reasons EECs are viewed as being suitable institutions for awareness creation in their neighbouring schools.

Here-under follows ways through which EECs could create awareness at different levels through activities, which they do and indulge people in.

2.2.1. Awareness aiming at knowledge development.

People have an ability to change their environment either for good or for worse. Change comes when knowledge is gained and put into practice, which becomes visible as change. EECs need to foster change in pupils, which will benefit the environment. EECs aim at achieving that (bringing about change) through putting pupils at the centre, conscientizing them about all the aspects of the environment surrounding them and showing them that they have power and authority to transform, manipulate, control, preserve and destroy them (Brennan, 1970:2).

EECs according to Riley, (1985:56) should be an agent of social change and sustainable development. This is realized through offering environmental knowledge to pupils which shows them how limited their resources are, and hence the need to use them sparingly (Opie, 1990:45) for the sake of maintaining biodiversity and counter extinction (Wass, 1990:71).

In order to succeed in the mission of showing the limitedness of resources, EECs should offer knowledge which enable pupils to take stock of the finite resources from time to time through teaching them the strategies and skills for conducting environmental audits (Opie, 1990:43). EECs need to offer knowledge to pupils, which, depicts them as part of the ecosystem on which they depend for survival (Van Matre, 1990:3). In order for the ecosystem and them to continue living, they

need to treat the environment with sensitivity, improve and maintain its quality, care and preserve the environment as it sustains their lives (Macrae, 1990:41).

Such knowledge of the limitedness of the resources will help in eradicating misconceptions, convictions or half-truths about the availability of the resources, which lead towards greediness (Opie & Schuil, 1993:16). According to Irwin,(1993:105) such gained knowledge should help pupils to move with times and become more relevant to prevailing and anticipated social and economic needs and changes. This will be realized through responding to audit recommendations by adopting life-styles and developmental paths, which not only respect but also work within natural limits. EECs were chosen according to Allers, (1997:3) because they seek harmony between people and nature, sharing with each other and caring for nature.

EECs should let pupils know that the caring of the environment is their responsibility and encourage them to either do it as individuals or in groups (Ignacimuthu, 1998:299).

What knowledge EECs should transfer according to DEAT, (2000:2) is that which conscientize pupils about their behaviours, instill a sense of responsibility, turn prejudices and wrong perceptions around and show them prospective employment which could be created through environmental projects.

EECs, depicts the environment as a barometer of a nation’s health through demonstrating the relationship between human rights, a healthy environment, and inclusivity. Caring for the environment therefore guarantees a healthy nation (Burge, 2003:49, City Press, 2004:8)

Gained environmental knowledge, make a strong base for the formation of environmental morals, values and attitudes.

2.2.2. Awareness resulting in moral, value and attitude formation

At this level EECs develop awareness which yield development of morals, value judgement, lifestyles adoption and attitude formation which are environmentally acceptable (Shongwe, 1996:98).

EECs help pupils in making choices about their lives and give value to such choices through accepting responsibility for their choices (Riley, 1985:81). Such choices should be based on the presumption that the earth is not disposable with natural resources not endless and having a concern about the deteriorating quality of the environment in which they live (Riley, 1985:81). In order to help in fostering such choices, EECs should help in the formation of a land ethic illustrating man's temporary stewardship for the environment (Macrae, 1990:11).

EECs should develop considerate and careful attitudes in pupils through developing a condition of productive harmony between pupils and the environment. This could be realized through minimizing destructive changes while healthy change, are encouraged (Opie, 1990:43, Irwin, 1993:28).

Through adopting and following ecologically sustainable attitudes, EECs aim at generating and sustaining social values. Such values are generated through letting pupils move from an oligarchy life-styles to a participatory democracy life-style in which pupils cherish their environment as theirs and take part in creating and conserving it (Irwin, 1993:22).

Such participatory democratic lifestyles will discourage in pupils actions leading towards the disappearance of resources but letting them continue to exist. This, according to Ignacimuthu (1998:291), could be realized through developing an interest in pupils for their environment, becoming considerate of wildlife, their life-styles and habitats. Through helping wildlife and the environment, they themselves (pupils) develop personal growth on caring ands protecting themselves and their properties (Ignacimuthu, 1998:291).

According to DEAT, (1999:3) sustainable social values which EECs should inculcate in pupils, should yield a culture of responsibility in relation to waste and pollution management to such an extent that pupils will start their own projects of abating waste and pollution problems.

EECs help pupils with moral awareness formation as well as development of a commitment to act on one's values and feelings (Maila, 2001:14-16). That is achieved through providing opportunities to pupils to participate actively in environmental improvement and develop attitudes of responsible members of the biosphere who take part in improving the environment (Rampedi, 2001:44).

According to City Press, (2004:8) EECs should concentrate on changing the perception of things so that pupils should stop threatening their life-supporting system. That could be realized through EECs inculcating an attitude of reverence to life by showing them the inter-dependence of all living things one on the other.

Emanating from morals, values and attitudes formed at this stage will follow the taking of action with an aim of continuing with environmentally acceptable behaviours whereas environmentally unacceptable behaviours are corrected.

2.2.3. Environmental awareness resulting in skills development and action.

Environmental knowledge, values and attitudes alone cannot benefit or bring about change in the environment we live in. Environmental knowledge, attitudes and values benefit the environment when they culminate in the carrying out of environmentally acceptable actions. It is part of EECs' responsibilities to bring it to the senses of the pupils that their environment could not be converted or changed by what they wish but by what they are and will do. As a result of the above statement EECs should make pupils aware of their actions, behaviours and their consequences thereof (Brennan, 1970:5).

Van Matre's view (1990:26) is that awareness at this level through EECs could be achieved through showing pupils how life works, what does that mean to him/her and how can he/she change his/her life-style in order to live more lightly on the earth through effecting less pressure on the environment and its resources. That is realized through EECs offering pupils opportunities to exercise their skills in situations where real problems are solved. Their roles in such a situation should not be undermined to that of an observer but, should lend a hand in the planning and administration of such projects (Wass, 1990:1)

EECs should show nowadays' parents and decision makers that a fundamental right to a healthy and life enhancing environment is guaranteed to our children if we all take part in showing the urgency of action taking than the gaining of knowledge (Opie, 1992:4).

EECs according to Irwin, (1993:27) should create an attitude and values in pupils of being stewards of the environment always ready to care for it. Caring for such environments should be done through practising action-taking skills, which could

either be done individually or in cooperation with others in order to improve the quality and sustainability of the natural resources (Gough in Link, 1993:vi)
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EECs have a role of concsientizing pupils that it is not the perception of an environmental issue as being either important or less important which matters, as that does not diminish its potential effect if nothing is done about it. What matters and should be emphasized by EECs according to Irwin, (1993:6,28) is the action we take about the issue rather than wasting time in grading such an issue as being important or unimportant.

According to Shongwe, (1996:98) EECs should provide opportunities from the outdoors to create awareness and learning with an aim of developing skills which introduce pupils to investigation methods. EECs should capacitate pupils to participate effectively in managing the environment and achieving sustainability (DEAT, 1996:26). One way of achieving that is through EECs helping schools in the creation and popularization of schools environmental policies.

EECs should show pupils behaviours and actions, which are environmentally better than what they are doing and encourage them to change for the better (DEAT, 1997:23). An example of that is when EECs emphasize the protection of natural environments whereas constructed ones are altered with an aim of improving them such that they become environmentally friendly (DEAT, 1997:23).

EECs, (Ignacimuthu, 1998:298), should develop respondents who apply the slogans “think globally and act locally” together with “charity begins at home”. Their response to such slogans shall be shown through applying their environmental skills in their surroundings before doing it anywhere else.

It is within EECs' roles to develop accountability in pupils towards the environment (DEAT, 2000:6). That is achieved through letting pupils acquire skills needed in identifying, investigating and contributing to the resolution of environmental issues and problems, and the participation in thoughtful, positive action regarding the environment (DEAT, 2000:6, Chacko, 2000:32).

EECS should make environmental legislations known to pupils and put pressure on those passing legislation to amend legislation passed before having a negative bearing on the environment. According to Unesco as stated in Maila, (2001:16), through the above-mentioned process class groups and individuals shall have an opportunity to be actively involved at all levels of, working towards the resolution of environmental problems through environmentally acceptable mechanisms.

EECs should help pupils in helping the earth in healing her wounds as that also helps pupils to heal theirs. That is made possible through reacting in time through taking actions like respecting, caring and conserving resources like land, water and air before there is a crisis (City Press, 2004:8).

EECs should help pupils in practising sweeping changes which restore a world of beauty and wonder through overcoming changes ranging from Aids to climate instability (City Press, 2004:8)

In creating awareness to pupils from their neighbouring schools EECs should use strategies for creating environmental awareness as practiced in other EECs.

2.3. Strategies for developing environmental awareness.

According to Guralnik (1971:734) a strategy is a science of planning and directing large-scale military operations. In this study it is a science of planning and directing the creation of environmental awareness. Several plans and directions of making people aware are available and the following were considered relevant and available for our research.

In elaborating on this section, the following aspects will be treated as strategies for creating environmental awareness: programmes and projects, collaboration between EECs and other structures, tales and songs, EECs and schools visitation, formation of environmental clubs, environmental films, workshops and seminars, use of mass media, development of resource materials, affiliation to environmental bodies, provision of incentives, environmental celebrations, displays, competitions and environmental games.

The above-mentioned strategies will be discussed individually with emphasis on what EECs from other places did in order to create environmental awareness to schools and communities surrounding them.

2.3.1. Environmental projects and programmes.

A project is defined by Guralnik (1971:594) as a proposal, scheme or an undertaking which ends up binding the one who takes such an undertaking to carry it out. Environmentally, such undertakings involve caring for and protecting the environment. Programmes on the other hand are defined as the events or pieces

collectively by Guralnik (1971:594), which in our sense shall refer to all events, which could be undertaken in order to create awareness amongst people.

In order to arouse environmental awareness and education, projects need to be initiated to meet the needs of primary, secondary and tertiary education (DEAT, 1996:35). The basic idea is to inculcate in the youth the spirit of learning by doing, of leadership, work ethic and sense of pride. Through taking part in projects students will both be gaining knowledge on what is environmentally acceptable, unacceptable and taking part in healing, improving and caring for our mother earth. Programmes and projects used by other EECs include the following:

1225 Nature and Environmental Education Centres' programmes were studied by Simmons, (1991:18). They reflected a programme in nature study aiming at instilling appreciation or encouraging preservation through preserving and enhancing environmental quality through nature study as being a common programme in all the centres. Such a programme views that through re-establishing the bond between man and the natural world, we can thereby establish a concern for conservation.

National parks in the USA like Pennsylvania State Park system introduced school programmes that augment regular curricular whereas The Grand Teton National Park introduced the Teton science school programmes. The programmes help in fostering more favourable attitudes towards conservation, promoting sustainable natural resource management and increase a park systems' flow of benefits to the public through serving as an educational resource (Jacobson & Padua, 1992:290)

School programs for Kinabalu Park in Malaysian Borneo aimed at providing education for people such that they appreciate and enjoy what the park stands for

and offers (Jacobson & Padua, 1992:291). Such programmes were in the form of exhibits, guided walks and slide shows (Jacobson & Padua, 1992:291).

The educational programmes at Morro do Diabo Park aimed at inviting local school's teachers by researchers to the park in order to determine their own needs. Such invitations culminate in a programme designed aiming at making students more aware of their environment, be able to make better informed environmental decisions and learning much about the wise use of natural resources (Jacobson & Padua, 1992:291).

New Jersey Audubon Society-Scherman Hoffman Sanctuary is offering the following programmes in order to develop awareness to students in a special education:

- programmes for studying trees i.e. their types, bark types as well as their rubbings and printing their leaves as a way of showing several roles which trees could perform.
- programmes for studying insects and the symbiotical relationships occurring between such insects with the trees, grass and salt mash from which they live using hand lens.
- conducting both water quantity and quality audits and testing in order to highlight the amount of water we waste each day and how clean is the water that we drink.

Park programmes were also used in Kenya as Wildlife Clubs provide opportunities to secondary schools' students participating in ecology activities at national parks around Kenya. Such programmes promote extracurricular environmental activities at their schools (Jacobson & Padua, 1992:290)

Pilanesberg Game Reserve and Goldfields Environmental Education Centre's programmes aim at developing harmony between humankind and the environment. This is attained through teaching pupils to live within the constraints, which the environment imposes, and utilizing the opportunities which it provides (Irwin, 1993:23). This is achieved through taking part in programmes like:

- basic ecology, population dynamics and orientation to the Pilanesberg Game Reserve coupled with game drives.
- workshops, seminars and courses for treating topics like environmental education theory and philosophy.
- bird identification and competent use of field guides.
- courses on practical field ecology aiming at getting out, seeing, doing and enjoying which are treated for both teachers and pupils
- The Intensive Education Zone (IEZ) initiated with an aim of providing outdoor teaching facilities and experiences adjacent to the Goldfields Environmental Centre. In such a zone teaching of all basic ecological principles and its application by hands on learning experiences within a relatively small area, which is within easy walking distance for pupils and teachers takes place. It is also developing environmental skill through letting visitors walk in through, an aviary stocked with indigenous hand-reared birds, which they could hold, and study at a close distance.
- soil erosion simulations, a snake pit, waterfowl ponds an iron-age site where artefacts are produced and an opportunity to handle animals is provided.
-food gardens programmes, which introduce simple and ecologically sound Methods of cultivating food gardens to communities and schools (Irwin, 1993:23, 109, 122). Other programmes, which were offered by New Jersey Audubon Society-Sherman Hoffman Sanctuary according to Santiago, (1999:27) included

studying about animals and their relations to human beings, their benefits to humans and coping strategies.

Programmes addressing the educational needs of pupils in environmental protection built on the values of, respect, care for and interacting with creation are initiated from the Centre for Indigenous Environmental Resources (CIER) in Canada (Wastasecoot, 2001:15). Such programmes engage learners with the teachings, builds on what they have experienced within their cultural contexts while providing opportunities for reflection and application of new knowledge (Wastasecoot, 2001:17). Hands on and collaborative learning projects, were introduced in CIER. They are aiming at providing creative opportunities for conveying indigenous and western knowledge through actively including and respecting the knowledge of the people while at the same time addressing the realities of environmental changes and challenges (Watasecoot, 2001:18) Durban, Dundee and Eshowe Environmental Education Centres aim at yielding and developing awareness through programmes, which provide genuine curriculum enhancement for learners, students and educators and solutions to environmental problems. This is done with an aim of addressing environmental concerns in a practical and contextually meaningful manner (Burge, 2003:56). They arrange their daily and quarterly programmes so that centres' facilities are utilized by educators and educator groups with an aim of cascading environmental education to as many as possible. In order to create awareness in rural areas, centres developed a programme of going into rural schools with teachers and run programmes with them as a basis of getting into the communities, forming clusters and working through teachers i.e. servicing teachers through their centres.

Dundee EEC created awareness through helping schools in performing elementary environmental audits and give them hints about how they can improve their situation. Other programmes like Pietermaritzburg's EASY (Environmental

Award System For Youth) facilitated much awareness for perpetual guidance occurred as experts (environmental educationists) worked alongside educators and learners using what they knew and understood better maintaining enthusiasm amongst schools.

