The provision of environmental education towards sustainability with reference to the Inner City Enviro Centre in Tshwane.

(Dissertation of limited scope)

by

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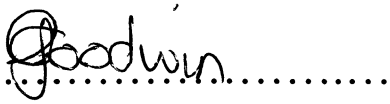
I, CARY GOODWIN, declare that "The provision of environmental education towards sustainability with reference to the Inner City Enviro Centre in Tshwane" is my own work and that all the sources that I have cited have been indicated and acknowledged by means of complete references.



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Abbreviations

ANC - African National Congress

DANCED – Danish Cooperation for Environment and Development

DACEM - Department of Agriculture, Conservation and Environment

DEAT - EASY - Environmental Award System for Youth

EE – Environmental Education

EECI - Environmental Education Curriculum Initiative

GPMC -Greater Pretoria Metropolitan Council

ICEC – Inner City Enviro Centre

IUCN - International Union for the Conservation of Nature and Natural Resources

NEEP – National Environmental Education Project

LEEF - Local Environmental Education Forum

NGO - Non-governmental organization

PICP – Pretoria Inner City Partners

SACTE - South African College of Teacher Education

TMC -Tshwane Metropolitan Council

UN - United Nations

UNCED – United Nations Conference on Environment and Development

UNEP – United Nations Environment Programme

UNESCO – United Nations Educational, Scientific and Cultural Organisation

Unisa - University of South Africa

USA – United States of America

WESSA - Wildlife and Environment Society of South Africa

Summary

The provision of environmental education towards sustainability with reference to the Inner City Enviro Centre in Tshwane is a comprehensive research project that describes the establishment and development of the Inner City Environmental Centre over a six-year period.

This research focuses on the informal education sector and the methods used by centres, both locally and internationally to provide environmental education and / or education for sustainability.

The Inner City Enviro Centre is used as a case study. The development of the ICEC is investigated in terms of the objectives it was to fulfil. The achievements and difficulties that the ICEC experienced are examined. This was done using document analysis and by interviewing those involved. This information was then assimilated and helped the researcher to make informed, objective judgements concerning the ICEC. Educators working on a project with the ICEC were given questionnaires which asked questions relating to environmental education and excursions. The data collected from findings is used to provide guidelines for future development of the ICEC and for others who might want to embark on similar projects.

Key terms:

Environmental education; education for sustainability; provision of information; environmental centres; education centres; sustainable development; inner city and urban environment.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

"The environment is life, supporting people and other living things...it is widely recognized as the 'pillar' of sustainable development. It provides essential goods and services which contribute to meeting basic human needs, and is essential to human development and quality of life" (Bird, Chenje and Medina, 2002:270) If the environment is life, as Chenje *et al.* propose, then is it so challenging for humans to care for it?

Environmental education and sustainable development are key concepts in our world today. This terminology is taught in many schools either as part of the curriculum in subjects such as life orientation, natural science, human and social sciences or as part of school related projects, such as "Landcare in the classroom" (Kowanko, 1998:4), the National Environmental Education & Training Foundation Education and Environment (K-12) programmes (USA), Eco-schools (Africa) and the National Environmental Education Project (South Africa.)

Businesses, governments, institutions and other sectors are also familiar with the terms – environmental education and sustainable development – the result being that they have been discussed at many conferences, business meetings and brain storming sessions (Belgrade Charter - 1975, Tbilisi Principles – 1977, The Brundtland Report – 1987, Agenda 21 – 1992 and Millennium Development Goals – 2000). These discussions have resulted in strategies, laws, policies and action plans being formulated using environmental education and/or sustainable development as a point of departure. With all the "words" in place, it is time for action (Wallström, 2002:148).

"Le fase La Rena" is a community forum that acted as a facilitator for role players and projects involved in environmental education in Pretoria and further afield (Vogler, 1997, pers com). The members, all keen and active environmental educationists, saw

an opportunity to embrace Agenda 21 and put into practice some of its ideas. Agenda 21 is the "principal global plan to confront and overcome the economic and ecological problems of the late 20th century." It was adopted by 98% of the Earth's nations at the Earth Summit in Rio de Janeiro in 1992 (Sitarz, 1994).

Le fase La Rena created a partnership with Museum Park and together approached the Pretoria Inner City Partnership for funding. Once this was obtained, the partners divided the tasks that needed to be done and established the Inner City Enviro Centre. It was developed to be an example of a sustainable house, a so-called 'green' house. The original idea was to teach children about different aspects of environmental education and sustainable living practices (Inner City Enviro Centre, 1998:1). The ICEC was situated on the Corner of Bosman and Visagie streets in Pretoria (now Tshwane Metropolitan Area) within the Museum Park corridor. It is close to schools, major transport routes and thus ideally situated to be used, not only by learners, but also by the local community, businesses and tourists.

Two years after its inception and despite all efforts made, the ICEC was not financially sustainable. It then broadened its scope to include more tourism related activities, but the ICEC was still dependent on financial assistance from donors and sponsors.

The ICEC has now been established for six years. It has undergone some major changes, including a change in location, expansion of focus and change in partners. It is still reaching those in need of environmental assistance and promotes tourism especially within the inner city but the question is for how much longer could it survive and what needs to be done to make it a thriving success?

The researcher has been involved in certain projects with the ICEC and considers the Centre a resource for educators and the community, but realises that it is being under-utilised. The ICEC has potential and needs to find its niche within the City of Tshwane and the education system. This research is aimed to be of benefit to the Inner City Enviro Centre and environmental centres similar to it.

1.2 Aim of the study

The aim of this study is to explore the development of the ICEC using it's own objectives as described in the business as a foundation. The researcher investigated the strategies used to provide environmental education by the ICEC, the original ideas it had to promote sustainable living and to ascertain which projects worked and why, and examine why some did not succeed.

A further aim of the study is to compile guidelines for developers of other environmental centres. These guidelines are based on the findings from the literature review and the experiences at the ICEC. This research can be used as a reference point for others who can learn from the strengths of those centres that are successful and from the mistakes made.

1.3 Research Design

1.3.1 Literature review

The literature review discusses the various relevant concepts, namely "environmental education", "sustainability," "provision" (in terms of education) and "urban environment". These terms are important in defining the goals of the ICEC as well as being able to compare these to those of other inner city environmental centres. There are numerous environmental centres around the world, varying from outdoor education centres, education centres within national parks or private reserves, marine reserves, community centres, centres within school grounds and educational areas within city centres. In the literature review, examples of these will be investigated to form an overview of the strategies and approaches used to address sustainability and the success or failure of the various centres in achieving their goals.

1.3.2 Case study – The Inner City Enviro Centre

The ICEC has been chosen as a case study as it was one of the first environmental centres to be established in a city centre within South Africa and more specifically the Tshwane Metropolitan Area. It has been operational since 1999 yet the question should be asked as to whether it fulfilled the purpose for which it was developed. If it has, it is necessary to determine which objectives were fulfilled and how these were

achieved. If not, it is necessary to identify the obstacles that resulted in its change of purpose.

1.3.3 Research methodology

This dissertation of limited scope qualitatively investigates the effectiveness of the ICEC at achieving its objectives. It explores the effect that it might have had on the local community (schools, government departments, museums and businesses) with regard to environmental education and sustainable development to ensure its own sustainability. The literature review clarified certain terms and investigated other environmental centres that would be used as reference points later in the study. Initially, an informal interview was conducted with those involved in the development of the ICEC. Four years later, a second interview involving the same people was held to ascertain whether opinions or ideas had changed. Educators that were involved in projects with the ICEC were given a structured questionnaire to complete. This questionnaire investigated their needs in terms of environmental education and sustainability and asked their opinion on the success of the ICEC at providing the relevant knowledge and practical experience relating to these topics. Document analysis and observations were the other research methods used to complete and complement the data obtained.

1.4 Overview of the study

Chapter division:

Chapter One: Introduction

Chapter one briefly outlines the background to the research, why this particular study has been undertaken, the relevance thereof and what the researcher intended to investigate. A brief description of the research methodology is provided as well as an outline of the five chapters.

Chapter Two: Literature review

In this chapter, the concepts related to the topic will be discussed. An examination of the education methods is conducted and the terms such as “environmental education”, “sustainability” and “education for sustainability” are defined. The researcher also

investigates a variety of education centres in existence and explores what makes them sustainable or not.

Chapter Three: Research investigation

Chapter three explains why a case study on the ICEC was chosen as a method of interpreting the information collected. The data was collected qualitatively and analysed ensuring that minimum bias occurred. The selection of the participants, both for the interviews and for the questionnaires, is discussed. Besides just evaluating the interviews and the questionnaires, the documents related to the ICEC are researched. The criteria for each of the research methods used will be analysed and the reasons why they were chosen discussed. The results from this chapter will be explored in chapter four.

Chapter Four: Analysis of data and discussion

This chapter seeks to reflect on the information obtained from the literature review and the case study. The positive initiatives and ideas investigated in chapter two are compared to those of the ICEC. The opinions and views of the various participants are debated. This information is contrasted with the end-result.

Chapter Five: Recommendations

In chapter five the emphasis is on the recommendations based on the outcomes of the research. A number of user–friendly and concise guidelines are compiled based on the findings of the literature review and the investigation of the ICEC. From this information, the researcher will draw up a strategy for the development of other environmental centres especially those in the urban environment. The limitations of the study are stated and ideas for future and further research are suggested.

1.5 Conclusion

In concluding, the outline of this research is described and a brief background given. The rationale for the research is presented and the value of the research stressed. In chapter two the terms related to the research are explored. The literature review also

investigates the existence, development and educational methods of environmental centres around the world and in South Africa.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In chapter two the key terms of the topic are defined and discussed. These terms give the background information to the research described in later chapters.

The key words defined in this chapter include:

- provision - it is described in terms of disseminating information to interested parties
- environmental education
- sustainability, sustainable development and education for sustainability
- the urban environment

In this literature review, the researcher has also surveyed a number of environmental education centres. This was done to illustrate the variety of centres providing informal environmental education and examining the strategies they use to fulfil their objectives. The different environmental education centres offer a point of comparison for the assessment of the ICEC. This chapter is the starting point from which the research described in chapter three and reported in chapter four can be evaluated.

2.2 Definition of terms

2.2.1 Provision - Education

Education is defined as "a process of teaching, training and learning, especially in schools and colleges, to improve knowledge and develop skills" (Oxford Advanced Learner's Dictionary, 2003:371). Education is important to each person and a stepping-stone to a better and a sustainable future for all.

These thoughts are confirmed by a variety of different sources. Those at the World Bank believe that "education is central to development." It empowers people, strengthens nations, and is key to the achievement of the "Millennium Development Goals" (World Bank, 2004a:1).

Billings (1994:2) confirmed the above sentiments suggesting that education plays a vital role in preparing the population for the challenges of today and those to come. She was referring to education in the United States, but the sentiments can be applied to all countries. Education, whether it is formal, non-formal or informal is essential to each and every human being. Pigozzi (2003:32) reiterates this and expanded it to include public awareness and training as key processes to assist humans to reach their full potential.

In South Africa, the African National Congress realised the importance of life long learning and suggested that..."education and training should be available to all from cradle to grave" (ANC, 1994:8). Each individual has the right to an education because without it people will not be able to make valuable and informed decisions. Chawla (1999:21-25) confirmed that learning, especially in environmental education, is a life long process. She believes that "it is from childhood, the place where you were born, where you grew up and the natural environment that you experienced as a child, that were the start of the commitment." It is not only what is taught at school but also friends, family, the media etc. that all form part of a person's education.

South Africa has a high percentage of primary school completion (greater than 95% of the relevant age group), but in other countries in Sub-Saharan Africa the percentage is 50% or less (World Bank, 2004b:1). From this statistic one can deduce that at least half of all young South Africans have basic literacy and numeracy skills. These are essential in helping them find a job and provide for themselves and their families. Those without an education have to resort to other means, such as crime, to survive. Education, or lack thereof, is linked to poverty as well as social and environmental degradation.

Education is the key to creating a society that cares for the environment which surrounds it. Whether people realise it or not, the environment provides all the necessities for life, consequently the provision of education is essential.

2.2.2 Environmental Education (EE)

One of the subjects branching from education is environmental education which has numerous meanings. The researcher has chosen to limit the scope of the definitions and only define "environmental education" and "education for sustainability" with regard to development. She also chose definitions which show the interrelatedness of "environmental education" and "education for sustainability."

Stapp (1969:31) wrote: "Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution." This is one of the first formal definitions of environmental education. The International Union for the Conservation of Nature (IUCN) elaborated on this, suggesting that environmental education is not an isolated subject. It is a process that seeks to develop the essential awareness, knowledge, concepts, ethics, values, skills, and commitment, which will encourage people to have an appreciation of the relationship between man, his culture and his biophysical environment. It will provide people with a base from which to formulate their own ideas and become proactive on matters that affect the quality of the environment, thus securing a healthy and properly functioning sustainable environment (IUCN, 1971:11). This is an ideal definition of environmental education and it is one that many environmental education educators accept (Loubser, 1996:11).

The concept of environmental education became more popular especially when society tried to deal with the many environmental crises that were plaguing the world. With the increased awareness, the number of definitions also increased as the "voices needed to be heard" (Irwin, 1990:6). Another renowned definition is that environmental education is "a process aimed at developing a world population that is aware of, and is concerned about, the total environment and its associated problems which has the knowledge, attitudes, skills, motivation and commitment to work individually and

collectively towards solutions of current problems and prevention of new ones" (UNESCO, 1978:49). This is very similar to that of the IUCN. The challenge with these definitions is that they are broad (Tyson, 1994:10). Both are universal definitions that provided a way of living that should be encouraged, rather than something which can be taught. The purpose of environmental education is to make a difference in the lives of students regardless of their background, and to help produce citizens who can live and work productively in increasingly dynamically complex societies and who respect the environment (all aspects of it) in which they live.

Environmental education is part of each of us. "Educationally speaking, environmental education is a holistic approach involving all three domains of human development: the cognitive, the affective and the psychomotor" (Irwin, 1990:3). Thus it should be taught at home, at schools, in the work place and in each community.

The thoughts of Irwin (1990:3) reiterate those of Smyth (1983:123) who feels that an environmental education framework must be capable of catering for all learners, academics and non-academics and it must be both enjoyable and interesting, addressing all kinds of issues. It must be founded in the real world of experience, where skills may be practised and attitudes developed. This is an ideal objective of environmental education and if educators implemented it and learners learnt the skills, changed their attitudes and values and used this knowledge to make decisions, this world would be a better place.

In the school system, environmental learning and literacy do take place, but this is not the only place it should happen. Non-formal areas of education are becoming more and more important. These include the media (newspapers, television, films, etc.), learning centres, museums, industry-education programmes and out-of-school student programmes, to name a few. The formal sector teaches more about the theory, definitions and explanations of phenomena, but in the non-formal areas, students get the opportunity to experience and investigate the phenomena. These are valuable learning resources which are often under-utilized. They provide opportunities for students to explore (Irwin, 1990:3).

The following two definitions would have the same role in society. They both include the interaction between the environment and humans, which is one of the consequential outlooks of environmental education.

"Environmental education addresses the interrelationships between humans and the environment ...it is concerned with values and skills as well as knowledge" (Disinger and Monroe, 1994:4).

Govender (1997:12) states the following: "Environmental education means different things to different people," and she believes that it should be "a means of providing knowledge to young people so that they can use their biophysical environment in a sustainable manner." Unlike the definition by Disinger and Monroe, Govender puts limits on environmental education that might make it easier to teach, but her idea doesn't include the social interaction that is an important aspect of environmental education, nor does it include environmental education as a life long learning process for all. Our environment is not only the "biophysical" surroundings, but it includes the people with whom you share that space. Each individual plays a role and each is part of the environment.

Environmental education as has been shown above, involves more than just the natural environment. The Environmental Education Curriculum Initiative (EECI, 1996:4) proposes another definition, namely that "environmental education is a process through which we might enable ourselves and future generations to respond to environmental issues in ways that might foster change towards sustainable community life in a healthy environment." This definition supplies the true essence of what environmental education should entail. The researcher believes that the acceptance of this definition is increasing and hopes that it becomes one that future educators will use. It is simple and yet includes the social and environmental issues that environmental education is concerned with, but most importantly it states why environmental education is for everyone.

As can be seen, environmental education is a complex concept due to the growing number of "environmental crises" such as global warning, ozone depletion, melting of the polar ice-caps, loss of rainforests, poverty, land degradation, lack of clean water and air pollution. These environmental issues are not easily solved, as they have complicated interacting social, economic and political dimensions. Modern day lifestyles contribute to these problems and to the attitudes that are acquired in the home and school environment. Sense of balance in our values is essential (Duchene, 2006). The sharing and teaching of values such as family, friendship, environmental concern, spirituality, health and materialism should be done uniformly across all cultures and all ages.

The researcher agrees with Le Grange and Reddy (1997:12) when they suggest that environmental education is not neutral, but rather value-based, and for it to be successful the values of society need to be addressed. Environmental education is "intended to be transformative in nature and can serve as an important catalyst for social transformation and reconstruction. Presently in South Africa, transformation, redress, equity and participation are of major importance and environmental education can be an important facilitating vehicle in achieving these aims" (Le Grange and Reddy, 1997:13).

The environment is a concern for everyone, thus politicians and others involved in government and businesses have also created their own definitions and goals on ways to make it "work" for them. The White Paper on Education and Training stipulates that "environmental education, involving an interdisciplinary, integrated and active approach to learning, must be a vital element of all levels and programmes of the education and training system, in order to create environmentally literate and active citizens and ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources" (Department of Education, 1995:22).