Thohoyandou Community Environmental Education Centre offers youth leadership programmes aiming at teaching and training youths in and out of schools in starting and managing environmental projects (Dept. Fin & Env. Aff, 2004:6).

Delta EEC started an environmental education programme on owls in order to counter negative sentiments towards owls. The programme concentrated on erecting breeding places for them, eradicating fear, ignorance or misunderstandings about owls through highlighting the benefits we get from owls like reduction of rodents population which trouble our crops (http://www.deltaenviro.org.za/geoff/ date of access, 2005/07/06).

The St Lucia Education Centre offers several programmes to schools, which visit them like energy flow, adaptations, relationships, and cultural programmes. Other programmes could be those which visiting groups could bring up in the form of their themes. All the above-mentioned programmes are treated with an aim of making pupils visiting the centre aware of the importance of protecting and caring for our environment (http://www.kznwildlife.com/stlucia_ed.htm, date of access, 2005/07/06).

From My Acre of Africa Environmental Education Facility programmes like setting of aquariums focusing at revealing biodiversity of the rivers in the park are carried out. This is done in order to give visitors who could not get practical opportunities to experience the wonders of the park's waterways an opportunity to

have a glance of that reality (http:// www.myacreofafrica.org date of access, 2005/06/06).
Other programmes are designed around learner needs, which could take the form of classroom-based instruction, field research activities, social, cultural and environmental research. Eco school project, Kids in Kruger programmes and Take Kruger to Kasie programme are other programmes run by Letaba EEC. Here primary scholars are required to paint the colours of animals drawn as seen from the park. General and other special interest courses in birds, trees, plants and animals are also in place.

Day programmes designed to introduce children to the richness and diversity of the earth and fostering an understanding of ecological processes are offered by Springfield Environmental Centre. Such programmes could take the form of explorations, observations, first hand discovery and the development of concepts and attitudes concerning the natural environment *(*http://www.springfield.bham**.** org.uk/experience.html, date of access, 2005/07/06***).***

2.3.2. Collaborations between different bodies and structures.

Collaboration is defined by Guranlik, (1971:147) as an act of working together of different parties. In our situation it will be working together between EECs and other stakeholders with an interest in EE.

As part of the Tbilisi conference's suggestion that environmental education should be aimed at every level of the population, including non-specialists professionals whose activities may have a significant impact on the social aspect of the environment as well as scientists and technicians (Unesco in Loubser and Ferreira, 1992: 32) it becomes necessary that there be collaboration between departments and institutions in order for awareness to be created and maintained. That could

take the form of raising awareness in all departmental meetings of all levels i.e. managerial, juniors and labourers. As the training of occupational and social groups, professionals and scientists was neglected (Loubser and Ferreira 1992:32), more emphasis should be given to them as a way of collaborating between different departments. More collaboration will also be required between environmental centres and radio and television programmers as well as newspapers and magazines editors in order to feature environmental issues in their programmes and journals as often as possible.

Educational researchers from Kinabalu Park in Malaysian Borneo invited teachers from local schools to the park and interviewed them in order to determine their environmental need and such needs were met through joint effort between researchers and local teachers (Jacobson & Padua, 1992:291). Collaboration from Morro do Diablo Park in Brazil was in the form of researchers training park employees and local high school students on awareness matters such that they become nature guides assisting with school programmes. In consultation with local schools' headmasters and teachers, researchers from Kinabalu Park developed booklets, teachers' guides and follow-up worksheets to be used during and before outing for primary grades.

Pilanesberg Game Reserve and Goldfields Environmental Centre had close working relationship with the Primary Education Upgrading Programme (PEUP). That led to environmental educationists producing teaching and learning material, which are of environmental nature for the programme (Irwin, 1993:80). Environmental educationists from the above-mentioned centre developed relationship with educationists from University of Bophuthatswana (Unibo) and The Ministry of Education of Bophuthatswana with an aim of creating awareness from the two institutions. The centre also made a submission to the Bophuthatswana Teacher Education Board with an aim of incorporating EE as a

discrete subject in the colleges of education with an aim of making all teachers to be environmentally aware so that they are going to create further awareness to their pupils.

In order to foster relationship between Goldfields EEC, Unibo and The Ministry of Education (Bop) an environmental education committee was initiated with representations from the three stake holders regulating and facilitating inclusion of EE in schools and at Unibo (Irwin, 1993:90). Further collaboration was between the centre and Bophuthatswana Postal Services where environmentally orientated postage stamps depicting environmental education were produced and sold (Irwin, 1993: 94). The secondment of teachers from the Bophuthatswana's Ministry of Education to Goldfields EEC, who will run environmental education programmes and liaise between the centre and the schools created much awareness in schools both visiting the park and those visited by the educators. The EEC had good working relationships with Bophuthatswana Defence Force (BDF) where the Bophuthatswana Defence Force supplied the centre with equipments for camping like tents for pupils to go camping within Pilanesberg Game Reserve.

Good working relationship between a centre and the neighbouring community was experienced in Canada's Centre for Indigenous Environmental Resources where environmentalists and elders from the community designed a programme for educating their youth. The aim of the programme was to develop environmental values of respect and care for interacting with creation (Wastasecoot, 2001:15). From the above-mentioned institution they introduced indigenous instructors on each team who is an elder who shares knowledge of traditional ways for protecting the environment as of importance to the success of the students and the team. Such collaboration aims at showing that Western and Indigenous knowledge can work together in protecting the environment.

My Acre of Africa EEF collaborated with neighbouring schools and communities in the form of offering them opportunities to become tour guides and for cultural performances together with lessons on mixed land use, sustainable farming and conservation (http:// www.myacreofafrica.org**,** date of access, 2005/06/06).

Celebration of special environmental days like World Tourism Day where park cleaning and tree planting is being done is always done with participation and help of Kenya's NGOs as facilitated by Nakuru Education Centre. Another collaboration at this centre is between the centre and a bus company, which makes a sixty-two-seater bus and a twenty-four-seater minibus available for hire to Lake Nakuru in order to offer better opportunities for students to learn more about the lake and become more aware (http://www.kws.org/nakuru.edu.html, date of access, 2005/07/07).

2.3.3 Environmental tales and songs.

Story telling has been an old age tradition around the fireplace, which can never be wished away as such (Riley, 1985:35). As learning becomes meaningful when new things are linked with already (previously) known things, linking environmental awareness development with tales and songs around the fire will guarantee the success of awareness development (Stuart, Van Niekerk, McDonald & De Klerk 1989:76).

Around the fire could be a good site for singing, chanting and doing rhythmic activities and telling stories together with readings about the environment (Riley, 1985:35). According to Irwin (1993:74), moral tales and songs are necessary for developing awareness, as they are ways of developing social attitudes and moral

responsibility. Environmental stories to be told around the fire should always be about imaginary animal characters such as the astute hare, the imperious lion and the mischievous baboon depicting what better things they can do (Irwin, 1993:75).

According to Allers, (1997:44) songs could also be composed about the character of animals like the might of lions and elephants, the cunning jackal etc. Songs could also capitalize on letting people discover that they share many characteristics with their fellow creatures, which gradually leads towards the development of a concern for things outside themselves (Allers, 1997:44).

Drama, puppets and music are referred to by Shongwe, (1996:109) as creative methods catering for individual differences between children providing varieties in learning and enhance the learning process.

Canada's CIER training in environmental protection and solving of environmental problems begins with the transfer of the traditions, customs and values that have engaged generations of their ancestors so intimately with the land from the elders (Wastacoot, 2001:16).

As echoed by chapter 36 of Agenda 21, which requires government to affirm the right of indigenous people to use their experience and understanding of sustainable development in playing a part in their education and training, visitors to Letaba EEC are told area-orientated stories. The aim of telling such stories is to lead them towards seeing the need to act in environmentally acceptable ways. Such stories and songs are told and taught by retired rangers where they create awareness through discouraging poaching (Kristy, date interviewed, 22/03/2005).

An open-air amphitheatre provides a venue for live theoretical and cultural events as well as nighttime “Bushveld Tales” presentations and school tour events from My Acre of Africa EEF (Patience, date interviewed, 22/03/2005).

Tsavo East Education Centre dramatizes conservation activities for visitors in order to increase their environmental awareness. Such dramatization could take the form of plays, folklore or role plays (http://www.kws.org/tsavoeast-edu.html, date of access, 2005/07/07).

2.3.4 Nature centres’ visitation and school visits

Nature centres’ visitation is still the only form of bringing people into contact with nature and wildlife as that leads towards increased awareness towards aspects of nature (Maila 2001:13). It could either be a day visit or an accommodated visit sometimes referred to as camping. Visitations are necessary in order to generate environmentally desirable behaviour upon which the future survival of our country depends apart from information (Opie, 1992:5). Such visitations could be organized in the form of “summer schools” which could reach larger and larger numbers of young people (Opie, 1992:5).

Camps or visits to nature centres help in promoting sound rural development involving youth for they have an advantage of knowing the local situations (Ignacimuthu, 1998:306). During camping several programmes could be undertaken in order to create awareness to pupils like guided nature walks, public talks, outreach talks, overnight programmes and after school programmes (Jacobson et al, 1997:35).

School visits by environmental educationists is of importance in that school visits talks, EE materials supply and clarification, trips and environmentally related assistance like in project initiation and helping with programmes and running workshops for pupils and educators could be organized during such a visit (Jacobson et al, 1997:34).

From The Directory of Nature and Environmental Educational Centres they encourage and take part in visitation because they see it as the only way of re-establishing the bond between man and the natural world and thereby establish a concern for conservation as we cannot build a relationship with nature without having contact with the natural world (Simmons, 1991:18).
National parks in the USA according to Jacobson & Padua, (1992:290) emphasized visits to parks for it provides novel, thought-provoking experiences stimulating students' curiosity and interest, which in turn facilitates information processing.

In Malaysia's Taman Negara National Park week-long natural history visitation programmes are carried out from which environmentalists have to visit schools which visited the park as a post-visit activity where they increase exposure of pupils to concepts introduced during their visit (Jacobson & Padua, 1992:290). From Kinabalu Park in order to transfer what they learnt at the park to their places of residence, visiting school groups are given a follow-up activity worksheet for completion in their schools and homes with an intention of reinforcing what the students learnt at the park, encouraging them to explore the natural world and share information with their families (Jacobson & Padua, 1992:290).

In Goldfields EEC camping is offered with an aim of giving pupils opportunities to enjoy the outdoors, which they were denied under apartheid and as a results learning the do's and don'ts of the environment (Irwin, 1993:80). School visits by

environmentalists was for aiding schools in formulating their environmental education policy and helping them in how best would they implement them (Irwin, 1993:91). The centre like the other ones took an undertaking to create awareness through visitation by school groups and as a result created all possible opportunities to have many children visiting the park and the centre offering environmental information to visiting groups. Environmentalists also visited PEUP clusters in order to help them with the incorporation of the environment in all their lessons.

Both Durban, Dundee and Eshowe EEC have few schools utilizing their facilities on a day visit basis but more using their sleeping facilities such that the boarding fees keep them going without closure as that is their only source of income (Burge, 2003:33-34). Two or three environmental educational programmes are treated for day visitors whereas more are treated for accommodated visitors including those involving practicals. From such centres, accommodated visitors have programmes which create awareness of the relationship between human rights, a healthy environment, social justice and promote, demonstrate and model environmental inclusivity (Burge, 2003:34).

Also environmental educationists from the centre visits schools in order to monitor progress in environmental behaviours and awaken teachers and learners about environmental activities to be undertaken e.g. special environmental days' celebrations or helping with their school's environmental projects (Burge, 2003:72). In order to attract more visitors the centres have kept their costs as low as possible such that all people will afford to visit and as a results become aware of environmental issues.

From Letaba EEC visit to the centre could take the form of a day visit or an accommodated visit in a Bushveld camp. Free entrance to a maximum of four

buses per day carrying a maximum of fifty passengers each is given to school groups provided that they shall have to spend one hour in the EE centre. During that hour they will be educated in any environmental topic of their choice with an aim of creating environmental awareness. Because accommodated visitors have more time than day visitors more programmes are treated with such visitors like: environmental tales, songs and ecological activities (Kristy, date interviewed, 22/03/2005). According to Patience, (date interviewed, 22/03/2005) an environmental educationist from the centre visits schools and run some environmental educational programmes from their schools.

From My Acre of Africa EEF, visitation for both accommodated and day visits are available with awareness planned to be developed during both day- and night-guided walks through investigating aspects of nature and themselves (i.e. exploring an ecology, explore and note animal and plant behaviour, see the effect of human interventions etc). During such visits they are also taught the importance of their natural heritage which will be treated at the School Tour Centre. In order to bring pupils closer to nature pupils shall make use of the Rhino Boma Facility where rhinoceros are kept in holding facilities for visitors to view and observe them from a close range. Accommodation is available to accommodate at least 100 students at a time (http://www.myacreofafrica.org, date of access, 2005/06/06).

Zoo Education Centres (Taronga and Western Plains Zoos) offer students accommodated visits to their zoos. This enables the pupils to see the zoo at night, sleep in the zoos classrooms, meet live animals up close, go behind the scenes and assist the zoos in saving endangered species. For those who are unable to visit the zoo because of financial, cultural health or distance reasons an outreach programme called “The Zoo mobile” is in place. Zoo mobile officers take live

animals to schools in order to complement classroom activities across all key learning areas http://www.curriculumsupport.nsw.edu.au/enviroed/index.cfm?u=4&;=43,date of access, 2005/07/07).

Nakuru Education Centre organized weekend and public holiday community education bus tours to the park where two guided tours are conducted for schools groups which have booked for it where lectures and discussions are carried out (http://www.kws.org/nakuru-edu.html, date of access, 2005/07/07).

From Nairobi Education Centre outreach programmes to schools and other training institutions on environmental and wildlife conservation issues are carried out. The aim of the programme is to help and introduce an environmental perspective to what has been learnt (http://www,kws.org/nbi-edu,html, date of access, 2005/07/07).

2.3.5. Formation of environmental clubs.

Previously environmental clubs didn't enjoy any recognition but as of now environmental groups are beginning to receive attention as they play a role in establishing environmental standards. As children love to belong to clubs and societies (Opie & Schuil, 1993:24) they could be vehicles, which could be, manipulated in ferrying awareness campaigns. By making club members environmentally aware and slotting in awareness activities/messages in their programmes we could treat the environment better, for each member will in turn create further awareness to their families and friends who are not part of the club/society. EECs' role in this strategy as stated by Wangari Maathai in City

Press (2004:8) is to encourage and initiate grassroots environmental movements, which help in raising awareness and solve environmental problems.

In order to increase awareness EECs should establish school EE clubs and community EE clubs as a way of enhancing environmental awareness.

After studying the development of environmental educational clubs in Zambia and Kenya, Goldfields EEC initiated the formation of environmental clubs. They were used as a vehicle of furthering awareness of the economic, cultural and aesthetic value of natural resources with The Lengau Conservation Clubs school-based formed by pupils under the supervision of teachers and adult clubs were the first to be formed by teachers, nurses, policemen and women organizations (Irwin, 1993:81). Clubs were started as a back-up service for schools visiting Pilanesberg Game Reserve but were later started on interest and knowledge about conservation and the environment.

At the beginning the clubs' activities included tree planting, anti-litter campaigns, erosion reclamation and developing school grounds. As they developed they have now become involved in community and social issues, conservation and the promotion of ecological knowledge and in practical issues like development of organizational skills and camping (Irwin, 1993:112)

From Dundee EEC "Eco-Clubs" in schools were formed as a way through which 'experts' (i.e. environmentalists) could work alongside educators and learners where they will both be advised on environmentally acceptable behaviours and model environmentally acceptable behaviours.

From Letaba EEC clubs like Phalaborwa Ecoclubs have been formed which interact with the environmentalists on regular basis. Members help each other in

taking part in conservation and people's involvement in environmental management programmes. They help in strengthening the relationship between the park and surrounding communities by inviting their friends to join programmes offered by the park like "Take Kruger to Kasie Programme" which is an environmental awareness programme spreading the message of conservation and environmental education. They also take part in competitions and projects run by the centre and the park (Patience, date interviewed, 2005/03/22).

2.3.6 Environmental films.

Films have been an integral part of pupils from where they even find role models to emulate because they arrange or organize activities to be observed in a concrete setting (Duminy & Sohnge, 1986:166). By showing them environmental films, which are aiming at inculcating good environmental practices with celebrities modelling good environmental behaviours, more people could be lured into good environmental practices (Duminy & Sohnge, 1986:166).

The use of films in creating awareness is supported by Engleson & Yockers (1994:12) because films compress both time and space, thus omitting unnecessary and unimportant material and allowing for concentration on selected key points. From the above statement it becomes clear that because we are concerned with awareness development we could organize our film such that we only include awareness arousal scenes. Through slow-motion photography complicated actions could be slowed down and seen at their actual speed (Engleson & Yockers, 1994:13).

Indigenous knowledge which could bring a bearing on awareness development could be recorded and used through encouraging pupils to do the shown action as their relatives are doing it as seen from the film could yield better awareness (Burge, 2003:128).

From Morro do Diablo Park and Kinabalu Park film shows precedes nature trails. The films that are shown present values of the parks and conservation which they have to practise during their guided walks (Jacobson & Padua, 1992:292).

In Goldfields EEC, apart from videos, which are shown at the centre for visitors, they also have a mobile film van. The van is self-contained and it carries awareness messages through environmental films during school visits to schools and communities even to where no electricity is available. The film van created first contact between rural pupils and environmental education (Irwin, 1993:81). The EE centre has eight fully equipped vans servicing the whole North West Province and reaching 150 000 pupils totalling 25% of the total school enrolment in North West Province.

Dundee EEC has a well-equipped educational media centre with environmental DVDs and videos. A mobile service centre, which provides for schools and satellite resources centre, is also available. Through the mobile service centre such DVDs and videos could be viewed from schools, which, caters for those pupils who cannot afford to reach the EE centre (Burge, 2003:128).

From Letaba EEC, according to Kristy, (date interviewed, 22/03/2005) all school groups which are given free entrance are shown an environmental film showing how humans are supposed to contribute to ecological management and what they are doing which is contrary to what they have to do. Films develop awareness through showing the mutualistic relationship which different ecosystems depend

on and discourage unacceptable environmental practices like poaching and the cutting of park fences so that livestock could have access to graze in the park.

My Acre of Africa EEF has an Eco-Cinema, which screens full daily schedule of short films accessible to anyone visiting the facility. The cinema also catered for showing films to people attending the facility as part of a structured course where specific films need to be seen for educational purposes (http://www.myacreofafrica.org, date of access, 2005/06/06).

From Taronga Zoo Education Centre an outreach programme "The Zoo mobile" is introduced to schools which cannot visit the zoo because of financial, cultural, health or distance reasons. Instead of showing films of animals they bring along live animals to their neighbouring schools with a Zoo mobile officer who will use them in complementing classroom activities along all learning areas (http://www.curriculumsupport.nsw.edu.au/enviroed/index.cfm>u=4&;=43, date of access, 2005/07/06)

In-house special wildlife lectures and video shows are carried out from Nairobi Education Centre. On weekends such video show are free of charge at the centre's lecture hall (http://www.kws.org/nbi-edu.html, date of access, 2005/07/07).

2.3.7. Workshops and seminars.

Workshops and seminars where environmental information could be shared in order to arouse interest could be conducted at EECs or during visits to schools. As suggested at the Moscow conference (Unesco, 1988:13), pre- and in-service training should be promoted. Through such training environmental ethics and

values should be engraved in teachers' conscience. Such pre- and in- service training and workshops should aim at eliminating or reducing known barriers to EE (Ham & Sewing, 1988:23).

According to Kanyimba (2002:74) awareness will be developed if teachers are invited to conferences, workshops and seminars so that they gain understanding of EE goals and objectives which could be realized through hawking EE goals and the need for their implementation at teachers' conferences and continue to do so until the message is internalized. Workshops and seminars should also allow teachers from different departments to sit together when planning their teaching where they will be encouraged by noticing how others are doing it and challenged to follow suit (Kanyimba, 2002:74).

In Brazil's Morro do Diablo Park, in-service training take the form of an interdisciplinary programme touching on sciences, art and mathematics. The programme was developed for local teachers of all subjects with an aim of letting them infuse EE in their subject teachings (Jacobson & Padua, 1992:291). Workshops in this centre also included the training of park's employees and four local high school students as nature guides who will help with the school programme.

After discovering that teachers lack training in EE matters, EECs in Kuldiga, Lieaja and Daugarpils initiated teacher training based on teaching EE as a cross-curricular subject and develop in teachers active approaches to their every day's teachings (Jacobson & Padua, 1992:291).
From Goldfields EEC workshops were not only organized for teachers but, also for principals and inspectors in order to yield better infusion of EE into existing curriculum and support teachers and pupils in their environmental efforts (Irwin, 1993:108)

From My Acre of Africa EEF, its multi-purpose learning centre offers in-service teacher education courses in environmental education. Such courses aim at supporting the objective of environmental education and empowerment (DEAT, 1997:35) i.e. that of incorporating EE in all programmes, levels, curricula and disciplines of both formal and non-formal education. Another area, which is treated during workshops, is the development of self-confidence in teachers in using outdoor settings as learning fields and correct procedures for managing our school environments.

Dundee, Durban and Eshowe EECs organized workshops for teachers in order to upgrade their methodology and to adapt to the outdoor classroom. That was realized through letting teachers gain environmental knowledge and working skills for life and making teaching an addendum to indoor teaching through offering teachers a menu of activities and things which may work particularly well which fit in well with classroom activities through their excursion learning (Burge, 2003:41). Inset also aimed at empowering educators to be confident and competent in environmental techniques and develop satisfactory method of passing on environmental learning. Workshops for both teachers and principals were organized for the development of and implementation of schools' environmental policies (Burge, 2003:51)

According to Patience (date interviewed, 22/03/2005) from Letaba EEC, workshops for both teachers and learners are conducted with the park inviting specialists on the field to be treated (mostly ecological) to address the delegates. Topics to be treated during such workshops include conservational, ecological and awareness-provoking topics.

Hams Hall Environmental Centre provides consultancy advice on environmental/ecological matters to schools. It also provides teacher in-service training in line with the implementation of EE (http://www.hamshall.bham.org.uk/who_are_we.htm, date of access, 2005/07/06)

2.3.8. Use of mass media.

According to DEAT's (1997:35) supporting objective for EE and empowerment, environmental literacy could be enhanced through the use of mass media, which warrants it to be a strategy. Media for this research will include both printed and non-printed media transferring information from the source to the receiver. Awareness could be raised through making adverts and devoting pages in newspapers and journals about current environmental issues worthy of mentioning. Advertisement could be made in newspapers, magazines and advertisement boards, scoreboards in games' tournaments, television and video boards flashing awareness developing information which will make sportsmen, spectators and passer-by environmentally sensitive (Burge, 2003:54).

According to Kanyimba, (2002:74) EECs should rather start their own community newsletters in which they will write more about environmental issues rather than given slots to report where they end up reporting less issues as requested by the institution.

Letaba EEC uses SANPARK's own journal called "Kiewiet". Environmental issues, research and developments are covered by the communication department where the centre has to let them know about events to be staged and they cover. Environmental videos are shown to visitors mostly produced by "National

Geographic Films" in order to help them further their awareness (Patience, date interviewed, 2005/03/22).

Apart from only organizing talk shows and radio broadcasts on the concept of environmental education Goldfields EEC of Pilanesberg Game Reserve also organized workshops and seminars for radio broadcasters and people working in television so that they be environmentally aware so that whatever they always say should be environmentally acceptable rather than broadcasting environmentally unacceptable messages during slots put in place for environmental upgrading (Irwin, 1993:85, 109).

Like other EECs Durban, Dundee and Eshowe EECs run advertisements and publish articles in local newspapers and magazines in order to publicize their centres. Leaflets and booklets containing environmental information are distributed to schools and communities (Burge, 2003:54).

Environmental educationists from Thohoyandou Community EEC distribute pamphlets to people and schools in order to create awareness (Dept.of Fin & Econ. Dev, 2005:06). Local radio stations like Phalaphala FM and Radio Univen are used in disseminating awareness programmes together with advertisement and slots in the local Mirror newspaper. In order to cater for those who will not be able to be catered by the above-mentioned strategies a banner is put next to the project site (Department of Finance and Economic Development, 2005:6).

2.3.9. Development of EE teaching and learning resource materials.

Environmental awareness could develop quicker if it is merged with teaching and learning as more people view teaching and learning as a footstep towards better career and life style. If EE wants to follow this route (viz: of merging with teaching and learning) it needs to develop EE learning and teaching materials as the former already has its teaching and learning materials graded according to levels. Such EE resources are defined by Shongwe, (1996:112) as all books, booklets and pamphlets, test kits, posters, videos and slides audiotapes, buildings, parks and any other gadgets, which may aid EE.

Some EE teaching and learning materials which could enhance awareness development are EE programmes which should aim at integrating conceptual knowledge with sensory and perceptual development. Curriculum enhancement should influence attitudes and behaviours of human beings as part of the environment such that they become aware of environmental problems, and a feeling of concern for the environment develops out of which environmental action can arise, thus motivating learners to act for the environment (Chacko, 2000:51, Queiros, 2001:67, Burge, 2003:4, 56,101). Developed materials should aim at assisting teachers directly in teaching nature study in schools and that include nature study materials and reference EE library for instructional materials for each grade level (Ham & Sewing, 1988:23, Jenkins & Swinnerton 1996:184). Another form of resources materials should be resource s supplying and providing approaches for integrating EE into existing curriculum (Irwin, 1993: 85, Kanyimba, 2002:22, 24).

According to Ignacimuthu (1998:309), for environmental awareness to develop new educational materials in the form of teachers' guide books, hand books,

illustrative charts and teaching aids are also required to be developed. Riley (1985:76) and Bouma (1993:12) see development of EE awareness relying on provision of children literature which uses accurate information about the environment as it grasps children's emotions, interest and imaginations and shape children's awareness of their environment. Shongwe, (1996:113) sees material, which encourages stimulation and participation as the most suitable because it emphasizes active exploration, debates on controversial issues, interaction and participation with engagement in issues.

According to Jacobson and Padua, (1992:292) Kinabalu Park of Malaysia supplies a teachers' guide to all visiting schools to the park. Such guide provides background information about the park's ecology and detailed instructions concerning the students' park activities. In helping students to identify the animals during their visit to the park they are supplied with check-off identification sheets from which they check off the sheet all the animals they have seen. Apart from the teachers' guide developed and distributed at this park a revised booklet and follow-up worksheets and outcome tests are in use for both primary and secondary school teachers and learners.

From The Latvian Vak Green Centre educational materials developed by the Norwegian and Latvian Ministries of Education based on chosen environmental educational topics studied at different schools and published in written form are distributed to teachers.

Goldfields EEC of Pilanesberg Game Reserve facilitated in the revision of Std 3 and 4 Geography syllabi in order to include ecology, putting more emphasis on the relationship between human beings and the environment (Irwin, 1993:107).

In order to cope with the evolutionary role of EECs, Durban, Dundee and Eshowe EECs help schools with the development and infusion of learning programmes in schools with an aim of developing environmental-friendly students who protect and improve the environment (Burge, 2003:51). Dundee EEC has a well-equipped educational media centre containing reference books, DVDs, videos and posters which are environmentally aligned.

Letaba EEC provides brochures and booklets containing EE programmes, which could enhance awareness, but most of the materials supplied by Letaba EEC come from Share net. Such EEC brochures and booklets are free of charge on request, but only a limited number is available (Kirsty, date interviewed, 22/03/2005).

Stanley River EEC maximizes EE opportunities for students, teachers and school communities through designing, developing and providing specific resources to schools, providing assistance in the use of those resources and collecting and evaluating available resource material (http://www.stanelelyreec.gld.edu.a general-page/html, date of access, 2005/07/06

Bilai EEC on the other hand has a library of program support materials including centre -developed CDs. Such materials cover a wide range of topics available for loan by the clients of the centre (http://education.gld.gov.au/schools / environment/outdoor/bilai.html, date accessed, 2005/07/06).

2.3.10. Affiliation to Environmental Educational bodies.

Several EE bodies offering registration to interested people are available (e.g. EEASA, WESSA) (http://www.eeasa.org.za/index.php?page=0,date of access, 2006/05/08). They provide newsletters, conferences, academic journals and workshops contributing to environmental education to those affiliated to them. By affiliating to such bodies an individual or groups receive up-to-date information, environmental advices, environmental procedures and motivations on how to take action in order to curb environmental ills and problems.

In order to yield awareness through affiliation, exposure of environmental educational bodies to majority of people, simplified joining procedures of such organizations and making them accessible to all is needed and encouraged.

During teachers' workshops and seminars in the EE centres, teachers were given application forms for EEASA and encouraged to register at Thohoyandou Community EEC. From Letaba EEC most of the materials used are prepared by Share net and individual teachers are given its address so that they can become customers and buy environmental equipments at lower prices, use them in carrying out environmental educational activities leading them and their pupils into becoming environmentally aware (Patience, date interviewed, 22/03/2005).

Affiliation and support to My Acre of Africa EEF is through buying environmental bricks, which are laid down as a monument in the park. Each brick bears the name of the donor and the funds raised are used in protecting wildlife against extinction through improving relationship between the park and communities (Patience, date interviewed, 2005/03/22).

2.3.11. Provision of sponsorships, incentives and bursaries.

As the survival of environmental education rests on funding like any existing programmes, and it is meant for participation of all, and our society is divided into economic classes, in order to make everybody to be part of EE, the gap between economic classes should be closed through “the haves” sponsoring “the have nots” or offering them incentives in order to participate and take part in EE constructive programmes (DEAT, 1999:4).

An incentive, which could help in awareness development, is what was suggested during the Tbilisi conference (1977) that Unesco should consider creating a special prize designed to recompense the most outstanding activities and contributions in furthering the advancement of EE.

Another field where sponsorship could be utilized in the development of awareness could be the offering of part-sponsorship and support for further studies and improvement of qualifications through studying environmentally related qualifications (Irwin, 1993:96).

Studies or grants given to disadvantaged communities to come into contact with nature (e.g. taking them to the sea side, forest or mountain or excursions from four days to two weeks in environmental centres) could do wonders in enhancing environmental awareness (Jenkins & Swinnerton, 1996:187, Burge, 2003:54).