The government and educators realised the importance of the environment and hence made it a phase organiser in the development of Curriculum 2005. Curriculum 2005 has since been replaced with the Revised National Curriculum Statements. The

environment and sustainability are supported in the learning outcomes and assessment standards for all learning areas. "We are therefore fortunate in South Africa that policy requirements incorporate the environment so solidly in our new education curriculum" (Ward, 2003:20). In the United States of America, many educators are helping society achieve sustainability by teaching the three "e's"--environment, economics and equity - along with the traditional three "r's" - reading, writing and arithmetic. In so doing, they are fostering awareness of sustainability among individuals, communities, institutions and governments. In coming decades, education for sustainability would have the potential to serve as a tool for building stronger bridges between the classroom and business, and between schools and communities (National Forum on Partnerships Supporting Education about the Environment, 1994). South African educators have the opportunity to incorporate the three "e's" and the three "r's" in their teaching and encourage partnerships between schools, communities and businesses.

In response to the Earth Summit held in Rio de Janeiro, the South African government drew up and initiated policies and developed a "*Local Agenda 21*" in line with the *Agenda 21* principles for sustainability discussed in Rio. *Local Agenda 21* is a regional government initiative supported by the community and includes a great amount of participatory effort from all to establish a comprehensive action strategy for environmental protection, economic prosperity and community wellbeing. *Local Agenda 21* is the integration of planning and action across economic, social and environmental fields (Mearns, 2000:4). The South African Constitution states that "every person shall have the right to an environment which is not detrimental to his/her health or well-being...and to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures..." (S.A. Interim Constitution Section 24, 1994 ex. Sharenet, 1995:5).

It was soon after the dissemination of the constitution that the new environmental management policy was promulgated in the Government Gazette. It states that, "environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably" (Department of Environmental Affairs and Tourism, 1998:10). It is

a progressive and extensive policy based on respect for the principles and themes of environmentalism (a concern for the protection of the environment) and sustainable development. This changes perspectives from those of only conservation and protection of the environment towards its sustainable use. The document puts before the nation and its people the means and criteria for identifying environmental issues that contribute towards our peace, development and prosperity (Mokaba, 1997:i). The government and those concerned must therefore commit themselves to informing the public about environmental threats and assist in empowering society so as to create a more responsible attitude towards the environment. Environmental education should be used as a tool to empower people and enable them to become self-sufficient.

At the World Summit in Johannesburg in 2002, a decade after the Earth Summit held in Rio de Janeiro, the participating countries set a number of goals to be achieved, namely the Millennium Development Goals. These Millennium Goals were broken down into targets. The environment was recognised as the provider of produce and services that support human development so man must guarantee that development sustains the environment. Better natural resource management increases the income and nutrition of poor people. Goal 7 which aims to "ensure environmental sustainability" is most relevant to this dissertation and more specifically "target 9," "target 10" and "target 11", which are those related to environmental resource usage and the urban living conditions (World Bank, 2004a). Target 9 stipulates the following: "Integrate the principles of sustainable development into country policies and programmes and reverse the losses of environmental resources." (developmentgoals.org/environment.html).

Together, with the words of the constitution, and the aspirations of the Reconstruction and Development Programme (ANC,1994): "rekindle our peoples' love of the land, and to increase environmental consciousness among youth, to co-ordinate environmental education policy at all levels and to empower communities to act on environmental issues and to promote an environmental ethic" (Sharenet, 1995:5); the policies of South Africa match the sentiments of Target 9.

Economic and technological activities can do great harm to environments, resources and communities yet the availability and use of resources is of great importance. The

exploitation of natural, non-renewable and renewable resources for the benefit of mankind is of concern (Fien, 1993a:10). This being said, these activities are part of each person's daily life and hence cannot be ignored. Through education it is hoped that a balance can be found, where economics and technology have a minimal effect on the environment but are still effective.

As can be deduced from the preceding discussion, environmental education is difficult to define, hence the variety of definitions. The components that make up environmental education have grown. It is no longer synonymous with nature education or outdoor education; it now includes many other aspects (Bakobi, 1994:3). For the purpose of this dissertation, the researcher has reviewed many definitions and developed one which she considers most relevant to the topic:

> Environmental education is a process of educating people to become more aware, not only of the nature around them but also of the people. It must encourage people to want to change for the better, to have the 'right' values and to acquire an environmental ethic. Most importantly it must ensure that people have a greater understanding and knowledge of their environment so that they can use it in a sustainable manner – living sustainably.

2.2.3 Sustainability, sustainable development and education for sustainability

In the Oxford Advanced Learner's Dictionary, sustainability is described as a noun, the adjective being sustainable which is the use of natural products and energy in a manner that is harmless to the environment and can continue infinitely (Oxford Advanced Learner's Dictionary, 2001:1209).

The idea of sustainability was first mentioned about fifty years ago, when a few environmentalists noticed that civilisation was on a route to self-destruction (Visser and Sunter, 2002:60). During the 1970's the 'Green' movement was started and given a boost by the United Nations, when it published the World Conservation Strategy in 1980. In 1987 the Brundtland Commission, defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and

Development, 1987:43). In a sustainable world, environmental protection, economic objectives and social justice should be linked in harmony. This said, it is essential to protect the natural environment, which includes humanity, to ensure the endurance of the earth and its inhabitants (UNESCO, 1997:13).

As is the case with environmental education, sustainability has numerous definitions (Dippo, 1998:327). One of the more useful ones is that a "sustainable activity is ongoing, it can continue forever" (IUCN/UNEP/WWF, 1991:10). This definition reinforces the importance of sustainable resource usage. In "Caring for the Earth" (IUCN, 1990 ex. Fien, 1993a:10) it was decided not to define sustainable development as this leads to debate, but rather propose an ethic or values that promote sustainable living. These are set out in table 1.

TABLE 1: VALUES OF SUSTAINABILITY

Ecological sustainability	**Social Justice**
Interdependence	Basic human needs
Biodiversity	Human Rights
Living lightly on the Earth	Participation
Interspecies equity	Intergenerational equity

(IUCN, 1990 ex. Fien, 1993a:11)

The United Nations Conference on the Environment and Development that was held in Rio de Janeiro in 1992 drafted *Agenda 21,* which is a proposal on how to achieve sustainable development (Department of Environmental Affairs and Tourism, 1998:3). The intention was to bring an end to the economic era of excess and expansion which occurred over a period of time from 1950 to 1990 and to initiate an environmental era of shortage. During this time, the focus would change from growth to sustainability (Van der Merwe and Van der Merwe, 1999:1). It was realised that sustainability would only be achieved if certain targets were set. Fair justice should be ensured, poverty and inequality be deemed unacceptable and each human should have access to basic

necessities, without completely utilising or destroying the natural resources available (Sacquet, 2002:7).

Governments, international organisations, local committees and interested parties have suggested principles or objectives to sustainability. Herman Daly, former World Bank environmental economist (ex. Visser and Sunter, 2002:70) suggested that if a society was to be sustainable, it would have to ensure that:

- Resource usage rate does not exceed regeneration rate,
- Utilisation of non-renewable resources must be maintained at the rate at which sustainable renewable substitutes are being developed,
- Pollution levels must be monitored, ensuring that they do not exceed the levels with which the environment can cope.

In a similar line Holmberg (1995:1) suggested four socio-ecological principles for a sustainable society. These correspond with those mentioned above except that he distinguishes between resources extracted from the earth and those produced by society and says that neither should steadily collect in the ecosphere. According to Bass, Dalal-Clayton and Pretty (1995:9), sustainability requires the following:

- "Environmental sustainability entails an ecosystem being able to support healthy organisms, whilst maintaining its productivity, adaptability and capability for renewal (including maintaining biodiversity);
- Social sustainability reflects the relationship between development and social norms: an activity is socially sustainable if it conforms with social norms or does not stretch them beyond the community's tolerance for change.
- Economic sustainability requires that the value of the benefits to the society in question exceed (or at least are equal to) the costs incurred, and that some form of equivalent capital is handed down from one generation to the next."

Walmsley and Botten (1994:5) proposed that the objectives be "intragenerational" and "intergenerational". If the current world population is able to live well and within the

carrying-capacity of the earth, this would be "intragenerational". The second "intergenerational" objective, advocates that there be sufficient resources for future generations to be able to survive the same as, or better than, the present population. Many of these challenges although global, start out locally and can best be solved from a local level. Governance at this level is closest to the people and their problems (UNCED, 1992:240).

The South African policy on sustainable development emphasises that integrated and sustainable management of the environment is the essential basis of sustainable development, in all areas of human activity, both now and in the future. Development policies, plans, programmes and activities in all sectors that do not address environmental concerns, cannot claim to be sustainable (Department of Environmental Affairs and Tourism, 1997) which is an important condition because the term 'sustainable development' can so easily be used and misinterpreted (Jickling, 1994:114).

To be able to achieve the objective of sustainability namely that present progress does not compromise the capability of future generations to attain their own needs, there has to be a change in the attitudes and values of people towards sustainability. Three ethical principles were suggested by UNESCO (1997 ex. Dippo, 1998:328-329):

- The ethic of time – this stresses the need for action to take place before the environmental damage is irreversible.
- The ethic of complexity – this is about education, which is informative and relevant and produces understanding about the intricacy and interrelatedness of social, environmental and economic problems.
- The ethic of continuity – each living person has the responsibility, not only to the others presently on earth, but also to future generations, to make educated decisions relating to the social and economic environment in which they live.

Even though the aims, objectives and ethics of sustainability and the blueprint for sustainable development (*Agenda 21*) was in place, it was noted at the Earth Summit

in 2002 that though governments, businesses and citizens had taken small steps, the world as one had not taken the actions needed to combat and reverse environmental deterioration (Desai, 2002:12). The world in which we live is under threat, the world's health (health of the ecosystems) had fallen by 30% between 1970 and 1995, yet the stock market indices rose. Much emphasis is placed on the economic development of countries, but unless environmental concerns are considered, there will be no environment around to support human life. The value of something should not always be related to the monetary value, as how does one put a price on the air that is breathed, the loss of a species or the unseen work done by the environment to clean up after humans – humans view these as free services but they are not (Tickell, 2002:25).

Education is a means to convey the value of the environment and the cost of human activities over a period of time. Education for sustainability is a budding educational model that aims to empower everyone (young and old) to take responsibility for creating a pleasant environment for them and their children's children (World Summit on Sustainable Development, 2002:6). It is a "lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, and commitment to engage in responsible individual and cooperative actions. These actions will help ensure an environmentally sound and economically prosperous future" (National Forum on Partnerships Supporting Education about the Environment, 1994). Education for sustainability complements environmental education, sustainable development education and a number of other fields.

In South Africa, Curriculum 2005 was changed to the Revised National Curriculum Statements which has three design features: critical and developmental outcomes, learning outcomes and assessment standards (Maskew Miller Longman, 2005:2). These features give the learners the opportunity to investigate their own environment and increase their awareness of people in sustainable development. The outcomes and assessment standards give the learners the chance to do community and action research, thus realising the importance of participation in local, national and

international decisions relating to the environment in which they live (Le Grange *et al.*, 1997:9).

Concern has arisen that education for sustainable development is prescriptive and not in keeping with the definition of education..."enabling people to think for themselves". It is therefore important to ensure that learners are enlightened about the concepts relating to sustainability and given the knowledge and practical examples to make informed decisions for themselves (Jickling, 1994:116).

From the preceding discussion, it can be concluded that environmental education and education for sustainability are both all encompassing and relate to the environment and humans. Together, they encourage partners from all arenas - adult education, on-the-job training, other formal and non-formal education programmes, and the media - to reach out to as many individuals as possible. The time has come to make these changes - to educate not only children, but also all citizens about the economic and environmental realities of today's world. The education has be relevant to each individual and they must realise that their environment includes all that is around them, be it natural and wild or urban and concrete – it is all equally important.

2.2.4 The urban environment

More and more people are moving to urban areas in search of a better life and more money, but this is not always what they find. "Life is a process of change and at least in the context of human settlement, it is the capacity of people to make their own decisions and manage resources that must be sustained with environmental limits" (Brown and Jacobs, 1996:494). Urban population numbers are increasing and according to World Resources Institute (1994:27), of the 7.1 billion people living in developing countries in the year 2025, most will be living within the confines of a city. In South Africa, more than 50% of the population live in towns or cities and this puts pressure on the natural environment and resources of the cities (Department of Environmental Affairs and Tourism, 1999:22). Environmental education can be used to show the effects of urbanisation, not only on a city's resources, but also on the surrounding areas responsible for the supply of food, water and energy requirements.

The challenge in this century is to improve water quality, waste disposal, food production, energy usage, transport methods and land use within the city environment thus improving the environmental conditions and reducing resource usage (O'Meara, 1999:7). Education for sustainability within the urban environment is essential to combat degradation of the environment within the city. "Target 10" and "Target 11" of the Millennium Goals (Goal 7) reiterate this importance. "Target 10" aims at decreasing the number of people living without access to safe drinking water and basic sanitation and "Target 11" strives to improve the lives of the 100 million slum dwellers worldwide by 2020 (World Bank, 2004a). Education for sustainability should result in a sustainable community, one that continues forever by having all its residents seeking harmony between themselves and their environment (Serrano, 2000:91). Social interaction and education at a local level are needed to reduce the rate of urbanisation, enhance the inner city environment and empower the people.

The terms discussed above have to be put into the context of environmental centres to make them relevant and comparable to the ICEC.

2.2.5 Environmental Centres

When investigating the different environmental centres throughout the world, the researcher noticed that just as there are numerous definitions of environmental education and education for sustainability, there is a wide variety of centres known as 'environmental education centres', each with its own goals, objectives and survival strategies. The centres analysed for the purpose of this dissertation, are those comparable to the ICEC; no museums, aquariums or zoos have been included in this study.

The world is in a constant state of change and during the sixties and seventies, the abuse and degradation of the environment by humans was cause for concern. The solution was to educate people and teach them how to care for the environment. In Ontario Canada, the increase in the development of environmental education centres

over three decades (seventies to nineties) was noticeable. The learners visiting these centres got to experience nature and learn about the natural environment (Eagles and Richardson, 1992:14). Similarly, during the same time period, in the United Kingdom many environmental education centres known as field centres were developed. The learners were taught about environmental issues and experiences closely related to those in their syllabus. Outward Bound centres developed rapidly during the sixties and seventies in the United Kingdom and they promoted adventure activities (Cooper, 1992:5).

In the late eighties and early nineties, there was a movement to develop education centres in South Africa. These education centres complemented what was taught in the school curriculum with practical activities and character building experiences. There are numerous environmental centres, some are privately owned or run as Non-Governmental Section 21 companies, for example Lapalala Wilderness School and Delta Environmental Education Centre. There are others that fall under government jurisdiction such as the Wilgenhof Environmental Education Centre (SANParks-Golden Gate) and Graskop Environmental Education Centre (Mpumalanga). The aquariums, zoos and museums which often include topics related to environmental education and education for sustainability as part of their programmes, are not included.

The governmental environmental education centres were known as veld schools and were run by the Department of Education (Maila, 2001:3). With the change in government in 1994, the departments concerned with these centres changed and with this change there was a change in their management. Glenmore Eco-Centre, originally known as the 'veld school by the sea' now falls under the auspices of the Gauteng Department of Education (Department of Environmental Affairs and Tourism, 1996). In Mpumalanga, the veld schools previously managed and subsidised by the Transvaal Education Department were handed over to the Department of Agriculture, Conservation and Environment which is the provincial arm of the Department of Environmental Affairs and Tourism (DEAT) (Maila, 2001:3). The function of the centres in the eyes of DEAT was to conduct environmental awareness programmes, through environmental campaigns and the celebration of environmental days (Maila, 2001:3).

In Gauteng, there are a wide variety of environmental education centres that are affiliated to the Gauteng Department of Education. Environmental education at some of these centres is in the form of outdoor, ecological education, e.g. Klipspruit Environmental Centre, Rietfontein Nature Reserve, Stone River Wilderness Adventures and Suikerbosrand Nature Reserve. Suikerbosrand Nature Reserve also includes facilities for those who are physically challenged (Department of Environmental Affairs and Tourism, 1996:2-12). With the changing education system and school policies, the purpose of these centres has had to change, as many schools could no longer afford (neither the time nor money) to send the learners away for days at a time. Out-of-school activities needed to be closer to the school and fulfil part of the curriculum under consideration. These activities also had to be successful both in the eyes of the school and educators. Thus there was an opportunity for centres to open within the cities and to address inner-city environmental concerns.

It was during this time that the idea for the ICEC was developed. The ICEC was going to be one of the first examples of a sustainable house in an inner city that focused on inner-city problems and solutions. Parry and Scott (1997:3) said that ideas associated with sustainability, habitat loss and biodiversity need to be dealt with in urban areas, as this is where most children live and is what they can relate to. Not only did Parry and Scott (1997:3) stress the importance of urban environmental education but continued to include the role of partnerships and use of modern technology to get people involved in environmental activities. Urban centres could act as 'windows' to the natural, wild environment. For centres to be effective in establishing an environmental ethic in learners, they have to pass on knowledge, encourage positive attitudes and commitment and teach relevant skills. The programmes they have need to be evaluated and assessed to ensure they are aligned with the goals and objectives of the centre (Simmons, 1991:21). With this is mind the following environmental centres are discussed.