According to Jacobson et al (1997:39), from a research conducted it was discovered that an overwhelming majority (98%) of the environmental educational centres reported that minorities in USA attended environmental interpretive

programmes through school visits. From the above statement it becomes clear that some form of sponsorship need to be awarded to majority's schools in SA for them to take part in environmental interpretive programmes through school visits if we are serious about environmental awareness developed in majority groups for they form the majority part of "the have nots". Awareness to minorities groups could also be developed through providing incentives like environmental related parties or picnics which may involve part or the whole family where environmental awareness messages are supplied to such visitors (Jacobson et al, 1997:41).

Apart from offering sponsorship, EECs stand a better chance of arranging Rotary Funding or seeking funding on behalf of disadvantaged communities which could be channelled towards the development of environmental awareness (Burge, 2003:54).

Apart from granting groups discounted prices and keeping the prices (cost) low such that many learners could afford, Dundee, Durban and Eshowe EECs went a step further. In 2002 Dundee EEC sponsored a full week all expenses paid environmental excursion for two 'previously disadvantaged' schools in order to further their environmental awareness. During that period they had everyday contact with environmental educationists and the environment (Burge, 2003:54). Durban EEC also sponsored another school from its jurisdiction for a week-long environmental excursion. Eshowe EEC on the other hand arranged Rotary Funding for a one-day excursion for learners and three days workshops for educators. From these centres awareness was to be developed from both sides (i.e. teachers and pupils) such that each part shall help the other part in becoming environmentally friendly (Burge, 2003:54). The three centres also used "cross-subsidisation" where they charged groups from outside Kwazulu Natal province higher amounts from which the difference is utilized in meeting minimum

financial requirements for learners from ‘disadvantaged schools’ so that they could visit the centre and use its facilities free of charge (Burge, 2003:54,56).

From Letaba EEC according to Patience, (date interviewed, 22/03/2005) the form of incentive given to school groups is free entrance to the park and centre. First four groups of eighty pupils each day are allowed to enter free of charge but subject to prior booking and are compelled to spend an hour at the EE centre educated about an environmental topic of their choice. During that one hour awareness is developed through a lecture given, activities conducted with them and a film show shown to them Kristy, (date interviewed, 22/03/2005). By being given free entrance they also could use all resources and facilities at the centre and the Kruger National Park.

From My Acre of Africa EEF subsidy is offered but according to target audience. Most targeted audience were groups where there is a high need of awareness development e.g. (communities bordering the park) receives full cost-recovery such that they spend much time in the park and develop its lifestyles which they are going to take home and practise. As individuals such people are given free access to the park whereas less-targeted audience are given discounted prices (http://www.myacreofafrica.org, date of access, 2005/06/06).

From Nakuru Education Centre citizens of Kenya pay a discounted price whereas the gap between real and subsidized prices is covered by raising prices for foreigners. Apart from such lowering of prices there is a discount for students, which give them an advantage of using the centre’s accommodation (http://www.kws.org/nakuru-edu.html, date of access 2005/07/07).

Visitors who visit Nairobi Education Centre have an advantage of viewing a free video show on weekends although paid for during the week. That becomes an

added advantage to students as they become free on weekends and could make use of such a facility (http://www.kws.org/nbi-edu.html, date of access, 2005/07/07).

Fanfling Environmental Resource Centre offers schools and non-governmental organizations opportunities of using lecture rooms for organizing environmental workshops or seminars free of charge. Apart from lecture rooms the centre is open to public with free admission where guided visits and environmental education programmes for schools and community groups are offered by the centre's staff free of charge through advanced booking (http:www.epd.gov.hk/epd/English/ enviro-education/enviro-resourcectr/resour….date of access, 2005/07/07)

2.3.12. Environmental celebrations and modelling of environmentally acceptable behaviours.

Special environmental days such as Arbor Day, World Environmental Day are celebrated during specific days where when celebrating for that specific day awareness should be awaken by sharing a little history about the day, how it came about and what can we do to make celebrating it a reality (dream come true) (Ignacimuthu, 1998:310).

Special environmental days like World Environmental Day are celebrated yearly by government departments, academic institutions, universities, colleges, schools and voluntary organizations through organizing activities which will depict the state of the environment and bring that to the attention of participants, spectators and invited guests such that their awareness of the state of their environment is aroused. Activities, which could be undertaken during that day, include

environmental competitions for children, visits to national parks and sanctuaries, identification and solving of local environmental issues (Ignacimuthu, 1998:310)

Another way of celebrating environmental days could be to provide materials to groups which they will have to develop while such materials will also develop their environmental awareness and abate environmental problems e.g. providing schools with tree seedlings during Arbor Day which they will have to plant and care for them. Celebrations could also include displaying of environmental artefacts produced during the year and drawing of posters highlighting the plea of the environment.

Celebrations could also be done in combination with other interested structures and bodies like Sportsmen Protecting Our Resources Together (S.P.O.R.T.) and FIFA where environmentalists will give keynote address addressing environmental issues of common interest like littering, recycling etc (Riley, 1985:60).

From New Jersey Audubon Society-Scherman Hoffman Sanctuary celebrations for special environmental days take different forms. Prior to the day school groups take part in different programmes like studying trees and insects living in them, water and air quality testing etc. Such programmes are organized into presentations, songs, making a music video or a play, which are then presented during Earth Day's celebrations (Santiago, 1999:28).

Letaba EEC on the other hand does not go out but celebrate such days with visitors who have visited the park and the centre. The celebration could either be celebrated indoors or outdoors depending on the activities to be done. In all celebrations small speeches have to be offered showing guests the need to care for our environment through doing what specific environmental days require them to do (Kristy, date interviewed, 22/03/2005).

2.3.13. Environmental exhibitions and displays

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Exhibitions of environmentally friendly products create awareness about the issue they are said to have or does not have e.g. CFC-free deodorants create awareness of the existence of chlorofluorocarbons which create ozone depletion and will lead an individual into a need of knowing more about ozone depletion. Advertisement boards, score-boards in different games and video-boards could be utilized in displaying environment related messages which will in turn create awareness to both players and spectators Riley, 1985:60).

Displays are suitable according to Engleson &Yockers (1994:121) for creating awareness for they are self-teaching and may take several forms which could interest more people e.g. photographs, models, charts, posters, audio-visual equipments, computers or real object as alone or in combination. Programmes, which could be, exhibited aim at attracting persons who initially may be less interested in such an environmental activity (Jacobson et al, 1997:41). Some environmental things, which could be displayed in order to develop and enhance environmental awareness, may include a display of an institution's environmental audit findings, which will show how an institution fares in relation to standardized environmental norms and that will develop in them a desire or craving to do something in order to improve the findings. Within the institution signs of footprints could be placed in areas where people are having an environmental impact and showing what impact they are developing so as to make them aware of their impacts and the need to improve on the impact and become more environmental friendly (DEAT, 2001:27).

Letaba EEC has several posters of endangered species and the effect of man on the ecosystem (mostly poaching), which is being discouraged at all cost. Historical events are also depicted from the pictures and banners with environmental information. A statue of an elephant at the entrance of the centre keeps reminding visitors how endangered elephants are for their ivory through poaching and the plea to save the African elephant from extinction. The display of the traditional village set-up (Massourini) shows how traditional villages previously related and respected the environment (Patience, date interviewed, 2005/03/22).

From My Acre of Africa a floodlit waterhole is created from which learners are presented with information on animal behaviour. The waterhole is linked to live or created exhibit exploring aspects of life in and around the floodlit waterhole from micro-organisms in the water to creation of depressions which will create opportunities for experimentation and observations. A fresh water aquarium is available which focus on revealing the biodiversity of the river system within the park which visitors do not practically get opportunity to experience when visiting the park (http://www.myacreofafrica.org. "A living Map" of the Kruger National Park, date of access, 2005/06/06).

The Environmental Exploration Exhibit Clusters contain streaming videos, audios, touch screens and virtual reality which help learners in exploring relationships between human society and the environment in relation to time. In order to be self-explanatory each exhibition have one large question, which is the focal point it addresses surrounded by a whole range of smaller related issues and questions it raises across time and space (http://www.myacreofafrica.org, date of access, 2005/06/06).

Delta EEC started a Sasol sensory trail, which is also made accessible to the disabled. Along the trail are signs highlighting sensory focuses in each section coupled with interpretations for assistance. In order to accommodate the visually challenged, signs are also in Braille. The trail helps in helping viewers appreciate aspects of nature which do not first come to mind like, temperature, texture, aroma and shape of the environment (http://www.deltaenviro.org.za/trails/index.html, date of access, 2005/07/06).

The interior of Fanfling Environmental Resource Centre is in itself a form of display. Its fittings are made from environment-friendly materials and the furniture made from recycled materials. Several exhibitions halls are available from the centre aiming at creating awareness of what is being exhibited for example:

* “clean air for you and me” exhibiting sources of indoor and outdoor air pollutants, their impacts on us and measures to improve air quality.
* “world of silence” introduces sources of noise pollution, their control methods and mitigating measures.
* “reduce waste start from me” shows how waste are reduced, recycled and disposed. Exhibits of recyclable materials, recycling process and final products of recycling are also shown.
* “protect our water resources” introduces wastewater treatment, how water qualities are monitored, water pollution control measures; water sampling and measuring instruments are displayed.
* “environmental planning and assessment” section shows how adverse environmental impacts on the environment can be minimized by adopting environmental protection measures at different stages.
* “global environmental issues “ section shows greenhouse effect, ozone depletion and loss of species (http://www.epd.gov.hk/epd/english/enviro-education/enviro-resourcectr/resour….date of access, 2005/07/07).

2.3.14. Environmental competitions.

Environmental competitions emanate from corrections made about environmental problems on the environment according to a stipulated theme.

Essays writing and debates about EE topics according to Riley (1985:96) could yield another form of competition and awareness as before writing the essay the student shall have to require help from his parents and siblings and as such make them aware during the process of the occurrence of an issue written about.

Environmentally, competitions could also be about giving a news report on an environmental issue, dramatizing an environmental feeling felt by creatures in relation to their cruel treatment, and composing poems about the deteriorating state of the environment (Opie, 1992:56, Allers, 1997:45).

On the spot painting, modelling and poster design could bring about remarkable results with prizes of such competitions including visits to the nearest environmental park where further awareness could be enhanced. Essays and debates further create awareness according to Queiros (2001:70) because they develop learner's abilities to voice opinions, address contentious issues, participate in discussions or debates and take decisions. Competitions like the one sponsored by OK and Mazda called EnvirOK help in creating awareness and solving problems.

From Dundee EEC all teachers who participated in workshops ran by the centre were given free enrolment to the Eco-schools' project aiming at environmental awareness and significant social change. In order to complete the project and be

awarded an ‘Eco- School Flag’ they have to engage in their own contextually-based, self-driven, locally engineered solutions to environmental issues facing their schools and communities (Burge, 2003:71-72).

Letaba EEC has a poster-development competition where pupils from schools neighbouring the centre have to develop a poster sketching their understanding of conservation and people’s involvement in environmental management. From the posters pupils need to show as to what do they, understand about conservation and what part are they playing in environmental management. The winning poster shall be printed on the mobile bus spreading conservation and environmental education message to schools and communities bordering the Kruger National Park. Prizes ranging from art kits, golf shirts and a night in the Kruger Park and one day environmental education tour are won in this competition (Patience, date interviewed, 2005/03/22).

Another competition from the centre is “Kids at Kruger” where pupils from participating neighbouring schools are invited to the park to compete. Competitions are on essays, debates, paintings and drama based on environmental management and conservation topics. Winners get an opportunity to visit the park and become the centre’s guests. Activities of that day included lecture on an environmental topic, film show and a game drive in an open vehicle for the remainder of the day accompanied by a tour guide (Patience, date interviewed, 2005/03/22).

2.3.15. Environmental Games.

Children learn by playing and playing makes learning to become fun, as such games would help much in environmental awareness development. Games and role-play are used in EE for they encourage learning. Such learning is learning through the environment where through playing he attaches meaning to his life-world and initiates relationships with himself, other pupils and the environment surrounding him (Stuart, Van Niekerk, McDonald and De Klerk, 1987:66).

Environmental games according to Mcrae, (1990:120) should form part of nature centres' programmes as they teach pupils about environmental matters and also allow children to enjoy themselves in the new environment. Traditional childhood games based on themes from nature according to Irwin, (1993:74) are of importance for they develop social attitudes and moral responsibility. Interactive teaching and learning where games and role plays are used is encouraged in EE based on the notion that when one is physically involved in doing something he/she is not likely to forget it, unlike when it was narrated or lectured to him (Shongwe, 1996:109).

According to Clements (1995:82) Environmental Awareness Board Game should be developed which helps in awareness development in an interdisciplinary manner for it incorporates physical education, reading, maths, science, music, art and writing in the learning activities.

At Kinabalu Park students play specially created games to find traces of animals and to identify them through their sounds (Jacobson & Padua, 1992:292).

The Elders from Canada' s CIER believe that training in environmental protection first begin with traditions, customs and values that have engaged generations of

their ancestors intimately with the land. Through playing traditional games having a bearing on the environment, students become aware of and develop traditions, customs and values about the land and its inhabitants (Jacobson & Padua, 1992:292)

Goldfields EEC's social responsibility and moral attitudes are developed through traditional childhood games based on themes from nature. Animals' character are imagined such as the astute Mmutla (hare), the imperious Tau (lion) and the mischievous Ratwe (baboon) (Irwin, 1993:74).

Eco-Puzzles from Share-Net create awareness in pupils about the existence of an ecosystem, maintenance of such and interaction between members within an ecosystem and could be a good game to introduce and play (DEAT, 2001:4).

From Letaba EEC Eco-Puzzles from Share-Net are used in awareness creation while using them and filling in the missing environmental information. Environmental Board Games adapted from "Snake and Ladder Game" are also used. After questions were asked about EE matters, points are awarded and the first person to reach an environmentally friendly home wins. Cultural games adapted to environmentally acceptable standards are told by retired rangers. Games adapted from strategies used in hunting poachers are taught. Other games include role-playing environmental creatures, which are erring their views about the treatment they are getting from human beings (Patience, date interviewed, 2005/03/22).

Fanfling Environmental Resource Centre has a community education interactive station. At this section interactive and educational computer games are provided in the computer gallery to arouse public's environmental awareness

(http://www.epd.gov.hk/epd/english/enviro-education/envir-resourcectr/resour, date of access, 2005/07/07).

Molesworth Environmental Education Centre have team building activities and co-operative games which facilitate environmental behaviour management and problem solving strategies in schools (http://www.education.tas.gov.au/annual report/98-99/outputGrouploutputs/F, date of access, 2005/07/07

Through applying the above-mentioned environmental awareness development strategies, EECs will be performing the roles, which it is supposed to perform as being stated in the following section.

2.4. Roles of environmental education centres.

Environmental education centres have both environmental and educational roles. Both of these roles shall be dealt with in this section. Environmental roles of EECs emanate from both learning for and through the environment. These roles are concerned with the transfer of environmentally acceptable feelings, attitudes, behaviours and actions by the EECs to their clients. That is achieved through portraying and instilling environmentally acceptable standards and requiring their clients to live up to such portrayed standards. Environmental roles aim at gaining of environmentally accepted skills and attitudes, which guarantees readiness of and correct solving of environmental problems. Educational roles of EECs on the other hand, emanate from learning about the environment, where environmental knowledge need to be guaranteed and made available (accessible) to both teachers

and pupils (Bornman,1997:60). Knowledge about the environment enables pupils and teachers to notice environmental abnormalities and acquaint themselves with environmentally acceptable problems resolving knowledge.