2.2.5.1 Urban 'Greenhouses'

The primary objective of the ICEC was to become an example of a 'greenhouse', one which showed examples of sustainability. In the last decade, there has been a shift towards the development of this type of environmental centre as ideally they will

provide ideas and promote sustainable living. This is in line with the change in emphasis from conservation education towards education for sustainability. The researcher investigated a few urban 'Greenhouses' to use as comparisons to the ICEC later in this study.

a.) EcoHouse – Leicester, United Kingdom

The EcoHouse is an internationally renowned environmental show home that demonstrates many 'green' features and inspires visitors to adapt their homes to become more sustainable. The trust, Environ, manages and raises funds for the centre. The EcoHouse closed for a short period for refurbishment and additional funds for this were obtained from the National Lottery, European Union and many businesses. It also gets financial support from Leicester City Council. It has an organic garden, an eco-shop and meeting room. Its visitors include school groups, tourists, royalty and Government Ministers. It also hosts many special events (enviro.org.uk/ecohouse).

b.) The GreenHouse Project – South Africa

The GreenHouse Project is a local, non-governmental environmental centre in the inner city of Johannesburg. It was conceptualised in 1993 by the members of Earthlife Africa, Johannesburg due to the demands of society to promote issues of environmental sustainability. It received funding from the Danish Agency to conduct a feasibility study that was started in 1997. This comprehensive process took two years and the design of the centre started in 1999. It was only in 2000 that the GreenHouse Project became independent and registered as a Section 21 non-profit company.

The GreenHouse has a variety of national and international partners and 'frogs' (Friends of the GreenHouse). These include environmentalists, architects, government officials, community members, artists, educators, etc. It has five programmes that act as the framework for achieving their many aims. Each programme has its own objectives and achievements. The first was to develop examples of a 'green' building and collect research related to ecological building methods and materials. Permaculture, urban agriculture and landscaping are part of a specific programme. The GreenHouse Project promoted these topics by doing training in communities, working with pre-school children, mothers, youth groups and others as well as creating

demonstration gardens. The Green Living and Development (GLAD) files are information booklets available via the internet or at the centre and they encourage sustainable urban development by suggesting ideas and supplying methods about how to achieve it. Along with other types of networking and media, the GreenHouse Project is achieving the objective of communication and dissemination of information. Community outreach is being achieved with the help of partners like Sustainable Energy for Environment and Development (SEED) (greenhouse.org.za.). The centre is open during the week and one Saturday per month.

c.) The Earth Centre – United Kingdom

The Earth Centre opened in 1999 and was known as the first Landmark Millennium Project. It was an innovative centre which was especially designed as a working example of sustainable development. It sought to present possible solutions and ideas rather than definitive answers. It had different halls that covered different aspects of the environment. Unfortunately it has had to close and 55 people were retrenched (earthcentre.org.uk).

d.) Centre for Alternative Technology (CAT) - United Kingdom

The name of this centre explains the type of education for sustainability programmes it offers. Activities include an eco adventure playground, permanent displays of "Megan, the mole and her insect friends", a wave power display as well as a 'gaiascope' cinema, inventors of the future (children create their own invention using recycled materials) and a carbon fitness check. These are interactive activities for the children that enable them to learn about sustainability issues while still having fun. The adults can learn about the different types of renewable energy, organic gardening and environmental building (cat.org.uk/news/press).

e.) Potter's Earthship / Turtle School (Bancroft - Canada)

Cold-drink cans, tyres, sand and concrete were used to build this example of a solar-powered home (an earthship). It features an energy efficient organic garden and runs hands-on workshops and tours on herb spiral construction, earth home construction and grey water recycling (*sunspace.org/en/en-b-mainpotterpage.html*).

f.) Oberlin College – USA

At Oberlin College in Ohio, the students and tutors working in the Department of Environmental Studies together with experts are designing a new building on campus. The building will be sustainable in terms of design, materials, electricity and water. It will be an example of sustainability using modern technology. It aims to release zero emissions and materials used will be non-toxic and recycled. Other features include ecological waste water systems, applications of solar and other renewable energy technologies and ecological landscaping. It is intended to be a centre for interdisciplinary education, research and action on an intricate range of problems and opportunities facing humankind in the 21st century. This centre is to be a prototype to encourage other colleges and universities that are under construction or being renovated to opt for the sustainable option, not only because of the design and minimal environmental impact, but also because it aims to reduce the billions of dollars spent annually to operate physical facilities (Billings, 1994:4). Obelin College is still developing innovative tools and practises to increase the awareness of resource consumption and well as alternatives (Viancourt, 2005:3).

The above examples are all urban centres where the main focus is on sustainable development, in terms of architectural design, materials used, management methods and education. These centres were built in a manner which best illustrated how sustainability principles could be adopted and achieved. They demonstrated different methods, mechanisms and technology that can be used to ensure that the citizens of the earth effectively use rather than abuse planet earth. The development of such centres requires:

- Research and feasibility studies such as was done by those involved with the GreenHouse Project and Oberlin College,
- Funding e.g. the EcoHouse,
- Innovative and interactive learning programmes e.g. Centre for Alternative Technology and Potter's Earthship

Even if all of these above are tried, the survival of the centre is not guaranteed e.g. The Earth Centre.

2.2.5.2 Urban Environmental Education Centres

The ICEC is situated in the urban environment and the focus of the programmes it developed was related to inner city problems and education for sustainability. There are other urban environmental centres that focus on environmental education as described above and their programmes still include ecological education. If these local centres have a clear vision and work in partnership with local authorities, much can be achieved. Learners and others, whose voices are rarely heard, will have the opportunity to make a difference. Such a "bottom-up" partnership version of *Local Agenda 21* is close to that originally proposed by the 1992 Earth Summit on the Environment and Development (Parry and Scott, 1997:3). Examples of urban environmental centres are described below.

a.) Delta Environmental Centre – South Africa

Delta Environmental Centre was established over 25 years ago and is the largest urban facility of its kind in South Africa. The building, which consists of a natural history museum, a discovery centre, a resource library, an auditorium and function rooms, is situated within Delta Park, a natural area along the Braamfonteinspruit. Its aim is to enable people to improve the quality of their environment through innovative education and training programmes and it promotes the management and sustainable use of all resources. It achieves this by creating awareness about environmental issues; sharing appropriate knowledge; introducing new and enhancing existing participants' skills; developing responsible attitudes to the environment and on-going monitoring and assessment of programmes offered. More than 4000 participants visit the centre per month. They differ in age, ability and background and yet the centre caters for each of them. Delta runs courses for educators and learners; it has a conference facility, a sensory trail and strong partnerships with businesses such as Alpha Limited and Rand Water. It is involved in numerous on-going community projects. This centre is open seven days a week (deltaenviro.org.za).

Delta is a successful environmental centre because the officers are fully committed and are able to identify a potential problem and are empowered to find a solution and take action to solve the problem. It is a dynamic centre that changes its mission and objectives with the changing environment in which we live, hence its programmes are innovative and relevant. It is one of the few centres that is a Section 21 company and

thus has more freedom because it does not have to adhere to government policies and bureaucracy (Shongwe, 1997:57-58).

b.) Centre for conservation education – South Africa

This centre is based in Wynberg, Cape Town. On a visit to the centre in 1999, the researcher noticed that although it is an urban centre, it focused on ecological and historical education. The centre has a library of resources and a small school museum. It offers environmental education programmes relating to the social, political, cultural and natural environment that can be tailored to suit the requirements of the school. On each visit a nominal fee is paid by each learner (Educator, 2005: *pers com.*). This centre is staffed and run by the Western Cape Department of Education.

c.) Brisbane Urban Environmental Education Centre – Australia

Newmarket State School is the home to this environmental centre. It is near to areas that are affected by urban renewal and redevelopment. It provides curriculum support by assisting with curriculum development, by offering the use of its resources and equipment and by providing distinctive learning experiences for learners. The topics include the social and built environment; individuals and social groups; natural systems and resources and sustainable urban living. It caters for all children and young adults, from pre-school to tertiary education levels. Further development in Newmarket is taking place in the form of a visitor centre and model urban living projects. (education.qld.gov.au/schools/environment/outdoor/brisbaneurban.html).

d.) Urban Environmental Education Resource Centre - Revitalization of an Urban Neighbourhood- Detroit

This environmental education centre was developed to encourage the revitalization of Detroit's inner city. Cass Technical High School is working in partnership with the Urban Environmental Education Resource Centre on a project, "Urban Environmental Education in Detroit", which uses geographic information systems (GIS) to assist students to observe how environmental conditions in their neighbourhoods could be improved by using GIS mapping applications.

The statistics that they collect, such as lead levels in drinking water, are compared to standard acceptable levels. This gives the students an opportunity to put their

textbook knowledge to practical use and gain experience with technology that is available today. They therefore have the opportunity to make a valuable contribution to the improvement of the community in which they live (gcrio.org/edu/pcsd/chap4.html).

Each of these urban environmental education centres has a unique way of being of benefit to their target market. Delta Environmental Centre started as a museum and has evolved into a dynamic training centre that equips those who visit it with the knowledge and skills not only to identify problems in the environment but also teaches techniques to solve them and offer support in this regard. Similarly the Centre for Conservation Education also started as a school museum, but it has changed and now teaches about environmental issues relevant to those visiting it. Brisbane Urban Environmental Education Centre and the Urban Environmental Education Resource Centre in Detroit were both created to assist the local communities to adapt and make the best of the ever-changing urban environment they lived in. These centres offered the tools to the communities to monitor environmental conditions and make educated decisions relating to the health and wellbeing of those within the community and surrounding areas.

Apart from being an urban environmental education centre the ICEC was established to form partnerships with local government departments and create environmental communication, awareness and management strategies which leads to the next 'type' of environmental centre.

2.2.5.3 Urban Environmental Communication and Management Centres

a.) Alam Bandar Centre – Malaysia

The Centre for Urban and Environmental Management (Alam Bandar) was established as part of the National Institute of Public Administration's (INTAN) initiative to increase the effectiveness and efficiency of the local authority in the aspects of urban and environmental management. It has three units, the Urban Management Unit, the Environmental Management Unit and the International Unit that supports the

services offered by other centres. The first two units are involved in teaching. They train local authority personnel, including the councillors as well as other government agencies involved with environmental and urbanisation issues.

Urbanisation has occurred at a rapid rate causing many serious problems. The urbanites are highly educated and have high expectations of the local councils. This being said they realise that they also have a role to play in ensuring their quality of life. The centre holds courses for the community members, educating them about their role, equipping them with knowledge and showing them the latest technology available to reduce the negative effects of urbanisation. This new approach in urban management and sustainable development involves changes in the urban governance. It involves participation and empowerment of the community.

The International Unit, apart from working with other centres, assists in maintaining relationships with donors and funding agencies both international and national (intanbk.intan.my/cda/m_campus/ktd_sub_1.php).

b.) Parivesh– India

The Centre for Environment and Development, aptly named Parivesh, meaning holism was developed as part of the Yashwantro Chavan Academy. Initially it was used as a training, research and administration facility for environmental interventions at the district, municipal and state level within the Government of Maharashtra.

Training focused on environmental concerns, namely planning in rural, urban and infrastructure sectors for officials, non-officials, university academics and non-government organisations. This centre is similar to the Alam Bandar Centre. The participation and group effort is encouraged to support government departments in the development of programmes relating to environmental protection and nature conservation, while ensuring sustainable economic development.

A computer-based classroom assists in the training of participants and this was made possible by United Nations Education and Development. The objectives of the centre are to reinforce Yashada Academy's training commitments which are focused on

environmental concerns with perspectives on planning in rural, urban and infrastructure sectors for officials, non-officials, university academics and non - government organisations. The centre also provides in-the-field information and databases to integrate current case studies for future courses and workshops. The objectives are also aligned with the goals of the Academy and confirm the importance of governments to promote education for sustainability. The training programmes are offered on a continuous basis due to the strong relationships with its partners and are related to environmental protection, nature conservation and development administration, with rural and urban development being emphasised. The partnerships also provide a forum for interaction and participatory action between partners e.g. government, university academics, non-governmental organisations representatives, post-graduate faculties from environmental sciences, biology and health sciences disciplines, and international bodies such as World Bank, UNEP and United States AID (USAID); all of whom support the centre.

Planning for the future is imperative and this centre has a Five Year Perspective Plan for 2004 to 2009 that will promote growth and encourage financial funding for projects from various sources (yashada.org/centre/ced.htm).

c.) Environmental Education and Communication Centre of Tianjin City - China

Tianjin Environmental Education and Communication Centre is responsible for environmental communication and education work of Tianjin. This is a small centre that is fitted with a pickup camera and editorial equipment. The function of this centre is to create and distribute environmental education communication material such as environmental films. Its target is primarily schools and universities. It also organises environmental education training workshops. Apart from this, it must make these materials available publicly and improve the environmental awareness of the communities by promoting environmental education activities within the city. This centre finds it challenging to continue the work they are doing due to the shortage of funds (zhb.gov.cn/english/chanel-1/education.php3?position=24).

Communication is vital for the people to become aware of environmental issues and make informed choices. As can be seen from the above centres, generally governments have policies and plans in place relating to environmental education and management and yet the people on the street don't know enough about them. It is for this reason that centres such as Alam Bandar Centre, Parivesh and Environmental Education and Communication Centre of Tianjin City were developed. It is their role to disseminate knowledge and educate people about environmental issues.

If a person was asked to picture an environmental centre in the 1980's or early 1990's the researcher believes that a centre found in a natural environment would come to mind e.g. in the bushveld or fynbos biome or along the coast where there is minimal human impact such as development and pollution i.e. they would imagine wildlife centres.

2.2.5.4 Wildlife Centres, Nature Reserves

a.) My Acre of Africa – South Africa

'My Acre of Africa' is a trust that believes "that sustainability and the environment must be made a cornerstone of education." This Trust has built an environmental education facility near the Kruger National Park that educates communities on how to combine sustainable economic development and environmental protection. It focuses on the education of local children and young adults. Those from further a-field are welcome and the trust realises that distance is a limitation and hence is developing a distance education strategy. Adults would also benefit from visiting the centre as here they would learn that they play a vital part in ensuring a sustainable future for the environment – "an endangered heritage" (myacreofafrica.com).

b.) Kortright Centre for Conservation – Canada

Kortright is the largest environmental education centre in Canada. It consists of 800 acres including a river valley, marshes, meadows and forests, 16 km of trails, a visitor centre, green energy exhibits, year-round guided walks, special events and education programming. This centre produces most of its own power and processes its own wastewater. It has workshops on wind and solar power and makes use of volunteers to assist in the running of the centre (kortright.org).

c.) Everdale Environmental Learning Centre – Canada

This centre offers practical opportunities for everyone of any age. It is a non-profit learning centre with a sustainable organic farm within a wildlife habitat where hiking trails are found. It has examples of sustainable technologies including solar and wind energy and straw-bale constructions. It offers workshops related to all its features and offers public tours and a school programme and supports local community agriculture. Volunteer work and apprenticeships are offered by this centre (everdale.org).

d.) Umgeni Valley Education Centre – South Africa

The Wildlife and Environment Society of South Africa (WESSA) did fundraising and bought a portion of land on the banks of the Umgeni River. This piece of land was to be conserved (keep it in as natural state as possible) in order to provide for the needs of environmental education. Almost three decades later, it is still providing environmental education courses, but has broadened its scope to make a contribution to the growth of community-based environmental projects (Clacherty *et al.*, 1996:22).

The centre is found within the valley and the geology, fauna and flora all enhance the environmental education programmes offered and the experiences the learners engage in. Surrounding the centre are self-guided trails and streams for swimming in (wildlifesociety.org.za/Umgeni.htm).

e.) Graskop Environmental Centre –South Africa

The Graskop Environmental Centre is situated in the grasslands of Mpumalanga. The programmes it offers are focused on ecological education (an eco-audit, a night march, eco-adventure courses etc.). The re-use, reduce and recycle programme as well as the project which teaches the learner to build a shelter are related to sustainability and each programme can be tailored to the wishes of those visiting the centre (Maila, 2001:103).

Wildlife centres or nature reserves used to be sanctuaries where people could go to enjoy the 'outdoors', the 'wilderness'. These centres have the potential to teach about environmental education and education for sustainability both through learning programmes and activities that are conducted but also subliminally because as people

experience the wonders of the 'wildness' they are forced to see that these areas of conservation are surrounded by a fence isolating them (in a small way) from the environmental misuse that is occurring in their own environments – a seed of 'what if' is planted in their minds - what if I recycled, what if I saved more water, what if I planted more plants – could my immediate environment become a sanctuary?

As it became more difficult (expensive, shortage of transport, not enough facilities) for schools to go on excursions or gain access to natural environments, it became important for educators find projects which would enable them to teach environmental education and sustainability within the school environment, hence the start of Eco-schools.

2.2.5.5 Eco-schools local and international

Recently in South Africa, and worldwide, there has been a movement to encourage scholars to get involved in environmental activities. Environmental education is not part of every syllabus and not all schools can afford to visit environmental education centres and as a result the Foundation for Environmental Education developed an international environmental education programme for schools, known as eco-schools. Eco-schools are committed to actively bringing the environment into the school curriculum and also improving the school environment. In Europe there are 25 countries involved and at least 7000 schools have successfully performed activities that have improved their environment (Santos and Crost, ex. Naugah and Sooknah, 2003:8). In South Africa, the Wildlife and Environment Society of South Africa is developing and managing this programme. The focus is on strengthening the curriculum (in line with the Revised National Curriculum Statements) in the hope that activities will simultaneously enhance the school environment and sustainability (Ward, 2003:19).

a.) *Treasure Beach Environmental Education Centre*

This centre chose to register as part of the eco-schools project so that it could be an example of an 'eco-school' to the schools that visit. It focused on special environmental days, developed an indigenous garden and implemented a recycling programme (eco-schools.org/countries/news/news_rsa).

2.3 Conclusion

The years 2005 to 2014 have been declared the "Decade of Education for Sustainable Development". This confirms the need to integrate sustainable development into all educational systems and hence education for sustainability is the key towards change throughout the world (Pigozzi, 2003:30).

Chapter two elaborated on the important terms and concepts relevant to this dissertation. Environmental education and education for sustainability go beyond the biological and physical sciences to encompass economic, political, and social systems. These systems affect the natural and built, rural and urban environments. Environmental and sustainability education deal with these systems at the local, national, and international levels and good education is one that realises this and teaches the knowledge and skills necessary to develop inquiring minds that can critically analyse the decisions that each of us make and the consequences thereof for humanity and the Earth.