2.4.1. Environmental roles of environmental education centres.

Environmental roles of EECs emanate from learning for the environment where behaviours and actions are to be performed based on gained environmental knowledge (Bornman, 1997:60). These roles are responsible for offering hands on application aiming at solving environmental problems in their surrounding environments (Wass, 1990:1, Chacko, 2000:32, Maila, 2001:16).

Roles to be considered include provision of environmental encounter between pupils and the environment, creation of environmental awareness, development of concern and appreciation for the environment and helping in portraying the state of the environment to pupils and teachers and turning environmental theory into practice. Elaboration of each of the above-mentioned roles follows.

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2.4.1.1. Providing environmental encounter between pupils and the environment.

According to Oberholzer, (1988:26) and Macrae, (1990:111) EECs provide specialist environmental encounters with the environment, which schools cannot provide. Such an encounter yields a better understanding in pupils of nature as being part of them.

Encounters manifest themselves in the form of:

* acting as a trip destination for schools where schools can organize fieldtrips relating to all areas of the curriculum as a fulfilment of the requirement required by the education department (Shongwe, 1996:169).
* providing sites for students from pre-school to grade 12 to undertake fieldwork relating to all areas of the curriculum.
*encouraging families and schools to visit the centre and take part in environmental programmes they are offering.
* assisting in extending and promoting co-operation between various cultural groups using and visiting the centre.
* supporting efforts to create stakeholder associations and promote alternative economic activities, which are environmentally sound.
* developing environmental sensitivity through long-term interaction between students and their natural environment (Jacobson et al, 1997:40)
* supplying more apparatus which could be used in making more effective observations because they have more and advanced apparatus which schools do not have (e.g. binoculars, microscopes etc) and developing the joy of using one's senses as fully as one can (Allers, 1997:28).

offering residential and study facilities available (e.g. habitat type nature and nature trail sites having stopping places where students can observe and record information) for those who want to study more about the environment as some of the activities cannot be completed in only one day hence the necessity for accommodation and residential facilities.

* organizing group outing programmes such that they are perceived as an outing with an educational importance rather than seen as a fun outing (Burge, 2003:41).
* programmes as embarked on by Delta Environmental Education Centre where the centre facilitated in helping disabled people in interpreting their environment (http:/www.deltaenviro.org.za/geoff, date of access 2005/07/06

2.4.1.2. Development of a concern and appreciation for the environment

EECs need to develop curiosity, care and concern for the environment from both teachers and learners. This is the task that could be realized by environmentalists with necessary skills to develop environmental experience in children in a variety of outdoor settings (Macrae, 1990:14). Further appreciation is achieved when EECs provide clearer understanding of, and develop deeper feelings towards “the Earth”. From such appreciation arise positive environmental actions which motivate learners to act for the improvement, maintenance and management of the environment (Queiros, 2001:67, Kanyimba, 2002:28, DEAT, 2004:3).

According to Opie & Schuil (1993:23) concern and appreciation of the environment is achieved when EECs show children active ways of making their own contribution to the health of the planet, no matter how small rather than making them feel helpless or guilty about the ill of the planet. Concerns and appreciation of the environment should culminate in the formation of an environmental ethic which according to RDP document in Shongwe, (1996:158) is developed through development of EE programmes empowering communities.

2.4.1.3. Creation of environmental awareness.

According to Yeld in Shongwe (1996:157) awareness creation is a primary role of any EEC and should be done through exposing pupils to and informing them about the environment. EECs according to Maila, (2001:19) have to develop awareness and understanding of the fundamental importance of ecological processes and how they relate to an individual and the community. Because EECs have to treat awareness and syllabus-related topics in their everyday activities, they have to structure their activities such that awareness creation gets first priority (Shongwe, 1996:159) That would be realized through promoting awareness and positive attitude development of the total environment and developing in individuals a concern for the well-being of the environment and the quality of life of the inhabitants. According to Bouma, (1993:12) awareness could be achieved through organizing and motivating pupils to take part in environmental celebrations like 'World Environmental Day' and environmental competitions, which develop awareness and improve the state of the environment. Another way of creating awareness according to Shongwe, (1996:108) is through letting pupils participate in games, role playing and carrying out simple experiments as that involve pupils physically and take their full attention (Shongwe, 1996:108).

Stanley River EEC aims at helping children acquire an awareness of and sensitivity to the total environment (i.e. personal, natural and social) (http:/www. stanelyreec.gld.edu.au/general-page2.html, date of access, 2005/07/06). Environmental awareness could also according to Shongwe, (1996:112) be created when EECs offer prominent messages, which need response about environmental ethics.

2.4.1.4. Helping in portraying the state of the environment.

Not all pupils and teachers have environmental knowledge, which could let them analyze and see the real standard of the environment and the consequences of such an environment to their lives. EECs should then persuade teachers and pupils to take into cognisance that environmental issues are directly related to their living standards (Cornwell, 1996:83)

Because of the above, EECs should enable people to understand the complexities of the environment and the need for nations to adapt their activities and pursue their development in ways which are harmonious with the environment (Unesco, 1977:12). According to Usang, (1992:47) EECs have a role to notify people that environmental problems have no political or radical boundaries because the consequence of an environmental crisis is like an ill wind that blows nobody any good.

2.4.1.5. Helping in turning learnt environmental theory into practice

The main aim of EE is to make pupils aware of their environment such that they will care for and protect it. That is done through applying the theory gained from environmental knowledge which EECs need to develop in pupils by treating those parts of lessons which could not be handled at schools either as a learning item or a teaching topic (Yeld in Shongwe, 1996:157). According to Transvaal Educational News (1993:21) EECs have to help in applying gained theory through

confronting children with fundamentals of environmental education as they have facilities affording the young opportunities to experience life positively and contribute to dealing with environmental issues in their immediate vicinity. EECs should offer pupils opportunities to think creatively about their environment through letting them solve local environmental problems as they occur EECs also help through becoming community centres which serve local communities by becoming resources centres containing educational materials and equipment which many schools cannot afford (Burge, 2003:130-131). An example of a situation is where EECs help schools in conducting environmental audits of their environments and facilities, which help schools in determining as to how do they fare in relation to environmental standards from such audits.

EECs should take it upon themselves to show children active ways through which they could make their own contribution in relation to the audits ‘ results, no matter how small it may be rather than making them feel being helpless or guilty about the ills of the planet (Opie & Schuil, 1993:23).

2.4.2. Educational roles of environmental education centres.

Environmental education centers have a role of transferring knowledge and understanding to people so that based on that, they could take part in improving and managing their environment. Educationally environmental education centers have the following roles which will be outlined in the next sections: teaching roles, training roles, development of environmental resources to be utilized in enhancing environmental awareness and developing in both pupils and teachers environmentally acceptable attitude.

2.4.2.1. Teaching roles

Teaching roles of EECs are only in the form of enhancing what is taught at schools by showing a different approach, different methods towards it and consolidating what is being taught at school (Shongwe, 1996:161). That is realized according to Shongwe, (1996:107) by changing the perception in teachers that nature is not only found in parks but are always in contact with in their homes. In line with the above, it could be achieved through teaching teachers how to use their school grounds in an environmentally, economical and educationally cost effective way in order to reduce long-distance excursions which could be both costly and risky (Ham & Sewing, 1998:22, Irwin, 1993:130, Burge, 2003:41).

Another role is teaching skills to other situations demanding application of such skills (Bogan, 1973:2). According to Macrae, (1990:111) and Lebeloane, (1998:12), EECs need to develop environmental awareness and environmental knowledge through teaching in an environmentally directed way. That is a way of making education more relevant to learners by EECs through linking education with their everyday life. That could be achieved by EECs referring to what they do either as against or for EE goals and objectives (Shongwe, 1996:100). EECs also need to help teachers in evaluating their EE programmes, environmental policies and their awareness development techniques from time to time and adjust them to such times' needs (Shongwe, 1996:176). According to Maila, (2001:13) EECs should also teach pupils about political, economic and socio–cultural factors which influence decisions about the responsible use of the environment and its resources. Grading of EE content according to grades and specifying the scope of EE that need to be covered as per learning band or grade is another role of EECs. EECs according to Burge (2003:81) have to offer active learning where learners

learn by doing, experiencing and solving problems, which they encounter on their daily basis as opposed to transmission. According to Maathai Wangari in City Press (2004:8) another role of EECs is to warn people about the risk at which the environment is at from human activity.

Nakuru Education Centre is responsible for creating wildlife conservation awareness by providing information to the general Kenyan public and visitors through education programmes. That is done with an aim of making Kenyans appreciate and support wildlife conservation for its biodiversity, aesthetic, cultural, scientific and economic value (http://www.kws.org/nakuru-edu.html, date of access, 2005/07/07).

2.4.2.2. Training of teachers

One of the roles, which EECs should perform according to Shongwe, (1996:156) is for an EEC to act as a facility for training teachers. Such training could be in the form of workshop and seminars conducted for teachers on how best can they use the existing EE books and take part in effective fieldwork (Opie, 1990:43, Macrae, 1990:111, Irwin, 1993:85, Kanyimba, 2002:81). According to Riley,(1985:37) EECs are there to conduct mini-clinics about acceptable consuming strategies which are sustainable.

From these workshops and seminars EECs according to Riley, (1985:36) and Klause, (1990:9) should train teachers the skills of leading children out safely in excursions and effective use of natural resources in order to yield better learning in practical settings. Also they need to train teachers in the recognition and nurturing of an aesthetic awareness and sensitivity towards the environment. This is

achieved through providing numerous opportunities for students to maximize the use of their senses in a wide variety of environments both natural and man-made (Engleton & Yockers, 1994:19,119. Allers, 1997:19-20). EECs according to Shongwe, (1996:164) are there to expose teachers to a variety of teaching techniques and methods rather than teaching the methods. Newly trained teachers should be provided with exposure to receive information, which enables them to start a teaching career with a little extra awareness of environmental issues and problems (Shongwe, 1996:167).

Stanley River EEC includes the demonstration of strategies for teaching EE as one of its aims. It realizes that through conducting workshops for local teachers and train them on such strategies which will help in enhancing awareness development (http://www.stanelyreec.gld.edu.au/general-page2.html, date of access, 2005/07/06). Another direction into which training of teachers should take according to Shongwe, (1996:168) is that of training teachers to be innovative and to improvise where resources and facilities are lacking.

2.4.2.3. Development of environmental resources.

EECs' educational role should aim at developing resources material for both teaching and learning for teachers (e.g. learning programs, schemes of work) and children (textbooks, hands on tools, journals). Such resources could be adapted for individual needs and in relation to time and circumstances. EECs should encourage teachers to form clusters, where they share their classroom ideas and experience of incorporating and teaching EE (O'Donoghue & Taylor, 1988:4, Ham & Sewing, 1988:21, Mcrae, 1990:110-111, Jenkins & Swinnerton, 1996:186, Maila, 2001:19-20, Kanyimba, 2002:22,78, Burge, 2003:51).

They also need to become service centres providing venues from which non-formal and informal ongoing re-education of educators can take place together with being a research facility for educators in lesson preparation and personal academic improvement (Shongwe, 1996:171, Burge, 2003:125, 128).

Apart from acting as a resource centre within EE, Stanley River EEC also designs, develops and provide resource materials to schools. The centre also provides assistance in the use of such resources (http://www.stanelyreec.gld.edu.au/general-page/.html date of access, 2005/07/06).

2.4.2.4. Development of environmentally acceptable attitudes

EECs have a role of creating positive attitudes in teachers about EE and the teaching of such through pre- and in- service teachers training aiming at developing personal interest and commitment to EE (Ham & Sewing, 1988:18, 23, Macrae, 1990:111, Ignacimuthu, 1998:309, Burge, 2003:49). They also have to convince teachers that the content of "not having time" to teach EE is not genuine by showing them that EE is not a new subject but needs to be treated inter- and multi-disciplinarily through bringing environmental concerns in all subjects areas (Ham & Sewing, 1988:20, Ignacimuthu, 1998:292). According to Allers, (1997:25), EECs have a duty of changing the perception of children that wildlife is found in outside environments by letting them rear them and bringing them into contact with them as always as possible.

The changing of people' attitudes such that they develop a positive concern for the environment and wildlife conservation is portrayed by Tsavo East Education Centre. That is achieved through winning people's appreciation and support for

natural resources conservation (http://www.kws.org/tsavoeast-edu.html, date of access, 2005/07/07). EECs according to Robottom & Hart in Shongwe (1996:99), should provide opportunities for students to become educated about the environment by letting them experience it directly and emotionally. Such an above-mentioned provision will results in the building of a sense of relationship through feelings and understanding of the natural world.

2.5. Conclusions.

The following conclusions could be drawn from the preceding discussions viz: that:

* EECs are better suited to develop learning about, through and for the environment. Such knowledge is supplied to teachers and pupils, environmentally acceptable feelings and attitudes are developed together with environmentally acceptable behaviours and skills practiced.
* EECs have both environmental as well as educational roles which need to be carried out in order to achieve learning about, through and for the environment. That is achieved when EECs empower teachers and pupils through supplying them with knowledge and skills, which after implementing knowledge and practicing the skills will results in change in attitudes for the better of the environment.
* the above-mentioned roles are realized through implementing several environmental awareness techniques. All the strategies or techniques should aim at realizing the primary role of EECs, which is the creation of environmental awareness to their neighbouring teachers, pupils and communities.

From the literature reviewed it was noticed that there are several strategies of developing environmental awareness, and in the next chapter it is going to be investigated as to which strategies is Schoemansdal Environmental Education Centre using in developing and enhancing already existing environmental awareness from its neighbouring schools.

CHAPTER 3

RESEARCH DESIGN AND DATA COLLECTION.

3.1. Introduction.

This chapter will treat the research design type and data collection techniques used for this research.

The type of research design used will form the opening part of this chapter. Following on type of research design will be data collection techniques used in collecting data for the research. An elaboration of piloting done prior to the undertaking of the research will be the next part to be treated with ethical issues to be followed in order for the research to be ethically acceptable concluding the chapter.

3.2. The design of this research.

Research design according to Searman, (1987:165) refers to a way in which the researcher structures and plans the research process providing flexible guideposts keeping the research headed in the right direction. Welman and Kruger, (2001:46) view it as a plan according to which researchers obtain research participants and collect information from them, describing what we are going to do with the participants in order to reach conclusions about the research problem. De Vos, Strydom, Fouche' and Delpoort (2002:271) view it as all those decisions a

researcher has to make in planning the study which includes groups of small, worked-out formulas for carrying out the research.

For this study, research design shall offer a clue about how the population shall be trimmed into a sample and how data was collected from them and analyzed. As collecting data from the sample has to be done in an ethically acceptable manner, ethical considerations for conducting the research shall be included.

The research design is a qualitative, explorative (survey) descriptive, historical case study design. Qualitative research design was chosen as per its definition that it is a naturalistic inquiry using non-interfering data collection strategies (Schumacher & MacMillan, 1993:372). Such strategies are used in order to discover the natural flow of events and processes and how participants interpret them.

Qualitative research design was used because the researcher wanted to hear how teachers interpret the activities of SEEC in relation to helping them in changing their view of the environment or not.