It also described a number of different types of environmental centres, each having certain characteristics, objectives or management methods that will be discussed in chapter four as part of the case study. The relevance of the grouping of the centres, namely urban greenhouses, urban environmental education centres, environmental communication centres and wildlife centres is important and will be explained with respect to the ICEC in later chapters. It can be seen from the examples of the centres mentioned that each has been developed to fill a niche and meets the needs of society at the time and as the needs and expectations of society advance, the characteristics and programmes of the centre have evolved accordingly. This has to be done to ensure the continued existence of each centre as all are dependant on the citizens that utilise them for survival.

In the next chapter the research design and methods used will be discussed. When conducting research there are various techniques that can be used and systems which must be adhered to. The researcher investigates these methods and chooses which process is best suited to this project and suggests why.

CHAPTER THREE

RESEARCH DESIGN

3.1 Introduction

Research design is defined as a framework that directs the researcher in the process of assembling, analysing and interpreting information. It proves that the information collected has been carried out in a manner as to reduce the subjectivity of the conclusions and is thus a true reflection of the research done (Nachmias and Nachmias, 1981:75).

For this dissertation the researcher has chosen to use the 'case study' design as a template into which the information was compiled and the data retrieved. The objective of a case study is to investigate the characteristics of a particular system of the community (Huysamen, 1994:168). The ICEC is investigated in its totality and holistic descriptions and analysis of the objectives and the activites of the ICEC form the core of this particular case study.

Case studies are described by Stenhouse (1988:49) as "...naturalistic, qualitative, descriptive, responsive, interpretative" and "the collection of data on site is termed fieldwork." The methods used to conduct the "fieldwork" were interviews and questionnaires as suggested by Stenhouse (1988:49).

In keeping with the above definitions the researcher did fieldwork at the ICEC and complemented this data with that compiled in chapter two. The researcher adopted this approach in order to understand why the ICEC was developed and to determine how successful it was in the eyes of those that conceptualized the idea, as well as others, and to conduct research that was relevant and produced valuable information for those embarking on similar projects to use.

Chapter three explains how the above mentioned processes took place, why the particular site was chosen and the instruments used to conduct this study.

3.2 Choice of research methodology

Information collected can either be analysed qualitatively or quantitatively. Qualitative research involves assessing the quality of things whereas quantitative research involves measuring quantities of things, more especially numerical quantities (Reaves, 1992:16). Similar to Reaves, Merriam (1991:18-19) indicated that qualitative researchers are predominantly concerned with process – the inception, development and sustainability of the centre rather than outcomes or products. The emphasis in this research is on processes and meaning. Another difference between qualitative and quantitative research is the notational system utilized to report the findings. Figures, numbers and inferential statistics are represented by quantitative data while qualitative research tends to read like a story.

As can be seen from the above definitions, for this particular research project, qualitative research would be much more suitable in describing the process and assessing the provision of environmental education by the ICEC. It is difficult to assign a numerical value to people's experiences and opinions thus quantitative research is inappropriate.

There has been concern that it is difficult to measure development efforts, particularly of the social dimension using the traditional methods (James *et al.*, 1983:20). The best method to overcome this is to use the interpretative approach (Marsden & Oakley 1991:315) which is a form of qualitative analysis.

Qualitative research is an interpretative approach and is appropriate for measuring social projects. "The interpretative approach insists that evaluation must be participatory. A participatory evaluation approach is not only an evaluative, but also an educational approach" (Feuerstein, 1988: 24). This is why those involved with the centre, both from a management and user point of view have been interviewed and given questionnaires to complete.

3.2.1 Qualitative methods

Qualitative research defined by Mertens (1998:159) is "multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them." This definition is similar to that of a case study by Stenhouse (1988:49).

The above definition describes the manner in which the ICEC was researched. The researcher observed the working of the centre in its natural setting, studied documents related to it and later interviewed those who were involved in its establishment and management.

3.3 Selection of site

Towards the end of the last decade, more and more emphasis was placed on inner city environmental issues. Air and water pollution, population and resource consumption directly affect urban environments (Iyer-Raniga and Treloar, 1999:230) as do social issues such as conflict, marital instability, lack of education and poverty, and these problems make it difficult for communities to interact with the natural environment in urban areas (Kahn and Friedman, 1998:29).

There were few service providers within the urban environment to help combat these issues and this was where the idea for the ICEC was born. The aim of the ICEC was to be one of the first urban environmental centres to investigate these problems. It was planned to create awareness about inner city threats, offer explanations to overcome them and facilitate the conservation of the city - culturally, physically, naturally, politically and economically. Although there were many service providers in the inner city offering a wealth of information about various sectors of life, a holistic plan of programmes for the urban environment was lacking. Apart from doing this, the ICEC was going to facilitate the linking of environmental efforts within the city, whether it was between the museums, the zoological gardens and the museums, the schools and local government etc. (Inner City Enviro Centre, 1998:2).

The researcher investigated the ICEC because although there were numerous environmental education centres in South Africa (see chapter two) at that time, none of them focused on urban environmental issues. The researcher also had the opportunity to work at the ICEC for 18 months and this too motivated her to initiate this research project.

The establishment and development of the ICEC was a joint venture by Lefase La Rena and Museum Park funded by Pretoria Inner City Partnership. "Lefase La Rena" is an organisation that succeeded in bringing together various environmental stakeholders in the Tshwane Metropolitan Area and provides a forum and platform for many environmental projects. In essence Lefase La Rena is a facilitator of role players and projects connected to environmental education in Pretoria (Vogler, 1997 pers comm).

"Museum Park" is a Section 21 Company which explores the tourism potential of several museums and historical sites in Tshwane. It does this by coordinating heritage activities, tourism courses and workshops, and bus tours of the city. The Museum Park corridor is regarded as the largest focus point of cultural resources in Africa. It is also an attempt to visually and structurally group a number of diverse museums, buildings, spaces and activities all related to conservation and education into a unified whole (Museum Park Business Plan, 1998:2).

The then Pretoria City Council realized that a new approach to planning, development and environmental management of Pretoria was necessary. Concerned business people, stakeholders and representatives of various interest groups joined forces and established the Pretoria Inner City Partnership (PICP) in 1996. The PICP slogan was "Cherish the heart of our city" and the renewal of the Inner City was a starting point. Task teams and working groups were formed and they produced the guidelines, projects and later the strategic development framework for the PICP. One of these projects was the establishment of the Inner City Enviro Centre. The PICP provided the capital costs for the development of ICEC (Calitz, 1998:3-7).

3.3.1 Description of site

The ICEC was originally the old Mint manager's house in Pretoria. It is situated on the grounds of the Cultural History Museum on the corner of Bosman and Visagie Streets. The house was to be transformed into an example illustrating sustainable living conditions within the city. As it was close to major transport routes, both, train and road, the community, learners and educators would have easy access to it and have the opportunity to visit it and participate in environmental education programmes (Inner City Enviro Centre, 1998:1). Many private businesses are leaving the inner city and some of the government departments have considered following suite, for example Department of Trade and Industry. If government departments had to move to the suburbs, it would "only confirm that inner city decay is irreversible," instead they should stay, not only for practical reasons as many people flow into the city each day but also to inspire confidence by putting their money into rejuvenating the city (Granelli, 2000:3).

The recycling of buildings is one factor that can contribute to sustainability in the urban environment. By modifying existing buildings and adapting them to new uses, the costs of construction, not only in monetary terms but also in terms of energy involved in obtaining and using new materials, and the design and construction process, can be considerably lower than those incurred in the development of new buildings. In addition, land as a resource is conserved and building services can be altered to reduce consumption of energy and other resources (Darroll, 2001). The task of converting an old house into an example of a sustainable city dwelling was part of the plan for the ICEC and was undertaken in collaboration with Holm and Jordaan of Solar Fabrik. A business plan was drawn up that would be implemented in phases and the application was submitted to DANCED to ask for funding (ICEC Report, 2000b:2). It was also suggested that certain rooms in the house be sponsored by certain companies e.g. the "Mondi" media room (ICEC Minutes, 1999:2).

It took six months for the basic renovations to be done to make the house functional. It was opened on the 18 May 1999 on National Museum Day. At this time various temporary exhibitions on sustainable living, such as the recycling of tins, plastic and paper, the use of a sun stove and water saving technology were on display (Helfrich,

1999). At a later stage sustainable technologies including dual flush toilets and aerated showerheads were installed (ICEC Minutes, 2000a:1).

An outside water room was developed where examples of water saving devices were exhibited and related lessons given. The Water Commission sponsored this example of sustainable technology (ICEC Minutes, 2000b).

The beautiful gardens that surrounded the ICEC included indigenous and exotic plants and were a haven for the different birds and insects which could be found in the inner city. These gardens were used to teach learners and educators about the ecological branch of environmental education.

Due to its locality and resources the ICEC was to become the "nerve centre" (support mechanism) where the community could become more involved in environmental education and sustainability issues. It would translate research information, introduce environmental educational strategies, develop public policy and organise at the community level further sustainable courses and action. The ICEC was developed to promote the concept of "education for sustainability" (Inner City Enviro Centre, 1998:3). Whether it provided the necessary tools and information to perform this function in light of its objectives is the scope of this research.

3.4 Selection of participants

The researcher selected certain respondents as a sample for the particular study. A sample is defined as a "limited number of a statistical population whose characteristics are studied to collect information about the whole" (Merriam-Webster, 1985). The seven respondents selected and interviewed were all actively involved with the ICEC either initially and, or during the time of the research project. The interview questions were related to the development of the ICEC, their expectations for the ICEC, their own definitions of environmental education and sustainability and the implementation thereof with regards to the ICEC. This was done to gather accurate information as to the creation and development of the ICEC.

After the first interviews had been conducted, the researcher realised that additional information needed to be collected from the users of the ICEC and extra questions were added to the later interviews. Questionnaires were given to seventeen teachers or principals at schools who were participating in the Environmental Awards Systems for the Youth (EASY) project that encourages educators, learners and community members to become aware of and involved in environmental issues in their neighbourhood. The project was managed by the ICEC. The questionnaire covered topics such as environmental education, the importance thereof, the needs of the teachers, how they would teach certain environmental concepts and where they would take their learners on school outings and what influenced their decisions to choose a certain place. This form of sampling is termed purposeful (or theoretical) sampling as it allows for the "...identifying of information-rich cases" (Mertens 1998:261) and offers the researcher the opportunity to gain a significant amount of information for each case study. The goal of this sampling is not to generalize to the population but to find respondents who are able to offer in depth information and their personal experiences.

3.5 Data collection methods

A variety of methods were used to collect data with interviewing being the main method. The data sources and methods used included:

- Individual interviews
- Document analysis and observation
- Questionnaires

The main advantage of using multiple methods is that it allows for triangulation. Triangulation is essential in the analysis of qualitative information where reliability is often a concern. It gives the opportunity to compare the sources and if they correspond, they cross validate each other and if they disagree, the reason must be explored as it may explain certain phenomena in the investigation (Robson, 1993:383). Patton (1990:470) sees triangulation as "...a process by which the researcher can guard against the accusation that a study's findings are simply an artifact of a single method, a single source or a single investigator's bias."

3.5.1 Interviews

Interviews are an ideal tool for gathering information for qualitative research (Krathwohl, 1998:285). Qualitative interviews usually "...refer to in-depth, semi-structured" types of interviews that "are characterized by a relatively informal style". The interview questions are centred on topics relating to the research (Mason, 1996:38). In this study, interviews were used to clarify the initial ideas for the development of the ICEC and the provision of environmental education towards sustainability. The original management committee and the members present in 2001 were interviewed (Appendix 2 - Interview framework 2001), initially to collect information, and four years later more interviews were conducted (Appendix 3, Interview framework 2004). The time period between the two interviews was to give the ICEC a fair chance to be sustainable, ideas to be clarified and certain questions, which had been omitted in the first interview were subsequently introduced e.g. "Was market research conducted before establishing the ICEC?" The time difference also allowed the researcher the opportunity to distance herself from the ICEC and thus reduce bias.

The researcher used the semi-structured interview method where structured questions were interspersed with unstructured conversations and variations on the prepared questions. These questions were used to initiate discussion on the topic and where necessary the researcher was able to clarify information as the conversation unfolded. This method was chosen as it has been proven to give high quality data (Ngwenya, 1998:25). The responses were written down during the interview and tape recorded for transcription and reference purposes.

The researcher capitalised on the merits of the interview method, in particular that it facilitated easier access to confidential information, in a face-to-face situation. It also provides an opportunity for an in-depth examination of certain selected topics. Accordingly, the researcher was able to verify information obtained from ICEC documentation. While the advantages of the interview method were many, the researcher was aware of certain limitations. These include a high demand on time, energy and money and problems of quantification of qualitative data obtained.

Another problem that could occur using interviews and not questionnaires is that although interviews allow for greater depth than is the case with other methods of data collection, they can be prone to subjectivity and bias on the part of the interviewer. It is for this reason that a second interview was conducted a few years later.

Ethical considerations

Casley and Kumar (1998:34), in support of Reaves (1992:192), show that a most important aspect of the setting for an interview is that it should be private. Interviewees have difficulty expressing themselves when other people are present. The individual interviews were held where it best suited the interviewees, either at their offices or homes.

On meeting the interviewees, the researcher introduced herself, and gave them a little background into the purpose of the interview and the study being conducted. The researcher also asked for permission to tape the interview as well as take notes to minimise bias.

Each interviewee was asked the same questions. Some questions had fixed responses which resulted in uniformity and greater reliability, but some were open-ended and the answers of these were then grouped into categories. Coding of the questions made analysis easier.

Interviews are verbal reports that are subject to common problems of bias, poor or inaccurate recall and poor or inaccurate articulation. As can be seen from the above all opportunities were taken to reduce bias and increase reliability. Other procedures were also taken to corroborate interview data with information from other sources, namely document analysis (Yin, 1994:85).

3.5.2 Document analysis and observation

The researcher had access to primary sources of data in the form of remains or relics namely, official minutes, records, files, letters and e-mails and these were useful for providing sound evidence about the past and present. The documents were assessed

using the following criteria: authenticity, credibility, representativeness and meaning. As the researcher worked at the centre for a number of years, observation was always used as a research tool. It gave her a better understanding of the documents and helped in contextualising the information obtained from the documents, questionnaires and interviews.

3.5.3 Questionnaires

Questionnaires are used to assemble copious amounts of information relatively easily and inexpensively. The views of educators who have been involved in a project with the ICEC, were obtained by means of a questionnaire, which investigates their understanding and needs in terms of excursions and environmental education. This questionnaire provided the researcher with data that could be analysed, evaluated and sorted into concepts and themes related to environmental education and education for sustainability.

The design of the questionnaire was in accordance with the layout suggested by Krathwohl (1998:365) except that it was longer than recommended. The first few pages were easy to read and complete, the questions asked related to the participants and their schools. From there the questions flowed into the participant's thoughts and interpretation of the environment and excursions. Lastly the participants were asked directly about the ICEC and the different teaching methods they would use to provide information on environmental education topics (Appendix 4 -Questionnaire).

3.6 Duration of study

The research project was done over a period of four years. The method used was longitudinal research, which examines the characteristics of the ICEC and the opinions of the participants more than once, thus producing data that is more significant compared to cross-sectional research which takes a snapshot – a once off observation of the field of study (Neuman, 2000:30).

Longitudinal research can be further broken down into: time-series research – where data is assembled about the same group, the data is collected on a group over

multiple time periods; panel study whereby the same participants and organisation are studied over a period of time and case study where the researcher examines many features of a few individuals, groups or organizations (Neuman, 2000:31-32). In this research project the researcher has made use of each of the methods mentioned above:

- The interviews with the management committee is an example of a panel study
- The exploration of the development and changes that occurred at the ICEC and the programmes it runs is an example of case study research
- The questionnaire that was completed was a once- off, thus cross-sectional research.

Combined, the data received is valuable and varying, but needs to be carefully analysed to ensure the results are a true reflection of the study.

3.7 Data analysis

The data collected from the fieldwork has to be evaluated and only that which has value is to be kept and analysed. The methods of analysing the data include coding, content analysis and inductive analysis. Coding is a method of interpreting the data making it easier to access and reduce and thus analyse. When coding, an adjective or descriptive phrase is assigned to each unit of notes (Krathwohl, 1998: 307). If the codes are recurring, this indicates their importance and they then are combined to form themes.

Content analysis is where themes or patterns representative of the study are observed in the codes, whether it be in the text, or other communication mediums (Neuman, 2000:507). When themes emerge from the data and are not part of any preconceived issues, inductive analysis has to be conducted (Diamond, 1999:151). One starts with observed events and works toward abstract ideas or common principles (Neuman, 2000:511). In addition to the themes, quotations from the participants can also be used in the analysis. Direct quotations are an effective way to illustrate the participants' experiences (Diamond, 1999:153).

Wolf and Tymitz (1978:24) ex. Diamond (1999:153) suggested that analysis be broken down into two phases, data expansion and data reduction. Data expansion involves elaborating on the information obtained, asking questions such as, "what are the possible explanations for..." Part of the data reduction process can be described as coding. They embellished on this theme, suggesting that data has to be carefully selected and condensed into a manageable form especially as during a comprehensive qualitative study copious amounts of research can be collected (Wolf and Tymitz (1978:25) ex. Diamond (1999:155).

Some of the themes that emerged from the analysis of the interviews include:

- The participant's definition of environmental education and sustainability
- The involvement of the participants in the ICEC and other projects over the study period
- The setting of the study as this changed half way into the research and
- The actions taken by the participants and the ICEC to provide environmental education.

A few of the themes remained the same when the questionnaires were analysed, specifically that of environmental education and the involvement of the participants. New themes that emerged include:

- The methods the participants would choose to teach a few given environmental education topics
- How they decide where to go on excursions and what factors influenced their decision and lastly
- What lessons in environmental education towards sustainability interested them.