The research design was descriptive because the researcher wanted to describe current data (Searman, 1987:181). The data to be described is what is the centre doing at present about the creation of environmental awareness. Another reason why the design was descriptive was because the researcher wanted to describe and evaluate the awareness development programmes in the light of the primary role and objective of an EEC (i.e. creating environmental awareness and investigate holistically how the programme works) (Meriam in Shongwe, 1996:38, Shongwe, 1996: 156-157).

Historical design was used because part of what is being researched had occurred in the past (i.e. what the centre was previously doing in order to create environmental awareness) (Searman, 1987:185). Historical design was used here when collecting material that already existed without interfering with what was happening at that moment, describing, analyzing and interpreting such material.

Case study design as a study, exploration or examination of a limited number of cases at a specific setting (Shongwe, 1996:45, Welman & Kruger, 2001:182, De Vos et al 2002:275) was also used. It was used for it is a source of stimulating insights which could help in getting a whole from the diverse bits of information. The whole intended to be created was the creation of environmental awareness from several activities carried out at the centre.

Case study design according to Schumacher and MacMillan, (1993:377) is appropriate in evaluative studies. It was found to be relevant to our studies for our research aimed at evaluating whether environmental awareness is created or not. In-depth exploration as what a case study is all about will lead towards understanding the phenomenon, which is being, studied which is environmental awareness creation (Schumacher & MacMillan, 1993:377). In this research it was done through hearing what participants in the research (teachers and EOs) voiced, as that will increase the understanding of the awareness development programme (Shongwe, 1996:44).

In effecting the research design a sample, which Searman, (1987:233) sees it as chosen study subjects (elements) from a larger population has to be chosen.

Sampling could either take the form of probability sampling (where each member of the population has equal chances of being part of the sample) or non-probability sampling (where the probability of selecting the sample is not known (Searman,

1987: 234-235, Schumacher & Macmillan, 1993:594,596). For the purpose of this research both probability and non-probability sampling was used. Non-probability sampling in the sense that only schools from Zoutpansberg West Circuit, the circuit from where the EEC is found were regarded as information rich cases. They were taken as information-rich members for if the centre has to develop awareness it has to start from schools in that circuit as it is part of that circuit (Schumacher & MacMillan, 1993:378, Petersen, 1996:16, Patton in Shongwe, 1996:45). Probability sampling was used in that out of the total of fourty three schools in Zoutpansberg West Circuit (refer to appendix E), seventeen schools were chosen through random sampling procedures. Such sampling was done in such a way that each member of the population had an equal chance of being selected (De Vos et al, 2002:201)

The researcher visited Zoutpansberg West Circuit offices to request a list of all schools in the circuit in order to make a sample from the total population of schools in that circuit. Because there are less schools the researcher decided not to use a sampling table in drawing the sample. Instead the researcher gave each school a number from where all papers containing the numbers were folded such that the numbers cannot be seen, put into a hat and mixed. The first twelve from primary section and five from secondary section chosen (picked out) numbers from the hat were taken as the sample of the research. Because the circuit contains both, primary and secondary schools, samples for secondary schools were drawn separately from that of primary schools in order to have a sample of both (refer to appendix D)

After having a sample of schools to be used, permission was requested from Limpopo Education Department to conduct research in those schools (see appendix A) and another one for conducting research at SEEC as it is a departmental EEC (see appendix B). Teachers from sampled schools completed

questionnaires whereas an environmental officer was interviewed about how do they see the role of the centre in creating environmental awareness

3.3. Data collection techniques.

Methods for collecting data are not stipulated (defined) by the research type but by the problem and the presumed character of the object of the research (Shongwe, 1996:38-39). If the question is largely “how” as in the case of this research where information on how effective the environmental awareness programmes of SEEC are in developing environmental awareness, then the research is explorative and explanatory (Yin in Shongwe, 1996:38).

In agreement with what Keeves in Shongwe (1996:39) says, that no method is used exclusively or in isolation, the interview shall be the main data collecting technique coupled with questionnaires and document study. As the above-mentioned techniques are “soft approaches” (Bogan and Knopp Biklen in Shongwe, 1996:37) rich in description of events, activities and attitudes and are not easily handled by statistical procedures so will the data of this research be.

Following are the data collection techniques and how will they feature in this research.

3.3.1. Questionnaires.

Questionnaires refer to a set of written questions assessing attitudes, opinions, beliefs and or biographical information which have to be answered with little help from the researcher (Searman, 1987:275, Schumacher & MacMillan, 1993:275).

Because it is difficult and not possible to observe directly whether teachers at schools neighbouring SEEC have been made environmentally aware, but have to rely much on what they say, questionnaires become the primary means of collecting data (Searman, 1987:275).

Questionnaires were used because according to Searman, (1987:275) they are good at obtaining information about attitudes, opinions, perceptions, beliefs, feelings, motivations, private behaviours, past and anticipated behaviours, which this research is concerned with. They were also used because this research is only interested in gaining information and not who said it, and questionnaires are good at ensuring anonymity (Schumacher & MacMillan, 1993:238, Welman & Kruger, 2001: 147).

Another reason why questionnaires were used was that teachers are always busy during school hours and a questionnaire is the only data collection technique, which could be kept and completed at respondents' convenience (Welman & Kruger, 2001:147). Questionnaires (a sample of which is in appendix G) were completed by one teacher from each of the sampled schools.

Questionnaire shall be followed by the studying of documents in order to either confirm or refute the visits stated by teachers as reflected in the form of statistical records.

3.3.2. Documentations.

According to Schumacher & MacMillan, (1993:445) documents are written or printed material prepared in order to preserve a historical record or serve an immediate practical purpose. They could be official or unofficial, public or private and published or unpublished. Documentation is the study of such documents (Schumacher and MacMillan, 1993:445).

The following types of documents were studied for the purpose of this research.

3.3.2.1. Official documents.

Official documents are viewed by DeVos et al (2002:323-324) as formal and structured documents, which are compiled and maintained on a continual basis by large organizations.

Documents, which were looked at, included policy documents containing organizational rules and regulations together with organizational memoranda relating to awareness creation. Another group of documents included awareness creating brochures and letters together with awareness creating materials which included posters, exhibitions materials, teaching and learning aids and notes written and pasted on species.

The third type of official documents, were official statistics. They included statistics about the number of schools visited by EOs within a specific period (twelve months) and schools, which visited the centre within a specific period

(twelve months). From the statistics of schools, which visited the centre, further analysis was made as to how many visited after being visited by EOs, and how many after brochures or flyers were sent to them in order to develop a trend of visitation and reveal the history and how is the issue under investigation (awareness creation) regarded by different people. Statistics of post-visits by EOs to their schools was also viewed with an aim of determining follow-up activities of the centre to visiting schools. During such analysis of statistics more consideration was given to neighbouring schools. Further statistics reviewed included statistics of environmental awareness conducted, environmental exhibitions held and statistics about celebrations of special environmental days.

3.3.2.2. Mass media materials.

This category includes documents containing information about the centre and the centre's usage of the mass media institutions.

Media viewed from the centre were mostly audio-visual mass media, which included newspapers, magazines, journals, newsletters, videos and cassettes together with films and books. All the media mentioned above were studied as to how were they being of help in developing environmental awareness. The second type of mass media documents were scripts and recordings of presentations to organizations specifically newspapers and radios stations.

Information found from the study of documents shall help in directing and acting as points of reference during interviews, which followed after documents study.

3.3.3. Interviews.

Interviewing is a data collecting method where the interviewer asks the respondent questions either face to face or by telephone with an aim of understanding the world by the researcher from a participant's point of view (Searman, 1987:287).

Key-informant semi-structured interview was used in collecting data. This is defined as in-depth interviews of individuals who have special knowledge and skills about the researched topic who are willing to share it with the researcher (Schumacher & MacMillan, 1993:427). Key-informant interviewee in this instance is an EO from Schoemansdal who was interviewed about their role in creating environmental awareness at their neighbouring schools.

Interviews were used because the researcher wanted to have the interviewee give his side of the story. By allowing them to say it, a better understanding of the awareness development programme was achieved. According to Shongwe, (1996:44) results got where interviewee gave their side of the story (view) increase the use of evaluation results in decision-making.

Interviews were also used because it is effective in obtaining information about attitudes, opinions, perceptions, beliefs, feelings and motivations (Welman & Kruger, 2001:161) which is what this research aims to achieve.

Interviews were used according to De Vos et al, (2002:292) for the researcher wanted to understand the world from the participant's perspective (point of view). Through speaking the interviewee gave his own opinion, feelings and perceptions about whether their centre is creating environmental awareness or not.

The research schedule was based on the following themes as depicted from the schedule (see appendix H): contact between centre and schools, roles of EECs, resource development and training offered by the centre.

In order to make sure that the instruments and procedures to be used shall realise what is required, they need to be piloted.

3.4. Piloting.

Piloting is viewed as a small study conducted before the real research to determine whether the methodology, sampling, instruments and analysis are adequate and appropriate (Slavin in Shongwe, 1996:39, De Vos et al, 2002:211).

Piloting was done with an aim of showing the researcher how the methods or instruments designed will operate and what effect were they likely to have.

The research was piloted at Letaba EEC where two EOs (viz, Kristy and Patience) were interviewed on the 22/03/2005. Such a study helped a lot in shaping the study in the way it is. A pilot visit to SEEC was undertaken on the 05/04/2005, with an aim of accustoming the researcher with the venue and develops a relationship with EOs at the centre where few general questions about the centre were asked.

The piloting of the questionnaire was conducted with colleagues from Mpandeli Secondary School. This was done through letting few teachers go through the questionnaire with an aim of answering, refining, ordering, laying out and filtering of the questions.

Data collection together with piloting of the research should always be done within the compliance of research ethics.

3.5. Compliance with ethical issues.

The following ethical measures were taken when conducting interviews and distributing questionnaires in order to protect participants and obtain reliable information.

3.5.1. Informed consent.

Informed consent according to (Schumacher & MacMillan, (1993:183), De Vos et al,(1998:25) and Mouton, (2001:244) refers to providing subjects with the goal of the investigation, what the information will be used for, procedures to be used, possible advantages, disadvantages and dangers involved if any. Consent was received from participant through filling a consent form (see appendix C).

3.5.2. Deception of participants.

Deception of participants, according to Schumacher & MacMillan, (1993:182) and De Vos et al, (1998:29) is the withholding of (or offering of incorrect) information to ensure participation of subjects. No deception of participants was done in this

research since full disclosure would not have a negative impact on the validity of the research.

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3.5.3. Anonymity, confidentiality and protection from harm.

According to Schumacher & MacMillan, (1993:184) and Mouton, (2001:243) anonymity and confidentiality is making sure that the data collected is kept confidential and that participants will remain anonymous. Anonymity and confidentiality was achieved through using pseudonyms and code names for participants and institutions. Participants were protected from physical as well as emotional harm through informing them about potential impact of the investigation.

3.5.4. Debriefing.

Schumacher & MacMillan, (1993:185) and De Vos et al, (1998:33-34) maintain that debriefing refers to getting the opportunity after the research to communicate the results with the participants in order to minimize misunderstanding, top work through the participants' experience and to provide a learning experience for both the participants and the researcher. In this research the researcher will conduct debriefing sessions after the research for the participants expressed interest in the findings.

3.5.5. Approval for conducting research.

Permission to conduct research from schools and SEEC was applied and granted by the Limpopo Education Department (refer to appendix I)

3.5.6. Provisions of trustworthiness.

Trustworthiness according to Shongwe, (1996:63) refers to how the gathered information is to be confirmed as true, applicable, consistent and not manipulated by the researcher. Trustworthiness is seen by Petersen, (1999:22) as examining the extent to which others can have confidence in the outcomes or findings of the study. Trustworthiness in this research was attained through ensuring the following criteria for trustworthiness, validity, reliability, credibility, applicability, consistency and neutrality.

3.5.6.1. Validity.

Validity according to Schumacher & MacMillan, (1993:391) refers to the degree to which the interpretations and concepts have mutual meanings between the participants and the researcher.

In order to increase the validity of the research, the researcher carefully evaluated both official and private documents as that according to Searman, (1987:187) increases validity. Validity was also achieved through using more official documents than private ones and evaluating them, interview transcript being more

of quoted phrases from interviewee's speech, using triangulation of data collection techniques (Schumacher & MacMillan. 1993:392, Petersen, 1999:24, De Vos et al, 2002:275) and piloting the questionnaire (Shongwe, 1996:58).

3.5.6.2. Reliability.

Reliability under qualitative research refers to the dependability of the results and the consistency of the research results with data collected (Schumacher & MacMillan, 1993:385, Meriam in Petersen, 1999:23).

Reliability for this research was achieved through deriving participants' meanings from conversations, transcripts and direct quotations. Tape recording the participants' response and making the interview transcripts available to participants in order to check any misrepresentations was done as that increases reliability (Schumacher & MacMillan, 1993:385).

Piloting the research through interviewing other informants in the same role and involved with the event (where in this instance other EOs) from Letaba EEC also helped in enhancing reliability (De Vos et al, 2002:324).

3.5.6.3. Credibility.

Credibility refers to determining how confident the researcher is with the truth that the subjects, research design, context and findings were accurately identified and described (Shongwe, 1996:63, De Vos et al, 2002:351).

The research is credible because it took three years to do it with one-year preparation including also a pilot study. Member check by participants (Shongwe, 1996:64, Petersen, 1999:24) was done in order to enhance credibility. From data collected using the three methods, there was congruency and that according to Shongwe, (1996:64) enhances credibility.

3.5.6.4. Applicability.

Applicability is defined by Krefting in Shongwe (1996:64) as the degree to which the research findings could be applied to other groups, contexts and settings. Although qualitative research does not aim at generalizing its findings (for they don't take a studied case as a probable sample) it aims at extending the understanding of the studied problems to similar situations (Schumacher & MacMillan, 1993:394).

The use of descriptive survey where comparison between what questionnaire, interview and document study found according to Shongwe, (1996:65) enhances applicability. Applicability was further enhanced through using verbatim quotations from what participants said. Further enhancement of applicability was realized through triangulation of techniques and sources where different groups of sources were used as participants i.e. teachers and EOs (De Vos et al (2002:352).

3.5.6.5. Consistency.

This according to Shongwe (1996:65) Lincoln and Guba in De Vos et al, (2002:352) refers to consistency as whether the findings of the research could be

the same if another research is done with the same subjects or in a similar context. Because qualitative research could not guarantee that, for people are not static in behaviour and thoughts, they tend to determine if the data could help confirm the general findings and lead to the implications (Shongwe, 1996:65 and De Vos et al, 2002:352). The uniqueness of the human situation and consistency could be defined in terms of dependability.

Consistency was enhanced in this research because it dealt with a range of experiences i.e. those of teachers and those of EOs.

3.6. Conclusions.

The researcher concluded that the research topic could be researched better through using qualitative research design. In order to get quality information it was noticed that a case study design where only one EEC (Schoemansdal) is to be studied and information from it verified or nullified by inputs from teachers. Research techniques as dictated by the research topic and design as those that would bear the best results included questionnaires to be completed by teachers, interviewing one environmental officer from SEEC and a document analysis of all documents related to environmental awareness development and their statistical data thereof.

CHAPTER 4

SUMMARY OF FINDINGS, ANALYSIS, TESTING THE HYPOTHESIS AND RECCOMMENDATIONS.