All of the above themes were based on content analysis. Those related to the relationships of the participants and their perceptions were inductive. Other codes which have been suggested to be explored are:

- Activity codes (regular occurring events e.g. meetings at ICEC, school visits, annual projects – Water Week)
- Strategy codes (the manner in which things are accomplished by those working at the ICEC and the management committee)
- Event codes (infrequent happenings at the ICEC e.g. opening of ICEC, Ikebana soriree, Art of Living course) and
- Process codes (the order in which events take place) (Bogdan and Biklen, 1992:167-172 ex. Krathwohl, 1998:313).

3.8 Trustworthiness of Data

It is important for the research to take every step possible to ensure that the readers trust the information that they are reading. In quantitative research it is easy as the numbers can be used to prove a theory. In qualitative research this is not the case and the data has the potential to be biased and / or subjective (Krathwohl, 1998:337). To gain trustworthiness the researcher has taken every step possible to minimise the effects of bias and subjectivity and increase reliability. These include using more than one data source, doing the research over a longer period of time, recording information both on tape and in note form and following a logical, retraceable path.

Reliability

McMillan and Schmacher (1993:385,386) state that, "...reliability is the extent which independent researchers could discover the same phenomena and to which there is agreement on the description of the phenomena between the researcher and participants." Reliability in qualitative research refers to the consistent manner in which the researcher records, analyses and interprets the meaning obtained from the participants. It is a difficult process as each researcher is an individual and the manner in which they observe, interview and analyse data will differ, thus steps must be taken to ensure that the information obtained would be similar to that of another researcher performing the same task, thus increasing reliability (McMillan and Schmacher, 1993:386). As mentioned above, the interview answers were compared with the existing documentation and observation to ensure that the facts correlated. The interviews were also conducted twice to see if opinions changed over time.

The reliability of qualitative data depends in the first instance on the unprejudiced approach of the interviewer towards the themes that are being researched. Any form of bias on the part of the interviewer will influence the results negatively. The reliability of the data improves if the interviewer has no misleading questions at his disposal. The researcher must simply be directive in regard to the respondents to adopt certain viewpoints. The researcher should not stress certain aspects of the interview. To improve reliability the researcher asked all interviewees the same questions and ensured that the questions were not ambiguous.

Mertens (1998:181) states that: "...in qualitative research, the credibility test asks if there is a correspondence between the way the respondents actually perceive social constructs and the way the researcher portrays their viewpoints." Verbatim remarks made by the respondents during interviews will be used in chapter four and these were obtained from the transcribed recordings.

Validity

Suen and Ary (1989:157) show that validity is the degree to which a set of data represents what it professes to represent. Validity cannot be absolutely proven. It is the confidence placed in accurate representation of the data collection and analysis by the researcher (Neuman, 2000:274). One can only deduce from indirect evidence that the observed and recorded information is or is not a credible representation of the study.

The question that Leedy (1989:27) poses is: "Can the conclusion drawn from a sample be generalized to other cases?" The remedy to problems of validity can be brought forth by means of a literature review. The researcher agrees with Leedy's question and thus performed a literature review but also realises that this is a limitation of the dissertation in that it is specific to the ICEC. Other environmental centres can learn from this research it does not comment on whether their experiences will be the same as those endured by the ICEC and those centres investigated in chapter two.

3.9 Limitations

The limitations of the study are examined from two different perspectives. The first is those limits placed on the study due to institutional and resource constraints. The second is from the conclusions that are drawn, as mentioned above, from the findings and experiences that are related to the ICEC and those who were instrumental in its development and the users thereof, so although other centres might experience similar problems, their developers and clientele may have different ideas of how to solve them.

In this study, the institutional constraints were minimal as the researcher originally worked for the ICEC and thus the collaborative research entailed evaluation studies which would be for the benefit of the ICEC as well as other environmental education centres.

Resource limitations include time and funds of the researcher, as well as the time taken by the participants to complete the questionnaires and undertake the interviews. The resource limitations imposed on a particular dissertation often reflect the importance of the knowledge development it imparts (Krathwohl, 1998:200). During this study the researcher took the time to ensure that the ICEC was given a fair chance to achieve the goals proposed in the business plan and thus certify that the conclusions and guidelines given in later chapters are of value to others.

Other limits that could have affected the results are that a small sample group was chosen but this was to ensure that those actually involved were interviewed and not a random group whose opinions may not have been based on the true facts.

At the start of the study the researcher worked at the ICEC. This could have resulted in subjectivity on her part, but this was not the case as the first interview was conducted and questionnaires were completed towards the end of her working there. Then to ensure complete objectivity, a second set of interviews and re-evaluation of the ICEC, the programmes it taught and activities it offered was conducted as a whole

to determine how effective it was at educating the community in, about, through and for the environment and thus ensuring sustainability.

3.10 Conclusion

The methodology used to assess the research undertaken by the researcher, namely, the provision of environmental education towards sustainability with reference to the Inner City Enviro Centre in Tshwane has been described in this chapter. Contained within the design and the methodology are descriptions on case study procedures and qualitative research methods such as interviewing, questionnaires and documentation. The selection of the sample and the site were described as well as the methods taken to ensure greater reliability and validity of the information assembled. As with all research, there are certain limitations and those pertaining to this study were examined.

Chapter four explores the results of this research and describes the analysis of the data using the methods described in this chapter.

CHAPTER FOUR

RESEARCH RESULTS AND DISCUSSION

4.1 Introduction

This chapter describes the results of the investigation. The first part includes the case study (4.2) of the ICEC. It portrays the conception, development and activities of the ICEC over a five-year period (1998 – 2003). The expectations of the ICEC as a provider of environmental education towards sustainability, are investigated and the discussion that follows will include the responses of those who were involved. Apart from the document study done, it seeks to reflect the opinions and views of the participants involved in the process of establishment, development and use of the ICEC with regard to the ICEC objectives stipulated in the ICEC Business Plan (1998)

The discussion is thus a compilation of the results from the case study, document analysis and observation compared to the initiatives, methods and operations of those environmental centres mentioned in chapter two. Apart from the above there is also a discussion on the achievement of the objectives of the ICEC as written in the business plan of the ICEC. The information from the comparative analysis will then be used in chapter five to recommend methods and guidelines for others who are developing similar centres within their own environments or communities.

4.2 Results of Case Study

The analysis of qualitative data, and the data collected from the interviews, questionnaires, the document study and other observations, can often cause a quandary as there are no numbers from which to draw a "...more strictly defined analysis" (Fash, 1995:40). However "qualitative data possess a strength unique to themselves" (Fash, 1995:40) and offer a broad perspective that has been given spontaneously, which is very true in the case of this particular research project. Maykut and Morehouse (1994:121) describe the process of qualitative analysis as "fundamentally a non-mathematical analytic procedure that involves examining the meaning of people's words and actions". That is why for this particular study, qualitative research is the best option because the people involved with the ICEC were the ones interviewed and questioned.

4.2.1 Case study

The case study illustrates the information, which has been compiled into the four types of codes recommended by Bogdan and Biklen ((1992:167-172) ex. Krathwohl, 1998:313) namely the strategy codes, the process codes, the activity codes and the event codes. When combined these codes give a true reflection of the development of the ICEC according to the documents analysed and interviews carried out.

Strategy codes:

The development strategy for the ICEC was outlined in the business plan (Appendix 1 – Business Plan of ICEC) which was sent to Pretoria Inner City Partners to obtain the funding. It was a comprehensive report compiled by the members of Le Fase La Rena and the manager of Museum Park at that time. The objectives for the ICEC were stated as follows:

Objective A

"Establishing an operational Green House with the aim to set an example of sustainable living conditions in the inner city, utilizing scarce resources and conserving the city environment" (Inner City Enviro Centre, 1998:1).

Objective B

"Establishing an Urban enviro centre in partnership with all the role players represented in Le Fase La Rena, with programmes relevant to the targeted audiences and similar outreach programmes, establishing further partnership arrangements with other relevant agencies, such as the zoological and botanical gardens; primary and secondary schools; colleges, technicons and universities; City Council of Pretoria (CCP): Culture and Recreation with all its personnel and facilities; public and community forums, clubs and social groups; environmental groups; other local, regional, provincial and national governmental agencies; international NGOs and governmental agencies" (Inner City Enviro Centre, 1998:1).

Objective C

"Establishing an environmental communication and awareness strategy, utilising the resources and expertise of the relevant stakeholders in the GPMA as outlined above" (Inner City Enviro Centre, 1998:1).

Objective D

"Facilitating and focussing existing environmental efforts in the inner city of Pretoria and maximising the impact of such efforts without duplication" (Inner City Enviro Centre, 1998:1).

Objective E

"Promoting the inner city of Pretoria to residents and visitors as an environmentally enlightened city" (Inner City Enviro Centre, 1998:1).

These objectives were designed to meet the environmental education and management needs of those within the community and surrounding environs (Inner City Enviro Centre, 1998:2*).* They were to be the guidelines for the development of the ICEC.

Process, Activity and Event codes:

The 'process codes' described by Bogdan and Biklen ([1992:167-172] ex. Krathwohl, 1998:313) explain the order in which things happened. The researcher has created a time line that explores the development of the ICEC in a clear and defined manner. While describing the developmental sequence of the ICEC, the researcher has also included those activities, which took place on a regular basis (activity codes) and mentioned the once-off projects the ICEC undertook (event codes).

Year 1998

The concept for the ICEC was discussed at a Le Fase La Rena meeting. Present at this meeting was the manager of Museum Park, who liked the idea and knew of a location for the ICEC to be developed (see chapter three – selection of site) as well as of funds, which could be made available. "It was Dr. Duane A. Schlitter from Museum Park and Rina Vogler from Le Fase La Rena who were the driving force behind the establishment of the ICEC" (Interviewee 1, 2001). A joint initiative between Le Fase La Rena and Museum Park was formed (Vogler pers comm, 2005). The development of NGO's, such as Museum Park (of which the ICEC was a subsidiary) are part of the new social movement towards unity and understanding and play a major role in educating for sustainability. They are established within the local community and their role of educating, empowering and capacity building gives citizens the knowledge and power to intervene at the national and global levels. They are in a good position to generate the new forms of social learning necessary for the evolution from the present predicaments to a more sustainable society (Serrano, 2000:98).

Together, members of Le Fase La Rena and the manager of Museum Park drew up the business plan and submitted it to the Pretoria Inner City Partnership to obtain funding.

Year 1999

The year started with the final negotiations between Le Fase La Rena, Museum Park and Pretoria Inner City Partnership being concluded. Museum Park was given the responsibility of legal matters and finances and African Window granted the ICEC use of the house (Interviewee 2, 2001).

The conversion of the old 'Mint Manager's' house into the ICEC began. The construction changes taking place at this time were in accordance with the time frame outlined in the business plan (Inner City Enviro Centre, 1998:7). The use of an existing building was a symbol of sustainability. It was an old and empty building which once renovated was brought "back to life" (Interviewee 4, 2001).

In May, the initial renovations had been completed and the house could be used. It was opened on the 18 May 1999 - National Museum Day. At this time various temporary exhibitions on sustainable living, such as the recycling of tins, plastic and paper, the use of a sun stove and water saving technology were on display. Many schools were invited and more than six hundred children explored the ICEC and surrounding museums (ICEC Minutes,1999:2). During the school holidays the ICEC with other partners held an outreach programme for inner city children (Museum Park Report, 2000:1).

Towards the end of 1999, sustainable technologies including dual flush toilets and aerated showerheads were installed (ICEC Minutes, 2000a:1). More examples were to be installed but they cost money, which wasn't available (Interviewee 4, 2001).

During this year, stakeholder meetings were held and partnerships with other institutions, organizations and businesses were instigated. Pilot environmental education projects were started. The initial marketing of the ICEC was done via brochures to the schools in the Pretoria area and an article in the local newspaper (ICEC Minutes, 1999:2-3).

The management committee was active in this first year, giving many ideas and assistance. It was the job of the manager and educational officer to establish and implement these initiatives. Some of the management committee were focused on specific projects e.g. Interviewee 5 and Interviewee 3 concentrated on the development of the Environmental Awards System for the Youth (EASY) manual.

Year 2000

The ICEC was now fully functional and involved with many projects within the city of Tshwane (a few are mentioned below):

- Environmental Awards System for the Youth (EASY) – The EASY programme was to encourage all learners as well as people within the local communities to become involved in the sustainable development of their environment. It was

started in Pietermaritzburg. The idea of EASY and the EASY manual were adapted from those initiated in Pietermaritzburg to meet the Curriculum 2005 requirements as well as the Tshwane area (EASY Business Plan, 1999:2). Ten schools were piloted in 2000 and due to the success another ten schools were to join the project in 2001 (ICEC Minutes, 2000b:2).

- Puppet theatre project – a project conceptualised to educate and entertain younger children using environmental themes (Inner City Enviro Centre, 2000:1).
- 20/20 National Water Campaign – This project was a governmental initiative which the ICEC became involved in, initially only for National Water Week. Its success resulted in the formation of the Pretoria Water Action group which planned smaller on-going projects with water conservation as a theme.
- Ecotourism action group – this group was established by the ICEC and Museum Park to promote the tourist potential of Tshwane inner city.

At this time, it was realised that some of the rooms within the ICEC were too small to conduct integrated, environmental lessons and so an outside water room was developed where examples of water saving devices were exhibited and related lessons given. The Water Commission sponsored this example of sustainable technology (ICEC Minutes, 2000b). The objectives of this initiative were:

- To *develop* a well researched and tested, user-friendly unit that educators, learners and communities can use for the sustainable and responsible use of water.
- To *empower* and motivate teachers to implement the *National Water Campaign* project at their schools and to participate with their learners in environmental education activities.
- To do *research* on the ongoing development of water saving technology and the education and implementation of the technology (Raath, 2000a).

The rooms within the ICEC were used for exhibitions and small workshops e.g. Ipopeng Art workshops, 'Grace through the Breath' course, teacher training, POPUP

community upliftment workshops, environmental management training courses for members of the Greater Pretoria Metropolitan Council (GPMC) and many others (Museum Park Report, 2000:1,3).

On a marketing front the ICEC was instrumental in the development of a sustainable communities website on behalf of the GPMC. Staff members from the centre attended and were involved in various conferences during 2001 namely: Environmental Education of Southern Africa conference and African Solutions, where the ICEC organised site visits for the delegates (Museum Park Report, 2000:3).

Year 2001

In 2001 the partnership between the ICEC and local governmental departments grew. The ICEC organized environmental health days, assisted in drawing up an environmental educational policy for the TMC (Tshwane Metropolitan Council) and setting up a permanent display within the ICEC (ICEC Minutes, 2001a:1-2).

The Greater Pretoria Metropolitan Council Youth Report, which was initiated in 2000 continued to gain momentum and more schools were getting involved (ICEC Minutes, 2001b:1).

The involvement of the ICEC in the tourism forum was proving to be very successful. Several courses had been conducted and new programmes, such as "Pretoria Kaleidoscope" and "Discover Pretoria" were being developed (ICEC Minutes, 2000b:1-2).

The ICEC continued to market itself by being present at a variety of different shows and exhibitions such as the Pretoria Show and Menlyn Shopping Centre (ICEC Minutes, 2000b:2). It celebrated environmental days with partners and schools either at the ICEC or other venues. This created opportunities for the ICEC and its partners to gain exposure (Raath, 2001:1).

During this year the limitations of the ICEC were starting to become apparent. Its situation within the African Window grounds meant that no recycling projects could be done at the ICEC. The building and room size of the ICEC made it challenging for larger school groups to visit and the educational officer gave programmes in the gardens or at the schools themselves. Projects that were already established e.g. EASY continued to run, but it was stressed that all new projects to be undertaken had to be financially sustainable (ICEC Minutes, 2000b:2).

Museum Park had moved offices into the 'Old Fire Department', next to African Window and adjacent to the ICEC and offered the ICEC the opportunity to relocate. By this time four of the original management committee members had left. Although the objectives for the ICEC remained the same, it was going to align itself more with the activities of Museum Park and a new management structure was to be created (Museum Park Report, 2001:1).

By the end of 2001, only two members of the initial management committee were still involved in projects with the ICEC besides those who were employed by the ICEC (Interview questionnaire, 2001). The initial funding for the ICEC was almost depleted and Museum Park offered to assist the ICEC. The Museum Park management offered guidance and financial assistance although it was stipulated that all projects should be self-sufficient (Interviewee 1, 2001).

Year 2002

The ICEC had now moved and was part of the Museum Park Discovery Centre. It still maintained its identity and continued with environmental and tourism projects as it had done in previous years. The EASY project, funded by Le Fase La Rena continued and the 20 schools were monitored by the ICEC (Museum Park Report. 2002a:2).

During 2002 the ICEC coordinated a variety of projects, the first being a project between the Municipality of Zanzibar and Tshwane Metro (Museum Park Report, 2002a:2). Later on in the year, it joined forces with two universities, the Department of Environmental Affairs and Tourism and Ezemvelo Nature Reserve and coordinated an

environmental project funded by E. Oppenheimer and Son – the Ananzi-Cullinan Project (Museum Park Report, 2002d:2).

Environmental and science education shows were organised for school and community groups (e.g. Voortrekkers) by the ICEC and held in the Discovery Centre. School visits and holiday programmes were held together with the other museums (Museum Park Report, 2002b:2 and Museum Park Report, 2002c:2). Coastal and marine training material was developed and teacher workshops on marine related topics were held in partnership with Delta Environmental Centre (Museum Park Report, 2002e:2).

In June, the manager of the ICEC presented a paper at the Gauteng Summit for Sustainable Development (Museum Park Report, 2002b:2 and 2002c:2). Still involved in sustainable development, the ICEC and Museum Park investigated the possibility of creating a Centre for Alternative Technology as part of the Discovery Centre (Museum Park Report, 2002d:2).

The celebrations of environmental days was still of key importance to the ICEC and a tree planting function was held at Balebogeng Primary School in Mamelodi for Arbor Day. Similarly, for 'Clean up month', the ICEC organized the distribution of more than 10 000 plastic bags to the local schools (Museum Park Report, 2002e:2).

The ICEC continued to strengthen existing partnerships in 2002. It hosted a visit by Julius Smeyers, President of the Belgium organization 'Natuur 2000', who the ICEC manager had met previously on a visit to Belgium. Courses on environmental education, management and sustainability were still being run for the Tshwane Metropolitan Council (Museum Park Minutes, 2002f:2).

Year 2003

Many of the existing activities e.g. school visits, tourism forum meetings, 'Water week' celebrations and EASY continued in 2003.

The ICEC organized and ran two environmental camps at the beginning of 2003. The first was at Ezemvelo Nature Reserve and the second at Madidaba Wildsplaas. There were more than 35 learners participating in the awareness activities planned for the weekend. This was done in partnership with Gauteng North Department of Education and was named the Ananzi-Cullinan project. Later on in the year the success of this project became known and resulted in involvement of a bigger initiative called Kopanang, "Getting together". It involved many role players, Eco-port, Birdlife SA, Pretoria Art Museum, Johannesburg Zoo, the ICEC and was funded by the Oppenheimer Group and the British Development fund. For some of the partners it was very successful and others not. There were difficulties in linking all involved and still meeting the prerequisites set by the funding parties and hence the project was terminated. Another new initiative of 2003 was talks relating to sustainability. These were presented and the idea of forming a Tshwane Environmental Educational Forum established. This group became known as the Local Environmental Education Forum (LEEF) (Museum Park Minutes, 2003c:2).

The strengths of the ICEC were being utilized and site visits for the International Council for Local Environmental Initiatives (ICLEI) delegates were coordinated by the ICEC (Museum Park Report, 2003b:2).

A new partnership between the Department of Labour, the ICEC and a consultant, David Christer, was formed to investigate the possibility of a Centre for Alternative Technology in South Africa, which involved sustainability display units being constructed in the Museum Park Discovery Centre (Museum Park Report, 2003b:2).

The ICEC, Tshwane Environmental Health and Balebogeng Primary school investigated the idea of becoming part of the 'Climate Protection Programme,' which is

a worldwide initiative to monitor aspects of climate change within the local environment (Museum Park Minutes, 2003c:2).

Conclusion of Case Study

The document review of the ICEC revealed how the centre developed, the changes it underwent and the manner in which these changes took place. The process started with the inception of the ICEC in 1998 by Le Fase La Rena, its development in 1999, which was driven by Le Fase La Rena, monitored by Museum Park and funded by PICP. It was during this stage that the ICEC underwent upgrading and retrofitting to make it representative of a sustainable house. The changes were small but illustrated what could be done. Partnerships were created, working groups formed and activities organised. At the end of 2000 the management, functioning and location of the ICEC changed. Even though these changes were made, the goals of the ICEC remained constant and it strived to meet them as best possible.

The regular activities taking place during the period of study were the celebration of environmental days, ICEC management meetings, Museum Park monthly meetings and adult training (e.g. UNISA COLISA courses and others). Other events occurred on an irregular basis e.g. schools visits, learner camps and soirees at the ICEC. During the time of study the ICEC was involved in a variety of projects with various partners. Certain projects were started and continued for the period of the study e.g. EASY and puppet theatre project. Others were completed within 18 months e.g. Greater Pretoria Metropolitan Council Youth Report and still others developed from one project into two e.g. the Anamzi-Cullinan Project and Kopanang. Each project the ICEC was involved in, met certain criteria. It had to operate in accordance with the objectives of the ICEC and it had to be financially independent. It was for this reason that the ICEC was able to achieve its objectives and still be sustainable after six years.

4.3 Discussion of the ICEC objectives

When the ICEC was established its mission was to "contribute to citizens' awareness of the threats to a city, as well as of the conservation of the city - culturally, physically, naturally, politically and economically" for the benefit of all those living in the environment (Inner City Enviro Centre, 1998:1). The goals of the ICEC were to fulfil the five comprehensive objectives stated in the business plan. The manner in which

the ICEC has developed and the projects it has undertaken have been described above. The discussion that follows will focus around the achievement of the five objectives and the opinions of those who were involved with the ICEC. This data will then be compared to information in the literature review (chapter two) and this will then be used to create guidelines for those who embark on similar endeavours (see 5.3).

Le Fase La Rena had many members and represented most of the environmental education organisations, institutions and individuals in Tshwane (Inner City Enviro Centre, 1998:1). It was in collaboration with these members and the manager of Museum Park that the objectives were drawn up (Interviewee 6, 2001).

The development of the ICEC was initiated once the funding was granted in accordance with the mission and goals set out in the business plan. All those involved agreed upon a common goal - provide environmental education towards sustainability focusing on the urban environment – develop "urban sustainable development projects" (Interviewee 7, 2001). Depending on their involvement with Le Fase La Rena and their own background, they did have a variety of reasons for the development of the ICEC:

- Provide an "example of a sustainable house" (Interviewee 2, 2001)
- Get the "youth involved in urban sustainable development projects" (Interviewee 7, 2001)
- Facilitate "administration of the EASY project and set-up an example of a sustainable house in an urban environment" (Interviewee 5, 2001) and
- "Support environmental education activities and infuse environment into all dimensions of city life using Agenda 21" (Interviewee 4, 2001)

In retrospect, some of those interviewed didn't think the implementation of sustainable development concepts at ICEC were realistic (Interviewee 4, 5). Only one was still optimistic, "it was and still is a realistic venture, you have to have good programmes and a marketing strategy – look at the opening" (Interviewee 2, 2001). Interviewee 6 felt that it was a "lack of understanding the vision" and suggested more research

should have been done and creative, cost-effective ideas put into practise and in this way the vision for the ICEC could be successfully implemented.

When asked the same question three years later, some of the opinions had changed. Both Interviewee 1 and Interviewee 4 thought it realistic for the ICEC to provide environmental education towards sustainability focusing on the urban environment but not in a demonstrative manner, rather focussing on facilitation and consultation.

Definition of Environmental Education and sustainability

Following from the above results and from observations made, it was clear that individuals' definitions of environmental education and sustainability could be the reason for the different perceptions in the achievement of the objectives. In chapter two it was recorded that there are numerous definitions for environmental education. When investigating the topic, the researcher realised that it is important to determine what the participants understand by environmental education. In the initial interview, the researcher asked each interviewee to rate the five different dimensions of environmental education namely, the natural, social, cultural, financial and political dimensions. In the second interview, they were asked to define environmental education.

From the responses of both the interviews and questionnaires, the natural aspect was considered the most important and the financial and political the least. The participants differed in their opinion of the importance of the cultural and the social dimensions. Those interviewed rated the cultural as being equal to the social dimension whereas the educators who answered the questionnaires considered the social dimension of environmental education more important than the cultural.

The data from the interviewees is especially relevant from a development point of view. Those involved in the development of the project should have agreed on a general idea or standard definition for environmental education for the ICEC. Most of them agreed that the natural environment was most important; the social and cultural dimensions were on a par and then the financial dimension proved more important than the political according to the interviewees.

The results from the interviews revealed each interviewee's understanding of environmental education and the goals they were working towards, those more involved with the natural environment rated it more highly than those who had a background in cultural history. One participant stated that the natural environment is the basis for all; it provides the physical resources and all the other components use the natural environment equally (Interviewee 5, 2001). This contrasted with the opinion of the cultural historian, who suggested that natural processes can't be changed by humans but the cultural perception of people is what needs to change – the solution to saving our environment is a cultural one, not political (Interviewee 1, 2001). What is significant is that the rating for the social dimension was the most constant. Another interviewee could not rate the importance of each aspect as all were integrated within the city and thus equally important (Interviewee 3, 2001). Together as a team, opinions might differ but the natural, social and cultural dimensions of environmental education would be key. The definition of environmental education quoted most by the candidates in 2004 was that of environmental learning described by O' Donoghue (1993:26; 2001:6)"...is in, for and about the environment."

The all-encompassing definition of environmental education was then covered in the writing of the objectives for the ICEC:

- Objective A focused on sustainability issues (natural and social),
- Objective B stressed the importance of forming strong partnerships (social and cultural),
- Objective C was related to communication (social),
- Objective D suggested investigating EE projects within Tshwane, making them known and not re-inventing the wheel (all aspects of EE),
- Objective E identified the potential of tourists (cultural, social and financial).

The objectives for the ICEC have already been stated (see 4.2.1 Case Study) and were the building blocks for the ICEC, the guidelines for the management committee and the reason the ICEC was given money by the PICP. The interpretation of these objectives and the action taken to achieve each is key to the development of the ICEC. As with any other business or centre, it has to have a mission and goals it

hopes to achieve. The analysis and evaluation of these objectives is crucial to those involved with the ICEC, others starting a similar project and specifically this research project.

Objective A

Objective A is related to the sustainability of the ICEC - the development of the ICEC as an example of a sustainable house, a 'Greenhouse' from which people can learn about sustainability and environmental education and implement ideas within their own community and homes.

The interviewees were asked the following in terms of Objective A: do you feel that the ICEC has met Objective A?

Interviewee 1 understood sustainable development to mean that once started a project must generate its own funds in order to be sustainable but in an environmental or tourism context sustainability is the responsible use of resources to ensure their availability in the future. Interviewee 3 had a similar idea but stressed the importance of financial sustainability. Interviewees 4 and 6 focused on the wise use of resources while interviewee 2 emphasized the balance between conservation and development. Interviewees 5 and 7 believed that sustainability involved a lifestyle that fits in with the carrying capacity of the earth i.e. live within your (the planet's) means but this is done by making informed choices. Although these were all similar the emphasis differed from financial, resource use and education and although they are important, the ICEC needed to focus on those most relevant to its own sustainability (financial sustainability).

From the result of the interviews it can be noted that there definitely was consensus that this objective was not achieved.

There are many possible reasons for this: firstly it was apparent from the interviews that although the objectives were established and that it was agreed that the Centre should be an example of a sustainable house, those involved had different interpretations of sustainable development and what it entailed.

With this in mind, the researcher then asked how the management committee envisaged implementing sustainable development at the ICEC. The ideas included:

- Operate in an environmentally friendly manner (Interviewee 3, 2001)
- Make changes to the physical appearance of the ICEC thus making it a unique example of a 'Greenhouse' (Interviewee 2, 2001). The changes did not have to be expensive – energy efficient lights, alternative energy sources and recycling water
- Have practical examples within the ICEC e.g. drama rooms (Interviewee 2)
- Make physical changes but also educational lessons related to a sustainable lifestyle should be developed (Interviewee 5, 2001)
- "The house should be an example e.g. urban alternative energy sources – solar both passive water heating and solar cells, solar cookers or sun stove. Such as Dieter Holm's house and village in Rustenberg" (Interviewee 5, 2001)
- Demonstrate good water-saving practises by developing a water – catchment mechanism to collect water from roof and gutters and save it to use when watering the garden (a grey water management system)
- Plant water-wise plants, preferably indigenous species. Grow vegetables for food and herbs and flowers to create an attractive garden while keeping the pests away using environmentally-friendly controls (Interviewee 5, 2001)
- Do recycling – have a recycling depot for public and the household including compost to go back to garden (Interviewee 5, 2001)
- Renovation should be sustainable i.e. second-hand furniture and using alternative tools or substances.
- Interviewee 6 recommended that the sustainability didn't only have to focus on the house but could include the garden and the city and display examples of natural and urban environments in harmony e.g. Centre for Alternative Technology (CAT) - United Kingdom, Potter's Earthship, Delta Environmental Centre and Umgeni Valley Education Centre (described in chapter two)

Most of these suggestions were feasible, except for the recycling as the landlord would not allow recycling of any sort to take place on the property (Interviewee 5, 2001). Initially the ICEC was retrofitted with energy and water saving devices and all conventional light bulbs were replaced with energy saving globes. Programmes were developed to teach the youth the importance of living in a more sustainable manner and how they could go about it. These programmes weren't well utilised by the schools. The ICEC later moved from the premises of the African Window to those of Museum Park, namely the 'old Fire Station'. Again the building was being revamped as an example of sustainability but it didn't show any signs of retrofitting and no plans were in place to do so. A major advantage for the ICEC was that the new location was larger and could accommodate many more people. Many of the programmes developed could be presented or facilitated more easily e.g. those lessons related to the conservation of water using the equipment from the water room could be reused but some were archived as certain facilities were no longer available e.g. the garden. When the educators involved with the EASY project were asked to complete the questionnaire, sustainable development programmes were rated the third least important along with biodiversity. This could be due to the fact that most of the candidates were primary school educators and sustainable development is a topic better suited to an older audience.

For young children the concept of caring for the environment is meaningful only when they can see the direct result of their actions. They can understand the consequence of littering as it results in an unsightly area and requires someone to pick up the litter. Wasting food means that food is not available for them or anyone else to eat. Children can also see the uselessness of wasted paper, carelessly broken toys and water down the drain. The concept of energy saving is much more abstract. Young children will need to learn energy conserving practices, such as turning off lights, simply as habits (Dighe, 1993:62). Water was the programme that most educators wanted to learn about and teach the children about and this is reiterated in the success and sustainability of the Water Week celebrations and programmes.

Objective B

The formation of partnerships is vital to the success of a project. Those involved in writing the objectives realised this and partnerships formed the focus of Objective B -

"establishing an urban enviro centre in partnership..." It was reiterated in an international survey done by Young (2000:173) at the seventh session of the Commission on Sustainable Development where she found "that there were no outstanding organisational mechanisms that could be identified as being singularly effective for education in the sustainable development process and it could thus be concluded that a balanced approach and the co-ordination of all organisational mechanisms were perceived to be favoured as options." The same survey also indicated that action could not be initiated singularly but needed the initiative and co-operation between local, national, regional and international levels (Young, 2000:175). These words by Young compare favourably with those of Objective B – the ICEC was to form partnerships with all role-players in the community including government, NGO's, places of learning, citizens, museums, businesses etc.

When the interviewees were asked if this objective was achieved the opinions of the interviewees was neutral both in 2001 and 2004, implying that it was partially achieved. Although the overall opinions remained unchanged over the period of study, individual opinions did reflect a change.

The ICEC formed strong partnerships (Interviewee 4, 2001). It was the partnership between Museum Park, Le Fase La Rena and PICP that resulted in the establishment of the ICEC and it continued to form new partners as it embarked on new projects. It formed partnerships with local government namely the Tshwane Metropolitan Council, Department of Environmental Affairs and Tourism, Department of Water Affairs and Forestry, Gauteng Department of Education; other environmental agencies; the Pretoria National Zoological and Botanical gardens; museums and businesses such as the Plastic Federation and Rand Water.

As the ICEC had a variety of different partners, the researcher divided them into five groups and asked the interviewees to rate the partnership between the ICEC and the group.

- Group 1 – Museums

Did the ICEC form a good working partnership with them?

The ICEC increased the vision of Museum Park by collaborating with the other museums creating an "umbrella feeling", thus schools not only visited Transvaal Museum but also African Window and the ICEC (Interviewee 1, 2001). This partnership worked well but it sometimes resulted in the exclusion of other partners (Interviewee 6, 2001).

- Group 2 - Schools

Small inroads were made in establishing relationships with schools – initially using the EASY project but this remains one of the ICEC's biggest challenges (Interviewee 1, 2001). From the interviews it was noted that this partnership was not successful although the interviewees showed that they believed the relationship between the schools and the ICEC improved slightly from 2001 to 2004. Having schools as partners is a promising venture especially for the development of environmental educators – both teachers and natural resource professionals (Bainer *et al.,* 2000:37). Interviewee 7 (2001) agreed that the ICEC had been of benefit for the educators but not always for the learners.

Interviewee 4 was of the opinion that the objective should have been divided into two categories: partnerships and programmes. The researcher noted this and hence included comments relating to programme development. Objective B also includes the development of learning programmes to meet the needs of the community as well as the partners. Research shows that increased awareness and knowledge of environmental action strategies contribute to increased motivation to take action (Palmberg and Kuru, 2000:35). Programmes were developed but lack of interest from the schools resulted in reduced funds to develop more programmes (Interviewee 4, 2001). This issue is discussed in more detail under objective D.

- Group 3 – Local government

The general opinion of those interviewed was that the local government and the ICEC worked well together and the partnership got better over the years. This is confirmed by the information gathered during the case study (see 4.2.1 Case Study – Year 2000 - 2001) where it was reported how well the different departments within local government used the ICEC. The ICEC became part of the environmental / sustainable division of the GPMC – the ICEC organised focus group meetings, helped create the

sustainable communities website and did employee training for the GMPC. Interviewee 4 noted how "handy" it was for GPMC and later TMC to use the ICEC as part of their strategies for planning, policy-making and training.

- Group 4 – Business and industry

This was one of the least successful partnerships of the ICEC and according to the interviewees, didn't improve over the period of study. It was actually perceived to be worse in 2004 than in 2001.

Once the ICEC had been established, it was necessary to get input from local businesses and a local businessman was asked to become a member of the management committee (ICEC Minutes, 1999:1). It was a good idea but he didn't attend any of the meetings (ICEC Minutes, 2000b:1) and thus a new method of introducing the ICEC to businesses and industry needed to be conceptualised but as can be seen from the results, it either wasn't done or was not done effectively.

- Group 5 - Residents

The interviewees thought that this was the least successful partnership. This could be due to the fact that there weren't many residential buildings close to the ICEC, that the ICEC didn't make enough of an impact in the area to make a difference in their lives or it appealed to or targeted a different market to those living in the vicinity to utilise it easily. It was the opinion of Interviewee 6 that the reason for the poor relationship between the local community and the ICEC was that the ICEC had many partners and some were better established and maintained than others.