4.1. Introduction.

This chapter is concerned with data analysis of the data collected. The chapter starts with presentation of data gathered from a questionnaire survey together with findings from it. An elaboration and analysis of data from documentation will follow data from questionnaire. Data from the interview will conclude the section on data collected and analyzed.

A summary of findings emanating from the analysis of data from questionnaires, documentation and interview will form the next section. Such findings will help us in testing the research's hypothesis as either being true or not and that will be followed by recommendations directed towards SEEC and Limpopo Education Department, which will conclude the chapter.

4.2. Presentation and analysis of the research findings.

The following are the findings from the research about the role of Schoemansdal EEC in creating environmental awareness in its neighbouring schools.

4.2.1. Data from questionnaires.

The following data emanate from information gathered by means of a questionnaire survey.

4.2.1.l. Biographical information.

Data from questionnaires was collected from thirteen schools as indicated in the following table:

Participants	Sex		Total
	Males	Females	
Educators from primary level	3	5	8
Educators from secondary level	3	2	5
Educators who are environmental coordinators in their schools	3	2	5
Educators teaching environmentally related subjects and learning areas e.g. Geography, Biology, Agricultural Science, Life Sciences, HSS etc.	3	4	7
Educators who are not teaching environmentally related subjects.	2	4	6

4.2.1.2. Categorising data from questionnaires.

Data from questionnaires was categorized into the following categories:

A: Knowledge about the existence of the centre.

- hearing about the existence of the centre.
- Reading about it
- Knowledge from EOs.

B: Contact between centre and schools.

- Correspondence from the EEC to schools.
- School visits by EOs and their aim.
- EEC visits by schools and aim.

C: Knowledge about the EEC's role.

- primary roles of EECs
- supporting roles of EECs.

4.2.1.3. Findings from questionnaires.

The following are the findings from the questionnaire survey:

A: Knowledge about the existence of the centre.

Response from all the respondents showed that they all know about the existence of Schoemansdal EEC although the knowledge was gained either formally or informally.

(i) Informal knowledge.

Informal knowledge is knowledge gained without following fixed rules or customs (Guralnik, 1971:386). Knowledge gained informally in this research ranged from participants knowing about the existence of the centre from relatives working at the centre, colleagues at work to knowing it from directional road signs showing where it is situated. Out of thirteen participants eight knew of its existence informally.

(ii) Formal knowledge.

Formal knowledge according to Guralnik, (1971:294) is knowledge gained through following fixed customs or rules. Formal knowledge about the existence of the centre in this research included knowing of its existence from advertisement outlining programmes from the centre in the local newspapers and pamphlets distributed to schools and formal address. From the total respondents four read about it from a newspaper, ten read about it from pamphlets sent to their schools outlining the mission and booking details with five having known about it from EOs who visited their schools.

B: Contact between the centre and schools.

Most of the schools showed that within a period of twelve months they have received pamphlets from Schoemansdal EEC inviting them to visit and take part in some of the programmes they are offering. Of the total schools surveyed only four schools didn't receive correspondence during that period.

Ten schools from the total surveyed recorded no visit by an EO within a twelve months period with one school recording only one visit and two recording two visits. The purpose of visit to schools visited was inviting schools to visit the centre where information about what is happening at the centre was shared.

Half of the respondents recorded that they have visited the centre. Most of them (99%) visited for departmental activities rather than for environmental interests. The purpose of visiting included: holding principal's meetings, attending in service training of teachers organized and run by the education department, short listing candidates for promotional posts and going there for learners' motivational talks. Of all the reasons stated above, the centre was only used as a venue and no personnel from the centre took part in any of the activities conducted.

On using the media in order to create contact between the centre and the schools, majority of the respondents (77%) recorded that they have neither heard environmental information presented on local radio stations like 'Phalaphala FM' and 'Univen FM' nor read about it in their local newspapers like 'Mirror' and 'Capricon News' as presented by EOs from Schoemansdal EEC. 67% of the respondents have also not heard or read about any environmental celebrations of any special environmental day from radio stations or in any newspaper. Majority

of the respondents (70%) haven't also seen posters advertising Schoemansdal EEC in their places of interest like shopping centres, sport fields, local shows etc.

C: Knowledge about roles of EECs.

(i) Primary roles of EECs

Primary roles of EECs are awareness creation, attitude change to environmentally inclined one and solving of environmental problems in, through and for the environment (Yeld in Shongwe, 1996:157, Bornman, 1997:60).

77% of the respondents agree that the centre has a role to do in relation to creating environmental awareness through updating them with special environmental activities and about locally environmentally occurring problems. 62% of the respondents responded that the centre has encouraged them to phase environmental problems from their area and solve them. 58% disagreed that the centre did change their attitudes towards owning their environment.

(ii) Supporting roles of EECs.

Supporting roles are all other roles, which EECs could do apart from the primary roles. Most of the respondents see the centre as a place of entertainment (77%), a place of syllabi enrichment for environment-related subjects (77%), a place for holding departmental initiated meetings together with getting motivational talks (82%).

4.2.2. Findings on data from documentation.

A thorough document study was done of documents, which have a bearing in environmental awareness creation. From the analysis of documents it was discovered that:

- There were no document, which depicts the position of the centre and its position of intent in relation to environmental awareness creation e.g. organizational rules and regulations, memoranda or committee meetings' minutes.
- Brochures posted to schools advertising programmes, which are conducted at the centre, prices of the programmes together with booking information are available. Such brochures are distributed to visitors and the EO no longer remembered the last time they were posted to schools.
- Awareness creating resources e.g. posters, exhibited material (stuffed animals) together with teaching and learning aids are available. 90% of the tree species have names written on them (both common and scientific name).
- No statistics of schools visited for the past twelve months (Jan-Dec 2005) were available as no school was visited by EOs from then till now with reasons given (refer to findings from interview).
- A computerized statistics of institutions, which visited the centre for the past twenty-four months together with reasons for visiting, was found. Out of forty-three schools in Zoutpansberg West Circuit only two schools (one primary and one secondary) visited the school during the past twelve months (i.e. Jan-Dec 2005). The primary school's purpose of visiting was to conduct farewell function there (i.e. using the premises and facilities of the centre without any involvement of EOs) whereas the secondary school went there three times for the centre's programmes.

- No statistics of post-visit by EOs was available as no visit was made to schools since last year.
- No statistics of awareness campaigns, environmental celebrations and exhibitions are available as none were held, with reasons given by the interviewed EO and the centre's head.
- Books, audio-visual cassettes and audiocassettes are available but for only using within the centre's premises during visitation under the supervision of EOs.
- No statistics of radio recordings and newspaper presentations by EOs from the past twelve months until now was found.

4.2.3. Data from interview and its findings.

One EO was interviewed from Schoemansdal about the role, which the EEC is playing in creating environmental awareness. Notes were taken and response tape-recorded but the sound of the cassette was so poor such that it was not audible even with the speaker of the recorder placed next to an ear. As a result of that, analysis will be based on the notes taken during the interview and what the researcher still remembers as being said by the EO.

4.2.3.1. Categorizing data from the interview.

Categorizing data, according to DeVos et al, (1998:343) refers to the clustering or grouping of similar topics or concepts. According to De Vos et al, (2002:339) data analysis is making sense of the data that has been collected. Data analysis consists of the following eight steps, which are referred to as Tesch's approach to data analysis (Creswell in De Vos et al, 2002:61):

- Reading through all transcripts carefully and get a sense of the whole.

- Selecting one participant's response to find underlying meanings and thought of that interview. Thoughts that come up are written in the margin. Continuing with step 2 for several participants and listing all the topics.
- Clustering similar topics together.
- Taking the list and returning to the data and then finding out emerging categories.
- Reducing categories by grouping related topics that show interrelationships.
- each category is coded and arranged accordingly.
- Assembling data material belonging together into one place and beginning with preliminary analysis.
- Existing data is recorded if necessary.

In this research Tesch's data analysis steps were used but adapted to the following three:

Step 1: Reading.

In this first step the transcript was read very carefully. Participant's response was read and analysed to find the underlying meaning and thought.

Step 2: Categorising the data.

After reading through the response's summary similar topics from response were clustered together. These similar topics or responses were organized into categories.

Step 3: Development of theories.

According to Schumacher & MacMillan, (1993:7) as well as De Vos et al, (1998:345) a theory is a general explanation, conclusion, making inferences, building linkages or attaching significance to the research findings. In this research, relationships between major and subcategories were identified and from the research results theories or implications emerged.

The following categories emerged from response from the interview:

A: Contact between centre and schools.

- Lack of school visits.
- Minimal posting of brochures containing offered programmes.
- Lack of newsletter, magazines or journal.
- Lack of coordinating structures between schools and the centre.
- Effective feedback.

B: Roles of EECs

- Lack of carrying out EECs primary roles.
- Underperformance of EECs secondary roles.

C: Resource development and availability.

- Lack of access to resources and use of centre as a resource.
- Lack of teachers' involvement in resources' development.

- Lack of resources exhibition.

4.2.3.2. Findings from the interview.

The following are the findings from the interview survey.

A: Contact between schools and the centre.

According to Jacobson et al (1997:34) and Burge, (2003:107) school visits by EOs is of importance because it is time when school visits talks, EE materials supply and clarification could be done. Environmentally related assistance in the form of project initiation and helping with EE programmes for both pupils and teachers could be organized. Although school visits are weighted that much, from the response of the EO supported by that of the centre's principal no school visits was conducted since January 2005. The reason cited for not conducting school visits anymore is lack of funds, manpower and transport, which the department of education has stopped to subsidize. In this regard the EO said: "How do you expect the centre to go to schools with no car available and with only two EOs going to so many schools?"

The EO no longer remembers as to when last did they send brochures outlining programmes they are offering and booking information but he is sure they have sent a small batch to schools during the past twelve months. Because no statistics of brochures sent was found, it could not be ascertained as to whether any of the schools in Zoutpansberg West Circuit received such brochures.

According to Kanyimba, (2002:74) awareness could be created faster if EECs have their own newsletters, journals or magazines where they will write more about environmental issues rather than relying on slots found from other magazines where they end up reporting less issue. Schoemansdal EEC does not have any magazine, newsletter or journal because as a departmental EEC no grant was received from the department for producing their own newsletter. When interviewed about that the EO said: “No money no magazine, for to keep it running you need money.”

Initiation and formation of EE coordinating structures, which could help in raising awareness and solving environmental problems, is another role, which EECs should perform (Wangari Mathaai in City Press, 2004:8). From Schoemansdal EEC, no structure is in place for coordinating between schools and the centre as they no longer go out to schools because of lack of funds and manpower.

Feedback about the relevancy of programmes they offer is carried out on regular basis where in this regard the EO said: “For any group visiting the centre, we request feedback on continuous basis (i.e. throughout the programme). Feedback is in the following forms:

- Continuous evaluation of the programmes by their visitors, which included the then MEC for Education in Limpopo Provincial Government Honourable Joyce Mashamba. In this regard the EO said: “They (Mashamba and her administrative staff) came and left here singing us praises about the work we are doing.”
- Attending educational workshops conducted by the education department about curriculum so that they be relevant in what is being offered in schools and requested by the syllabi.
- Schools, which complete evaluation questionnaires and some leaving their school badges as a token of appreciation and alliance with the EEC as being proud of the centre.

B: EECs' roles.

According to Oberholzer (1988:26) and Macrae (1990:111), EECs' primary roles are to provide specialist environmental encounter between pupils and the environment through portraying them as part of the environment, which cannot be separated from the environment.

That is realized through creating environmental awareness, pioneering pupils attitude change towards the benefits of the environment and initiate, portray and involve pupils in solving local environmental problems. All of these could be realized when there is continuous interaction between the centre and the schools (Opie & Shcuil, 1993:23, Yeld in Shongwe, 1996:157). The centre up to so far is doing minimally in that as they do not go out to schools where they are supposed to do such things but, wait for them to come which they are not doing as only two schools visited the centre from those sampled since January 2005.

Secondary roles of EECs range from conducting teachers training and workshops (in- and pre-service) (Shongwe, 1996:156), being centre of leadership and motivational talks (Riley, 1985:37) and a centre for further studying (Burge, 2003:71). In as far as in-service training of teachers so that they become environmentally inclined in their teaching is concerned, the centre is doing nothing claiming that it does not have funds. In this regard the EO said: "The department is not cooperating in this regard for it does not allocate us funds and manpower to do that." Because the centre has been relegated to the state of an educational multipurpose centre (EMPC) rather than an organ of state (refer to chapter one) where only educational staff is remunerated by the department, they are now more

focused on motivational and leadership training in order to continue surviving. The EO on this regard said: “You see, its frustrating. We have non-teaching staff, which we have to pay from our own coffers. We cannot go out to schools because of lack of funds then we have to attract pupils by doing what is relevant to them to let them come. We rely on funds from our facilities from which we have to pay our employees and services.”

EE programmes, which they treat, are those requested by schools wherein they have to introduce the environment through those topics and treat the topic from an environmental perspective. The centre is also used as a venue for holding departmental meetings, farewell functions and practical (mostly by university students with their lectures). From the above-mentioned situations the centre gets funds from catering and accommodation, as they do not allow visitors to bring along their own food.

C: Resources development and availability.

EECs are there in order to produce materials in collaboration with teachers as the actual practitioners who are going to use them, make them known to schools and give access for schools to use them (Jacobson & Padua, 1992:292, Irwin, 1993:107, Burge, 2003:51). According to the EO they have plenty of materials in the form of posters (some displayed in the hall), booklets outlining their programmes from which one chooses the programme, tools and equipments for carrying out EE practical and an exhibition stand outlining the scenery and programmes at the centre. Schools do not have access to the centre’s resources unless it visits the centre, as they are not loaned to schools. Because schools are not visiting, such materials are not available to them and they do not know about

them. In this regard the EO said: “We have plenty of resources material, some we developed ourselves like booklets whereas some like posters we get from The Department Of Environmental Affairs, but only of use during visitation. Exhibitions of such materials is not done except in the launching of EMPCs where they took their stand and displayed it there and colleagues from other EMPCs were attracted by the scenery of the place and programmes. The EO in this regard said: “We took our exhibition stand to Tivumbeni during the launching of the EMPCs. Colleagues from other EMPCs were amazed of our centre and said, Woo! Where is this place, seeking details of the centre.” Environmental tools for practical e.g. tents for camping, binoculars, water turgidity testers, nets etc are available but, could only be used during visits to the centre under the supervision of the EOs.

4.3. Implications of research findings.

Unless SEEC starts to visit schools with an aim of creating environmental awareness, the schools in Zoutpansberg West Circuit shall only know of the existence of the centre (as have been shown) but continue to be environmentally unaware. The visiting of schools by EEC is not only the responsibility of the EEC alone but, the Limpopo Department Of Education should fund such school visits as SEEC is a departmental EEC.

The EEC should change its priority list and activities by doing more of its primary roles and less of its secondary roles (as stated in section 4.2.3.2) and motivate visitors to come for primary roles than for secondary roles. That calls for funding which the department has to offer so that the EEC does not have to continue with doing secondary roles more because they finance them and keep them going.

The centre needs to increase its use of local mass media i.e. radio and newspaper in order to reach audience in places where they are failing to reach physically because of lack of funds and time. Going hand in hand with the use of mass media, the centre needs to organize environmental exhibitions, and celebrations in areas of interest like sport fields and shopping centres. Another thing to be considered could be making access to environmental resources easy for teachers and pupils either as groups or as individuals for both professional and private use to an extent of loaning them and use them away from the centre.