Conclusion

In the ICEC Annual Report (ICEC Report, 2000b:7), it was written that the ICEC was successfully developing healthy, working partnerships but by 2001 when candidates were interviewed for the first time, problems in terms of partnerships and communication (Objective C) were evident. Some of those interviewed felt it difficult to comment on the question due to the lack of information given to them over the years (Interviewee 2, 5, 6). Although having been involved in the beginning, they were not kept abreast with the happenings at the ICEC, "not enough feedback" was given and thus they became one of the under-utilised partners.

The ICEC was developed to be used by "all citizens" in Tshwane. The target market envisioned by those interviewed differed but together they included everyone in the community: the "youth," "schools," "learners," "urban community," "official community - the local government" and "businesses". This difference of opinions within the management committee initially resulted in a broad base from which to develop and create partnerships as can been seen in the business plan. It was later that the differences and lack of communication resulted in some members choosing to get involved in other projects due to "objective differences" (Interviewee 7, 2005) and "lost contact" (Interviewee 2, 2005).

Objective C

If Objective C was achieved it would answer in the affirmative the following question: Was an environmental communication and awareness strategy designed utilising the resources and expertise of the relevant stakeholders in the GPMA and later the TMC? The results from the question as to whether the interviewees were of the opinion that Objective C had been met was slightly positive until 2001 and a little less so in 2004 and thus this area still needs to be worked on.

Interviewee 4 (2004) commented that although an environmental strategy had been developed with local government in 2000 the TMC's interest had started to decline after that. It was renewed, in light of the Earth Summit that was held in Johannesburg in 2002. The environmental strategy developed by the ICEC for the TMC was well constructed but the implementation needed to be marketed. Together the ICEC and the TMC needed to make the environmental plan for the city available to those who were interested. For those not interested, a tangible benefit for them to want to learn about and implement the plan needed to be created. This objective ideally implies that the ICEC, together with the help of the TMC, should have informed (knowledge), influenced (attitudes, establish a positive value system) and empowered (teach skills) those using it. The ICEC did achieve this on a small scale by holding workshops on environmental issues such as air pollution, waste management and environmental health for representatives of the TMC (Interviewee 4, 2004).

Objective D

Environmental education is something that is important to each of us and hence "a great deal of time and energy has gone into creating fields of research and curriculum development that communicate important ecological principles and skills" (Klein and Merritt, 1994:15). The purpose of Objective D was for the ICEC to facilitate and advertise existing environmental efforts in the inner city of Tshwane and prevent 'the wheel from being re-invented' with the initiation of new projects if similar ideas already existed.

When asked if the ICEC had met the criteria of this objective the opinions of the interviewees indicated that the ICEC had taken some small steps to achieve the objective of environmental education (see Case Study for examples – *Year 1999-2001*) but over the years it seemed that instead of not 'reinventing the wheel' the ICEC did initiate projects similar to those in existence.

As the ICEC developed and partners changed, some of the projects which were successful in 1999, lost popularity and interest in them diminished. They were later recreated under another auspice or closed. EASY was unable to obtain funding in 2003 and those schools involved should have been offered the opportunity to become Eco-Schools – a programme developed as a schools improvement programme that aims at achieving sustainable environmental management. The Eco-Schools project is linked to the action plan outlined in the Millennium Declaration signed at the 2002 World Summit on Sustainable Development (wco-schools.org/countries/pages/page_rsa.htm:1) Due to a lack of communication and enthusiasm the schools lost interest (Interviewee 6, 2005, pers comm). Another environmental education forum was initiated - Tshwane Environmental Education Forum - LEEF (Museum Park Report, 2003a:2) which had similar ideas to Le Fase La Rena.

One of the reasons that this goal wasn't fully achieved is that there was no "snow balling effect" of the projects initiated that might have made them self-sufficient and sustainable, due to the fact that the information related to the goings-on at the ICEC

and other environmental projects in the city were not distributed to those interested in environmental education (Interviewee 5, 2001).

Objective E

Objective E relates to the tourism potential of the City of Tshwane and the ICEC's capability to increase it. The question that this objective raises is what is 'an environmentally enlightened city'?

The inner city has many tourist attractions, the Union Buildings, Church Square, a number of museums and art galleries but does the city itself attract tourists?

On the basis of the responses from those interviewed it appeared that the ICEC had started to achieve this goal towards the end of 2001 and as time went by the influence of the ICEC increased. For tourism to be sustainable it has to operate within the natural capacities for the regeneration and future productivity of natural resources. Tourism authorities should recognise the contribution that people and communities, customs and lifestyles, make to the tourism experience and accept that these people must have an equitable share in the economic benefits of tourism and should be guided by the wishes of the local people and communities in the host area (Hanneberg, 1994:5). The ICEC ran 'green tourism' courses for members of the community, students and municipal workers to educate them on various aspects of the city and how to promote it as 'an environmentally enlightened city' (see Case study - examples included – Ecotourism action group, site visits for the African Solution Conference delegates, Kaleidoscope and Discover Pretoria initiatives).

Conclusion on discussion of objectives

The ICEC strived to achieve all the objectives set out in the business plan. Over the five years it was most successful in establishing partnerships and developing an environmental strategy with the TMC. It did not manage to create an operational 'Greenhouse' to be an example of sustainable living conditions in the inner city, utilizing scarce resources and conserving the city environment. The other two objectives, namely facilitating and focussing existing environmental efforts and

promoting the inner city to residents and visitors as an environmentally enlightened city were partially achieved. These results were the opinions of those interviewed.

The objectives were written in 1998 before the ICEC was developed and although the focus of the ICEC changed, these objectives were not re-addressed and adapted to meet the changes taking place at the ICEC, with the partners, in local government and within the city.

4.4 Discussion of the data from questionnaires given to educators and interviews with relevant stakeholders

While conducting the first interviews in 2001 the researcher realised that there was a question that had not been considered. This was then asked in 2004 namely: What sort of market research was done to determine the needs of the educators, learners and community before the ICEC was established? Most if those interviewed said none, although Interviewee 6 (2004) said that there was a need from an environmental education organisation aspect namely Le fase La Rena and Interviewee 2 said that no formal research was undertaken but those involved relied on the experiences of those participating in the process and workshops.

In the interim (between 2001-2004), the researcher asked some teachers who had been involved with the EASY project to complete a questionnaire (market research) in which they were asked to rate those environmental topics they thought most important to them and their teaching and also how they would teach certain topics. Some of these results have been revealed earlier in this chapter (*Objective A* - p 67) but it is interesting to note they rated the given topics as follows:

TABLE 2: ENVIRONMENTAL EDUCATION TOPICS (1 – MOST IMPORTANT AND 15 – LEAST IMPORTANT)

1	Water
2	Natural environment
3	Plants
4	Permeaculture
5	Soil

6	Animals
7	Disease
8	Crime
9	Energy conservation
10	Social environment
11	Biodiversity
12	Sustainable development
13	Economic environment
14	Insects
15	Population dynamics

The educators were also given seven different lessons according to the specific learning areas e.g.

- Natural sciences (NS) – the water cycle
- Mathematics (Maths) – fractions
- Social sciences (SS) - Nelson Mandela

All the lessons used the environment as a theme. The educators were asked to list which teaching methods they would choose to teach it. Practical examples was expressed as the favourite method of teaching: examples include: experiments with water measuring the amount of rain which had fallen; measuring the evaporation and this then being used to explain the water cycle. Or, bring oranges to schools and getting into groups and dividing the oranges into pieces as a lesson to explain fractions. The least chosen teaching method was excursions, the reasons were not mentioned but the researcher suggests the costs involved would be a factor.

The researcher lastly asked what factors influenced their decisions when choosing to go on excursions (1 – most important – 6 least important);

TABLE 3: FACTORS TO BE CONSIDERED WHEN CHOOSING AN EXCURSION DESTINATION

Factors	Rating
Good education programmes	2
Connection with curriculum	3
A brochure	4
A previous visit	4
Cost	4
Locality	4
Recommendation	6

It can be seen that good environmental programmes are imperative, followed by their connection to the curriculum. The other factors mentioned are on a par, except for recommendation, which scored the least.

Having all this information now gives the ICEC a better indication of what is important and shows how essential market research is. The researcher only gave questionnaires to educators involved in projects with the ICEC but other questionnaires should be drawn up to establish the opinions and needs of the other stakeholders of the ICEC.

Another area the researcher highlighted in the second interview and not as much in the first was tourism. The ICEC has extended its scope to include tourism, i.e. it ran courses and offered tours for both local and foreign visitors. The researcher then asked those interviewed their opinion of this development? There was consensus that this move was made to finance the ICEC as the initial funding had run out and that is was a lucrative option (Interviewee 1, 2001). The other positive aspects included marketing the city (Interviewee 3 and 5, 2001). This created environmental awareness (Interviewee 3, 2001) and increased the target market of the ICEC and allowed the ICEC to educate adults about environmental issues which is usually more difficult than educating children (Interviewee 1, 2001). Those who objected cited the following reasons: education and marketing are not the same thing (Interviewee 5, 2001) and that it was an easy way to obtain funding (Interviewee 7, 2001). Interviewee 5 objected that if the ICEC had achieved Objective A, then it too would be a tourist attraction and thus market itself and not only other attractions within the city (Interviewee 5, 2001).

Both Interviewee 2 and 6 suggested that it was a good idea for the ICEC to broaden its scope but that it didn't have the capacity and resources to fulfil its already stated objectives and then focus so wholly on this particular one.

In the second interview, the researcher also mentioned the other centres in South Africa that she had investigated during the literature review (see chapter two) and asked those interviewed to compare the development and objectives of the ICEC to some of those centres (Appendix 3 – Question 14, Interview framework 2004). The results showed that the interviewees found it difficult to compare because the ICEC was not subsidised by the government or by businesses (Interviewee 5, 2004) and its objectives and focus was different (Interviewee 2, 6). Although these answers were true the researcher managed to find many comparisons, whether favourable or unfavourable, for the ICEC and the researcher has highlighted these as areas of improvement in chapter five.

4.5 Conclusion

The initial objectives of the ICEC formed the basis on which it was established. The objectives have been reviewed and scrutinised by those involved in the process. It can be seen that the evaluation and effectiveness of implementing these objectives was crucial to the development of the ICEC but taking into consideration all the variables determining the feasibility of programmes or projects and the changes that have occurred, these objectives should be used as guidelines and expanded and adapted to best suit the needs of the community and make the ICEC sustainable.

CHAPTER FIVE

CONCLUSIONS AND GUIDELINES

5.1 Introduction

In this final chapter the researcher summarises the findings of chapter four. These findings are then compared to those in chapter two and used to create a strategy, which can be used when developing a sustainable environmental centre. The information compiled will be a combination of theoretical knowledge (from the literature review) and practical experience (case study). The data will not only pertain to the development of new projects but also the changes that can be made to existing projects. This chapter also suggests ideas for further research in this field and outlines the limitations of this investigation.

5.2 Findings

The three key areas of the ICEC that the researcher investigated was the ideas to encourage sustainable living; the tools used to provide environmental education and to ascertain which projects worked and why, and examine why some did not succeed. This was done using the objectives of the study as a backdrop. A number of different environmental centres were discussed in chapter two, and in chapter four the outcomes of these discussions resulted in the following findings and recommendations.

5.2.1 Objective A – Sustainable Urban Environmental Centre

Objective A focused on sustainability issues (natural and social) and in chapter two and chapter four a number of different urban 'Greenhouses' were discussed. The differences between those 'Greenhouses' and the ICEC, as well as their strong points will be highlighted especially in view of the fact that this particular objective was not achieved by the ICEC.

The first was the 'Ecohouse' (2.2.5.1a), which is an example of a sustainable house. This project is helped by Environ, a trust that secures funding for it from a variety of sources. The trust is able to do this because 'Ecohouse' is world-renowned and thus a

worthy cause to support. When establishing the ICEC, those involved were striving for this but the house had to be completely retrofitted (energy saving globes, dual flush toilets, solar power, recycling bins etc.) before it could be promoted as an urban 'Greenhouse' and complete retrofitment never took place. For this reason, it could never be marketed as such even though it ran courses relating to sustainability. The ICEC had the potential to become the 'Ecohouse' of Tshwane but due to restrictions e.g. (no outside recycling bins on the property) and the usage of funds for other projects, it never did. If it had, it too could have outsourced the funding and management of its funds to a company specialising in this and focused purely on environmental education and education for sustainable living.

The GreenHouse Project (2.2.5.1b) received funding to do an initial feasibility study. This idea has proven to work because by doing the market research before initiating the project, the GreenHouse knew what the community needed, what gaps there were in the market and developed the GreenHouse to fill the gaps and also provide much more. Interviewee 2 mentioned that the GreenHouse had the same principles as the ICEC but that it was a bigger project with more opportunities as it had more funding and facilities. The objectives of the ICEC could have been better achieved if they had been broken down further in sub-objectives with time frames, team co-ordinators and financial needs. This was done for the development of learning programmes but not for objective A.

When reviewing urban 'greenhouses' the researcher noted that even though a project may have many resources and was created with design expertise (e.g. Earth Centre, U.K – 2.2.5.1c), when the time came for it to be financially independent it was unable to do so. It needed additional funding and this considered, it is remarkable that the ICEC has managed to be independent and survive. The researcher believes that this is due to the fact that it adopted a policy on only getting involved in self-sufficient projects and it got financial assistance from Museum Park in tough times (Interview 1, 5, 2004).

The Centre for Alternative Technology (CAT – 2.2.5.1d) in the United Kingdom was mentioned as it gives the ICEC and other centres like it something to strive for,

especially as some research into alternative technology has already been done at the ICEC. Potter's Earthship or Turtle School (Canada – 2.2.5.1e) and Oberlin College (2.2.5.1f) in Ohio were also mentioned for the tangible ideas such as wave power displays, carbon fitness check, buildings using cans and tyres, organic gardens etc. that could be used at a centre where sustainability is trying to be achieved.

The ICEC was to be unique, an example of a sustainable house within an Inner City providing environmental education to the community. There are other urban environmental centres in existence e.g. Delta Environmental Centre in Johannesburg, Centre for conservation education in Cape Town, Brisbane Urban Environmental Education Centre, Urban Environmental Education Resource Centre in Detroit (chapter two) but these centres focus on providing all aspects of environmental education not only urban environmental education.

5.2.2 Objective B – Partnerships (and Programmes)

Objective B of the ICEC was to form partnerships and as mentioned above, some of those worked well namely the museums and local government, others still needed to improve and the Centre for Conservation Education (2.2.5.2b) in Cape Town gives an example of how to actively get schools involved. It is staffed by the Western Cape Department of Education. When the researcher asked if this option was ever considered for the ICEC the answer was negative. Some members of the Gauteng Department of Education (GDE) work at the Mamelodi Environmental Centre and enjoy doing so as they have a clear understanding of what it is they are working towards (Interviewee 6, 2005). If the ICEC had maintained a working partnership with the GDE this could have been a viable option and its programmes would be aligned with the National curriculum statement.

The GreenHouse developed a partners and friendship base (volunteers). These people offered their time and knowledge and also supported the endeavours of the GreenHouse. The ICEC did have partners and although people did offer their time and knowledge, an ardent group of volunteers was not created or used. The researcher got the impression from those that participated in the interview that they offered their

services on numerous occasions but due to the lack of response from the ICEC, they got involved in other projects (Interviewee 2, 6, 7).

The Delta Environmental Centre (2.2.5.2a) has similar goals to the ICEC (Interviewee 2, 6) but it does not have the sustainability dimension (Interviewee 7). It has a core body of environmental educators who are asked to facilitate when needed. It also has strong partnerships with Rand Water and Alpha Limited who provide resources including funding. Although the ICEC developed strong partnerships such as those with the museums and local government, other partnerships were weak or non-existent – business, other NGO's and the local Department of Education.

It can learn from the Delta Environmental Centre in terms of forming partners with businesses. Instead of looking for funding from government, international agencies and local supporters, the ICEC could take the initiative and ask businesses to fund certain projects. This idea was mentioned in minutes (ICEC Minutes, 2000b:1) but it related to certain rooms within the ICEC. The researcher believes that instead of asking business to fund the development of 'rooms' related to their enterprises, they could be asked to fund projects e.g. African Bank supporting a local sustainability skills development programme that includes topics such as permaculture, entrepreneurship and safety in your environment. Doc Shongwe (1997:57-58) attributed the success of Delta Environmental Centre to its staff and dynamic approach to assessing and reviewing its objectives and ensuring that they remain relevant to today's changing times. Although the ICEC might have done this, there are no formal records of assessment and adaptation besides this research project.

The Brisbane Urban Environmental Education Centre (2.2.5.2c) offers programmes similar to those of the ICEC but based within a school environment. Due to its success it is growing and going to create a visitor centre and a 'model' of urban living projects which is similar to objective A of the ICEC. Even though the ICEC has changed its focus, it too could be similar to the Brisbane Urban Environmental Education Centre. It needed to first establish itself proficient in certain areas before obtaining further funding to expand and achieve all its objectives.

5.2.3 Objective C – Communication and Environmental Policies

When assessing the achievement of Objectives C the researcher investigated the following centres to see what methods they used and then compared them to those used at the ICEC.

The Alam Bandar Centre (2.2.5.3a) in Malaysia trained not only local authority personnel but also community 'urbanites', thus ensuring that the government employees are efficient at their jobs and that the community members were aware that they also had a role to play. In the beginning the ICEC was involved in such projects with the local government especially those concerning public participation but when the government was reshuffled (2001-2002) it experienced a slump in this relationship but this is presently being renewed (Interviewee 5, 2004). The ICEC could investigate how this centre in Malaysia communicates and encourages the locals to get involved, as this appears to be a stumbling block for the ICEC.