Because empirical research was conducted in only fourteen schools from one circuit, further research in more schools might shed some light on Schoemansdal's role in creating environmental awareness.

4.4. Hypothesis testing.

From the research it was noted that SEEC has neglected its primary roles (refer to section 4.2.3.2 b) and chose only those secondary roles, which keep it in existence. As a result of that the hypothesis stands that SEEC is not playing a role in the development of environmental awareness in its neighbouring schools.

4.5. Recommendations.

In view of the above findings based on the research, the researcher recommends the following:

* That Schoemansdal EEC change its priority list and consider doing more of its primary roles i.e. environmental awareness development and help neighbouring schools with developing environmentally acceptable behaviour than acting as a leadership training centre.
* That the Limpopo department of education allocate funds to SEEC as it is a departmental EEC such that it continues with its environmental roles than becoming an EMPC offering syllabi enrichment and motivational talks.
* SEEC should do more in the awareness creation field through: visiting schools, advertising their activities in local mass media's, involving teachers in resource development and be accessible by individuals and groups.

4.6. Conclusions.

In view of what has been stated above it becomes clear that SEEC intends to do environmental awareness from inside without going out visiting schools. The centre also is concentrating much on its secondary roles than on its primary roles by neglecting awareness creation while conducting motivational and leadership talks. More schools recorded as visiting the centre are going there for other reasons apart from environmental reasons like doing departmental duties (i.e. workshops, attending meetings, short listing interview candidates), going there for motivational and leadership talks and using the centre as a place of entertainment

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Ratshili. 19/04/2006. Interviewed at Schoemansdal EEC

Jordan. 19/04/2006. Interviewed at Schoemansdal EEC

ANNEXURE A

P.O. Box 232
Tshaulu
0987
07/02//06

The Head of the Department
Department of Education (Limpopo)
Research and Planning Directorate
P/Bag X9489
Polokwane
0700

Dear Sir or Madam:

PERMISSION TO CONDUCT AN INTERVIEW SURVEY WITH AN ENVIRONMENTAL OFFICER FROM SCHOEMANSDAL ENVIRONMETAL EDUCATION CENTRE IN PARTIAL FULFILMENT OF A MASTER'S DEGREE IN EDUCATION.

I, the undersigned, Humbulani David Mudzunga, am a registered student at UNISA, in the Faculty of Education. I am currently enrolled in a master's degree in Environmental Education under the supervision of Doctor Lebeloane L.D.M.

In partial fulfillment of this degree, I will have to complete a research essay in which I wish to focus on the area of environmental awareness development by environmental education centres in schools neighbouring environmental education centers. My supervisor and I feel that a study of this nature may in a small way

contribute towards the growing pool of South African research on environmental awareness development in schools by environmental education centers.

The study I am to undertake in the coming months will be by means of an interview schedule where one environmental officer from Schoemansdal Environmental Education center will be interviewed together with a document analysis of environmental awareness development documents. I should therefore like to procure your permission for this study to be conducted with one environmental officer and some relevant documents analyzed from the center.

It is our view that knowledge gleaned from this study could furthermore be utilized in staff development activities within both environmental education centers and schools, specifically around the issue of environmental awareness development.

I look forward to hearing from you at your earliest convenience.

Thanking you in anticipation.

Yours faithfully
Mudzunga H. D.

ANNEXURE B

P.O. Box 232
Tshaulu
0987
07/02//06

The Head of the Department
Department of Education (Limpopo)
Research and Planning Directorate
P/Bag X9489
Polokwane
0700

Dear Sir or Madam:

PERMISSION TO CONDUCT A QUESTIONNAIRE SURVEY WITH SCHOOLS IN ZOUTPANSBERG WEST CIRCUIT IN PARTIAL FULFILMENT OF A MASTER'S DEGREE IN EDUCATION.

I, the undersigned, Humbulani David Mudzunga, am a registered student at UNISA, in the Faculty of Education. I am currently enrolled in a master's degree in Environmental Education under the supervision of Doctor Lebeloane L.D.M.

In partial fulfillment of this degree, I will have to complete a research essay in which I wish to focus on the area of environmental awareness development by environmental education centres in schools neighbouring environmental education centers. My supervisor and I feel that a study of this nature may in a small way contribute towards the growing pool of South African research on environmental awareness development in schools by environmental education centers.

The study I am to undertake in the coming months will be by means of a questionnaire survey where one teacher from each of the sampled schools shall complete a questionnaire. Attached find the list of schools sampled from all schools at Zoutpansberg West Circuit. I should therefore like to procure your permission for this study to be conducted with one teacher from each of the sampled schools.

It is our view that knowledge gleaned from this study could furthermore be utilized in staff development activities within both environmental education centers and schools, specifically around the issue of environmental awareness development.

I look forward to hearing from you at your earliest convenience.

Thanking you in anticipation.

Yours faithfully

Mudzunga H.D.

ANNEXURE C

Date:…….

I, the undersigned, Ms/Mrs/Mr…… (Please print full name) hereby grant consent to Mudzunga H.D., student from Unisa, to conduct interview with me for his research in partial fulfillment of his master's degree.

……..

Signature of participant.

ANNEXURE D

LIST OF SAMPLED SCHOOLS FROM ZOUTPANSBERG WEST CIRCUIT.

A: PRIMARY SCHOOLS

1. Funyu-funyu
2. Gogobole
3. Madabani
4. Madodonga
5. Manavhela
6. Mmbabada
7. Muengedzi
8. Mugororwane
9. Mukhudwane
10. Muraleni
11. Tshiozwi
12. Vhulorwa

B: SECONDARY SCHOOLS

1. Luvhivhini
2. Nnzwobi
3. Swongozwi
4. Thokampe
5. Tshiungulela

APPENDIX E

P.O. Box 232
Tshaulu
0987
08-03-06

Dear Participant

I, the undersigned, Humbulani David Mudzunga, am a registered student at UNISA, in the Faculty of Education. I am currently enrolled in a Masters Degree in Environmental Education under the supervision of Doctor LDM Lebeloane.

In partial fulfillment of this degree I will have to complete a research essay in which I wish to focus on the area of environmental awareness development in schools neighbouring environmental education centers. My supervisor and I feel that a study of this nature may in a small way contribute towards the growing pool of South African research on environmental awareness development.

You as a teacher are requested to complete the questionnaire about Schoemansdal Environmental Education Center. Your contribution will be highly appreciated and used towards benefiting research in South Africa.

Thanking you in anticipation.

Yours faithfully
Mudzunga H.D.

ANNEXURE F

LIST OF SCHOOLS IN ZOUTPANDBERG WEST CIRCUIT

PRIMARY

1. Boerlands
2. Funyu-funyu
3. Gogobole
4. Khogonyane
5. Klipput
6. Madabani
7. Madaheni
8. Madodonga
9. Maebani
10. Magovhani
11. Maguluvhe
12. Manavhela
13. Mara primary
14. Mara buys
15. Marua
16. Masete
17. Matitivhala
18. Mmbabada
19. Mmberegeni
20. Muduluni
21. Muengedzi
22. Mugororwane
23. Mukhudwana
24. Munau

25. Muraleni
26. Mungadi
27. Pharani
28. Ramahantsha
29. Tshiozwi
30. Vhulorwa
31. Stephanus

Secondary

1. Kutama
2. Luvhivhini
3. Magoni
4. Maneledzi
5. Mmilige
6. Nnzwobi
7. Sinthumule
8. Swobani
9. Swongozwi
10. Thokamphe
11. Tshirululuni
12. Tshiungulela

ANNEXURE G

1. **BIOGRAPHICAL INFORMATION**

A: In which school level do you teach?

1: Primary ☐ 2. Secondary. ☐.

B: Sex 1.Male ☐ 2.Femal. ☐.

C: Which of the following subjects do you teach?

1. Biology/Life Science. ☐. 2: Geography/ Human and Social Sciences. ☐.

3: None of them. ☐.

D: Are you an environmental coordinator in your school?

1: YES. ☐. 2: NO. ☐.

II ENVIRONMENTAL INTERACTION BETWEEN YOUR SCHOOL AND SCHOEMANSDAL ENVIRONMENTAL EDUCATION CENTRE.

A: Have you heard about Schoemansdal Environmental Education Centre?

1. YES. ☐. 2: NO. ☐.

B: How did you come to know about the existence of the center? Choose as many options as possible:

1.I have read about it from a newspaper. ☐.

2. I have received a pamphlet from the center which awakened me of its existence. ☐.
3. Environmental officers from the center came and let us know of the centre's existence. ☐
4. I have only seen it shown by directional road signs showing where it is situated. ☐.
5. Other ways apart from all the above mentioned.

   Specify……

……

……

C: How many times in a period of twelve months, has your school received correspondence from the center?

1. No correspondence. ☐ 2. Only once. ☐

3. More than once but less than four ☐ 4. More than four. ☐

D: What was the aim of the correspondence? Cross as many options as you deem fit:

1. Inviting your school to visit the center. ☐
2. Inviting tour school to an environmental celebration. ☐
3. Sharing environmental-related information about a specific EE issue. ☐
4. Outlining programmes which are being offered by the center. ☐
5. Any other reason.

   Specify……

   ……

   ……

E: After receiving the correspondence, did you visit the EE center?

1. YES. ☐ 2. NO. ☐

If you answered NO above skip F, G and H but, if you answered YES above skip I.

F: What form of visit was it? Cross as many options as possible:

1. Individual visit ☐ 2. School day outing. ☐ 3. School accommodated visit ☐

4. Teacher in-service workshops run by the center. ☐

5. Teacher in-service workshop run by the Education Department. ☐

6. Other. Specify……..

I: What motivated you not to visit the center?

……

…….

J: How many times in a period of twelve months have environmental officers visited your school?

1. No visit. ☐ 2. Only once. ☐ 3. More than once but less than four ☐

4. More than four. ☐.

K: What was the purpose of the visit?

……

……

……

L: In each of the following statements make a cross underneath the scale which best describes what you are, what you know or how you feel:

	Always	frequently	seldom	Never
I have heard environmental information in our local radio stations (i.e Phalaphala FM, Univen FM) as presented by environmental officers from Schoemansdal EEC				
I have read environmental information in our local newspaper (i.e Mirror, Capricon News) as written by environmental officers from Schoemansdal EEC				
I have heard environmental celebrations of special environmental days advertised in our local radio stations by the center				
I have seen environmental celebrations of special environmental days advertised in our local newspapers by the center				
I have seen posters advertising Schoemansdal EEC at our place of interest e.g. shopping centers, sport fields				
I have seen posters advertising Schoemansdal EEC during special events which attract more people (e.g. shows, matches, road shows, regional and provincial celebrations and competitions)				

M: Beside each of the statements listed below, please indicate whether you strongly agree, agree, disagree, strongly disagree or do not know in relation to information about Schoemansdal Environmental Education Centre.

	Strongly agree	agree	disagree	Strongly disagree	Do not know
The center is a place of entertainment outing					
The center is a place of learning					
The center helps us with environmental issues update like special environmental days etc					
The center helps us with our school syllabi enrichment					
The center enhances our personal growth by offering us learning opportunities					
The center has changed our attitude towards that of owning our environment					
The center has made us aware of locally occurring environmental problems					
The center has encouraged us to phase environmental problems and solve them					

ANNEXURE H

Interview schedule.

The interview schedule is derived from the overall theme and topics to be covered by the interview. The research's interview schedule is based on the following themes: communication between the center and the schools, resource material development and supply, training offered by the center and the involvement of schools in solving local environmental problems. The interview was conducted with one environmental officer trying to get his perception about what role is SEEC is performing in relation to the creation of environmental awareness and whether they are doing enough or not. The interview was conducted in English. Underneath follows the interview guide of this research:

A: EECs should become places where people meet to seek clarity on environmental issues, where ideas and tools for environmental problems are made available to those who need them most.
What form of structure has your EEC put in place in order to attract schools (teachers and pupils), reduce alienation of people from institutions and use it in seeking clarity about environmental issues?
What do you do in order to create enthusiasm to both teachers and learners who visit your center in order to take environmentally accepted action in whatever they do when they go back home?
What part is your center playing in empowering the above-mentioned structures and schools in order to act on environmental issues and promote environmental ethics?

B: It is the attitude of the children that will contribute to a change in attitude of parents.

What activities from your awareness development package, are aimed at changing pupils' attitudes for the benefit of the environment?
How do you make use of these activities in order to achieve attitude change?

C: Environmental awareness is the primary role of any EEC while subject-related topics treatment is expected by most of the teachers in order to understand such topics.
How do you organize your visits such that you reconcile the two i.e. achieve environmental awareness while helping teachers with syllabus-related topics?

D: Newly qualified teachers are viewed by centers as agents of change when they ultimately resume teaching responsibilities in schools.
During which occasions do you target newly qualified teachers?
In what ways do you encourage such teachers to contribute towards improving the quality of the environment?

E: Materials could be used in creating awareness and transmitting messages because they contain prominent messages, which could respond to the so-called environmental crisis.
Which materials have you developed with an aim of creating awareness and transmitting awareness messages?
Which environmental tools are made available to schools, which could be used in solving environmental problems?

F: The principle of resource material development is that the actual practitioners have to be involved from the initial stage of material development until the actual use of the said resource.
How do you involve teachers in the development of resource material, as they are the actual practitioners of these developed materials?

G: In order to achieve up to date teaching and learning, supportive materials require good and continual upgrading and improvement.
How do you upgrade and evaluate your support materials?
What types of exhibitions are displayed in your center in order to consietize teachers and learners about the state of the environment?
How do you make use of these exhibitions in making sure that visitors to your center become environmentally conscious?
H: The in-service education of teachers by EECs is an excellent example of how the gap between the center and education could be bridged.
How often do you conduct teacher in-service education training?
How do you use them in bridging the gap between your center and education?
What role does your center play in helping teachers develop themselves and increase their academic as well as professional knowledge?

I: As other centers have their own magazines covering activities done at their centers e.g. “Delta Talk” from Delta EEC, do you have yours?
If not, which mass media do you make use of in order to make neighbouring schools aware of environmental activities that you’re doing which they can take part in?
J: There is a need to continually evaluate programmes in order to determine their suitability.
How do you evaluate your awareness creating programmes in order to see if they are still suitable or not?
After how long do you evaluate them?
Who evaluates them?

Probing and clarifying questions will be posed when:
Answers are not clear.

When I need an example to illustrate what the participant was saying.

When I want more information about the participant's feelings, motivations, actions, reactions and anticipations.

ANNEXURE I

Limpopo
PROVINCIAL GOVERNMENT

Enquiries: Mokoka M B
Telephone: 015 290 7918

TO WHOM IT MAY CONCERN

Sir/Madam

The bearer, Muzunga H D, has been given permission by Limpopo Department of Education (LDoE) to conduct research at schools in Zoutpansberg West Circuit in Vhembe District. The research topic is: The role of Schoemansdal Environmental Education Center in the creation of environmental awareness in its neighbouring schools.'

The Department requests departmental officials, learners, managers and educators to cooperate with the researcher when research activities are conducted.

It is envisaged that the research report will assist LDoE in many ways.

Thank you

---------- DATE: 03/03/06
HEAD OF DEPARTMENT

DEPARTMENT OF EDUCATION
HEAD OFFICE