The Parivesh Centre (2.2.5.3b) in India works in a similar manner as the Alam Bandar Centre but its strength lies in the partnerships it forms. This just reiterates the importance of partnerships for the ICEC. It also has a future five-year plan which is used to encourage growth and secure funding. This is what the ICEC needs to do – even if the funding isn't available at present, it needs to set aims and couple them with a time frame of achievement.

In China the Environmental Education and Communication Centre (2.2.5.3c) of Tianjin is similar in size to the ICEC and hence capacity could also be a contributing factor to the lack of funds available as this centre also ran short of money. This Chinese Centre disseminates its information differently to the ICEC. It uses film as a method of dissemination. This is not an option the ICEC has considered but if explored, has the opportunity to open doors for the ICEC e.g. forming partnerships with production companies and the possibility of greater exposure for sponsors.

5.2.4 Objective D – Complementing existing environmental projects and environmental education

The ICEC was never meant to be a wildlife centre or nature reserve and hence cannot be compared to projects or centres such as the Kortright Centre for Conservation (2.2.5.4b) or the Everdale Environmental Learning Centre (2.2.5.4c) abroad or even locally with the Umgeni Valley Education Centre (2.2.5.4d) or the Graskop Environmental Centre (2.2.5.4e). The reason the researcher mentioned these centres is that they have similar programmes to those offered by the ICEC although those at the ICEC have been adapted to suit the urban environment. Another reason the researcher has included them is that when schools are deciding on excursions for the learners, the candidates interviewed said that good programmes were essential and if a centre such as Graskop Environmental Centre offered good programmes as well as an outdoor conservation experience, it would be more beneficial for the learners to go there to learn from practical examples in a new environment compared to learning in an environment which is similar to their home or classroom.

One of the opportunities that the ICEC had but did not use was to become an Eco-school. The Treasure Beach Environmental Centre (2.2.5.5a) converted to an Eco-school so that it could become an example for schools to use. The researcher reasons that becoming an Eco-school fitted in with the objectives and activities of the ICEC and it wouldn't have been more work, but would have motivated those schools interested in becoming Eco-schools to contact or visit the ICEC.

5.2.5 Objective E – Tshwane Tourism and Pretoria Inner City Promotion

The trend to move businesses away from the city centre and into the suburbs or city margins resulted in the inner city deterioration.

The Urban Education Resource Centre (2.2.5.2d) was established for similar reasons to the ICEC – urban renewal. It has schools as partners and together they do environmental monitoring using modern resources. The ICEC is working on a similar project with Balebogeng, namely the 'Clean Air Project', where the school uses available equipment from the ICEC to monitor air pollution in their environment.

Unfortunately for the ICEC, the learners don't need to come to the ICEC to use the equipment so although the project is worthy, it cannot fulfil the role of urban renewal for Tshwane (Interviewee 5, 2004).

The ICEC was to be an attraction, similar to the museums or the GreenHouse Project – it was to attract locals and tourists back into the heart of the city. This objective opened the door for the ICEC to change its focus instead of becoming a destination itself, it promoted other destinations within the city – it didn't become the Inner City Environmental Centre, it became the Inner City Tourist Information Centre specialising in environmental information.

5.3 Guidelines

One of the aims of this study was to create guidelines for the development of other centres or projects so that they can learn from the case study of the ICEC. The following guidelines have been divided into four sections that could be used:

5.3.1 Marketing

1. Do market research before embarking on any project.
2. Develop a centre (or proposal) that is user-friendly and inviting.
3. Market the centre according to the needs of the community (in agreement with the research conducted).
4. Partners and friends can be the best marketers; treat them with respect and communicate with them regularly.
5. Have a product or project that is well thought-out and useful.

5.3.2 Operations and Management

1. Have clear and achievable objectives for each project.
2. Ensure each project is sustainable (costs and time allocated)
3. Create a working document as a management plan allowing it to change and grow according to the development of the project.
4. Be transparent and share all relevant information with interested parties, get 'buy-in' and encourage involvement.

5. Outline clear job titles and duties to ensure that those employed can be held accountable, accept responsibility and take ownership.

5.3.3 Finances

1. Draw up a comprehensive budget for each project and ensure that it is adhered to.
2. When obtaining funding, sponsors should insist that only a certain percentage goes towards administration.

5.3.4 Educational policies

1. Align all programmes with the curriculum but at the same time do not only offer topics or lessons that can easily be achieved in the classroom.
2. Develop programmes using innovative resources and creative ideas.
3. Programme development must include material that necessitates a pre-visit by educators. It should be practical and interactive and offer extension opportunities and can be completed back in the school environment.

By using these guidelines, the sustainability of the project should be improved. These are suggestions which the researcher has formulated from the data collected and they can be used to develop a successful environmental centre by trying to solve problems before they arise and give useful solutions to those that an existing centre may already be experiencing.

5.4 Recommendations for further study

While conducting this research it was found that this field of research has many opportunities for further study. Three that relate directly to this research would be to firstly conduct a comparative study into the different centres or museums providing environmental education in the Tshwane area e.g. the Transvaal Museum, the Botanical Gardens, the Zoological Gardens, the Environmental Centre in Tshwane, the ICEC and any others – comparing them using the above guidelines as a basis. The second would be to determine what it is educators are looking for when going on excursions, the reasons for excursions and the factors that influence where it is they decide to go. The distribution and usage of funding and donated money could be a

title for a third research project. This project could outline factors the sponsors are looking for when allocating funding, what makes them choose one proposal over another, what are the terms and conditions of the grants and what type or form of feedback is expected.

5.5 Limitations of studies

The researcher realised that this particular study was hindered by certain limitations. One limitation was the small sample size of predetermined candidates especially for the interviews (this has been previously mentioned).

The duration of the research project was both a positive and a negative factor, the positive being it allowed for change to take place and development to continue, the negative was certain candidates were not available for a second interview due to death or illness.

When investigating the different environmental centres throughout the world, the researcher noticed that just as there are numerous definitions of environmental education and education for sustainability, there is a wide variety of centres known as 'environmental education centres', each with its own goals, objectives and survival strategies. The centres analysed for the purpose of this dissertation, are comparable to the ICEC; no museums, aquariums or zoos have been included in this study.

These limitations were noted and all possible precautions were taken to try and reduce their impact on the study. It is for this reason that document analysis, as well as interviews and questionnaires were used.

5.6 Summary

In this chapter the findings from both chapter two and chapter four have been summarised. The matters and challenges that the ICEC and other centres faced have been highlighted and with these in mind, recommendations for the establishment of other centres or projects compiled.

This research is a microcosm of informal environmental education and education for sustainability outside the classroom. It has emphasised some of the issues that

educators, community members, learners, government and businesses are facing. The ICEC has been used as a model for this particular project. Although the development of it was not perfect, it is from both the successes and challenges that the ICEC has faced that other centres can learn, improve and do it better.

We only have one earth and it is important that each of us has the knowledge, attitudes and skills to guard and protect it to the best of our ability.

Each time an individual fixes a leaking tap thus saving water, plants a tree, buys organic food or conserves electricity by switching off the lights when going out for the evening, he or she is facilitating an attitude change of the human race towards ecological integrity (Visser and Sunter, 2002:189). Environmental education and education for sustainability are not only concerned with ecological practises - social issues are just as important. And thus, each campaign against human rights abuses, fair trade regulations and even joining a neighbourhood watch will take us closer to achieving social harmony. "Individuals do make a difference, little things do count" (Visser and Sunter, 2002:189).

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Appendices

Appendix 1 – Business Plan of ICEC

Local Initiatives Awards

BUSINESS PLAN FOR A HOLISTIC URBAN ENVIRO CENTRE IN THE PRETORIA CITY CENTRE

EXECUTIVE SUMMARY

Environmental education is a very broad concept and practised in a variety of contexts, regions, venues and from different points of departure. Very little, however, has been done for environmental education in inner city contexts, both in South Africa and internationally. The need for environmental education in urban areas are obvious: environmental problems such as pollution, health deprivation, littering, et cetera exist as well as social problems such as conflict, marital instability, poverty and educational problems, etc. The inner city provides an environment to all who resides in the inner city. It is each person's basic right to have a healthy environment, but many of the inner city residents are deprived of this right.

In this business plan we suggest an Urban enviro centre which can contribute to citizens' awareness of the threats to a city, as well as of the conservation of the city - culturally, physically, naturally, politically and economically. Since the information to do this comes from **a variety of sources** in the inner city in Pretoria, the proposed urban environmental centre is an ideal venue to provide a service to enlighten its citizens over a broad spectrum, but also to contribute to the conservation of the city to the benefit of all its citizens.

Many service providers in the inner city offer a wealth of information about various sectors of life, but a holistic plan relating to programmes for the urban environment is still lacking. This initiative has been initiated by Le Fase La Rena, a facilitative body for environmental education in Pretoria. Le Fase La Rena has facilitated and negotiated funding for the project and established a representative management committee. Most of the important environmental education organisations, institutions and individuals in Pretoria are represented on Le Fase Le Rena.

Objectives with the establishment of a holistic Urban enviro centre

A. Establishing an operational *Green House* with the aim to set an example of sustainable living conditions in the inner city, utilizing scarce resources and conserving the city environment.
B. Establishing an Urban enviro centre in partnership with all the role players represented in Le Fase La Rena, with programmes relevant to the targeted audiences and similar outreach programmes, Establishing further partnership arrangements with other relevant agencies, such as the zoological and botanical gardens; primary and secondary schools; colleges, technikons and universities; City Council of Pretoria (CCP): Culture and Recreation with all its personnel and facilities; public and community forums, clubs and social groups; environmental groups; other local, regional, provincial and national governmental agencies; international NGOs and governmental agencies.

C. Establishing an environmental communication and awareness strategy, utilising the resources and expertise of the relevant stakeholders in the GPMA as outlined above.
D. Facilitating and focussing existing environmental efforts in the inner city of Pretoria and maximising the impact of such efforts without duplication.
E. Promoting the inner city of Pretoria to residents and visitors as an environmentally enlightened city.

Funding

An amount of R275 000 has been made available by the Pretoria Metropolitan Area through the Pretoria Inner City Project (PICP) for the Urban Environmental Education Project which has to be established by means of a partnership. The Museum Park Board is requested to manage this amount for the Urban enviro centre. Future funding will be negotiated with the Pretoria Inner City Partnership, as well as with other bodies. In order to be sustainable, certain programmes will generate income.

PROJECT DESCRIPTION OF THE HOLISTIC URBAN ENVIRO CENTRE IN THE PRETORIA CITY CENTRE

Reasons for initiating the project

Very little has been done for environmental education in inner city contexts, both in South Africa and internationally. The need for environmental education and management in urban areas is obvious: environmental problems such as pollution, health deprivation, littering, etc, et cetera, as well as social problems such as conflict, marital instability, poverty and educational problems are evident. The inner city provides an environment to all who lives there. It is each person's right to have a healthy environment, but many citizens of the inner city, are deprived of this right.

An Urban enviro centre can contribute to citizens' awareness of the threats to the a city as well as of the conservation of the city - culturally, physically, naturally, politically and economically, Since the information to do exactly this came from **a variety of sources** in the inner city in Pretoria, the Urban Enviro Centre, was seen as an ideal venue to provide a service to enlighten its citizens over a broad spectrum, but also contribute to the conservation of the city to the benefit of all its citizens.

Many service providers in the inner city offer a wealth of information about various sectors of life, but a holistic plan for programmes for the urban environment is still lacking.

A wealth of information is provided by the various museums in Pretoria, but their programmes seldom link to one another. How does ecology, science, culture, et cetera, interconnect specifically to the Pretoria city centre? How can each context benefit from the other. The Urban Enviro centre will attempt to serve a role to link the various museums to one another and utilize their precious resources at the same time. This is one of the aims of environmental education - to provide a holistic interpretation of the environment. Pretoria's environmental role players extend far beyond the museums, however, and this project will attempt to involve them in the execution of their duties (see list of role players involved in Le Fase La Rena).

Lead Partners that initiated the project were Le Fase La Rena and Museum Park.

Le Fase La Rena

Le Fase La Rena is an organisation that succeeded in bringing various environmental stakeholders in Pretoria together and provided a forum and platform for many environmental projects. Through creating partnerships, *Le Fase La Rena* is involved in many environmental education projects. Its broad membership makes it an important role player in environmental matters. It serves as a forum where stakeholders can meet and discuss joint ventures. The environment is its main focus.

In essence *Le Fase La Rena* is a facilitator of role players and projects connected to environmental education in the Pretoria region.

List of role players involved in Le Fase la Rena

The Gauteng Department of Education
Tertiary Institutions such as:
The South African College of Teacher Education
The University of South Africa
Vista University
Pretoria College of Education (Pretoria Onderwyskollege)
Technikon Northern Gauteng
The Gauteng Department of Nature Conservation
Department of Environmental Affairs and Tourism
City Council of Pretoria
The Pretoria Zoo
National Cultural History Museum
The National Botanical Gardens
Teachers

Objectives of the establishment of the Urban Enviro centre

The immediate and long-term objectives of the project can be outlined in the following aspects and partnerships:

A Establishing an operational *Green House* with the aim to set an example of sustainable living conditions in the inner city, utilizing scarce resources and conserving the city environment.
B. Establishing an Urban enviro centre in partnership with all the role players represented in *Le Fasa La Rena*, with programmes relevant to the targeted audiences and similar outreach programmes, and in a further partnership with other relevant agencies and institutions, including museums and other cultural stakeholders in Museum Park; zoological and botanical gardens; primary and secondary schools; colleges, technikons and universities; CCP: Culture and Recreation with all of its personnel and facilities; public and community forums, clubs, and social groups; environmental groups; other local, regional, provincial and national governmental agencies; and international NGOs and governmental agencies.
C. Establishing an environmental communication and awareness strategy, utilising the resources and expertise of the relevant stakeholders in the GPMA as outlined above.
D. Facilitating and focussing existing environmental efforts in the inner city of Pretoria and maximising the impact of such efforts without duplication.

E. Promoting the Inner City of Pretoria to residents and visitors as an environmentally enlightened city.

These objectives have been negotiated with various role players in Pretoria.

The Social, economic, and/or environmental objectives of the project

It needs to be mentioned that many environmental education centres exist in South Africa, but none of these focus on the urban environment The Centre focus on the urban environment.

Background to the establishment of an Urban enviro centre

Geographical background

The Urban enviro centre is located on the grounds of African Window Museum.. This is one of the components of the National Cultural History Museum which is a stakeholder in Museum Park and situated, in the renovated "Mint Manager's Residence" located on the southwest corner of Bosman and Visagie streets (See map 1). The centre will be implemented for the children and adults, including street children, homeless people and residents of informal settlements as well as high rise flats in the Pretoria Central Business District (CBD). At the same time, the Centre is centrally located near the main train station and drop-off points of bus and taxi routes in the CBD so that residents of suburbs such as Soshanguve and Acacia in the North; Atteridgeville, Laudium, Lotus Gardens and Pretoria West in the West; Mamelodi, Eersterust and Pretoria East in the East; and informal settlements of the Midrand and Centurion in the South, can access the facility easily and cheaply without supplemental means of transport.

Socio-economic background

CBD and city as whole: The Central Business District and the city of Pretoria is still largely divided by racial and economic boundaries. In the eastern and southeastern suburbs, the standard of living is generally very high, and although the resulting consumerism puts unduly high pressure on the environment, there is not a lack of amenities and concurrent knowledge of environmental concern. There is less of a littering problem but more of a consumerism and management problem, because the people create more waste. In the CBD and poorer neighbourhoods, consumerism is lower and waste less severe, but overall concern and appreciation for the total environment is lower as well.

Informal settlements and homeless: Informal settlements and homeless people increase daily in the Greater Pretoria Metropolitan Area (GPMA). These issues must be solved in their own right. But they cause increased strain on the environment in the GPMA. Many people lack basic life skills, daily survival strategies as well as environmental appreciation. As numbers increase, there is a concurrent lack of potable water, sanitary services and electricity. Transport is also non-existing or expensive. Unemployment and crime rates are high.

Suburbs and surrounding communities: Normal municipal services are inadequate in the sprawling suburban communities, with the result that the impact on the

environment is high relative to the population density. Dumping is unregulated, land use is uncontrolled, and environmental appreciation varies from low to moderately high, depending on the area and its development.

3.1.3 Educational background

Large differences still exist in educational standards and opportunities. Many schools, especially private ones, in Pretoria have historically high standards and excellent facilities. Schools in the surrounding suburbs and townships have poorer facilities with a lower standard of teaching. In these areas, classrooms are also often overcrowded and often teachers are inadequately trained. Often discipline is lacking, unstable situations are common, and resources for teaching are low if they exist at all. Farm schools exist in the more rural areas and are managed by the farmers themselves. The facilities of such schools depend on the farmers; some are very good, while others are substandard.

3.1.4 Environmental background

Within central Pretoria and certain of the surrounding suburban communities, the pressure on resources is very high, due in large part to the population density and land use, such as the heavy and light industrial usage of the land. Factories cause water and air pollution. Industries often abuse the natural resources for immediate economic gain. Generally people living or working in such areas do not have a holistic view of the environment and so are unaware that the quality of the environment directly affects their quality of life.

Children who grow up in a city and its immediate suburbs usually do not appreciate that the environment also effects their quality of life. There is a critical need for them to be brought in closer contact with the total environment, but opportunities to do so usually do not exist, as most such children grow up in poor families where such opportunities receive low priority. Furthermore children are not encouraged to conserve and utilise their environment wisely since adults in most communities are largely unaware of the environmental problems themselves. This lack of awareness even exists in wealthier communities with a high standard of living.

3.1.5 Historical background

Existing Movements and Other Concerned Agencies: Numerous agencies and grassroots environmental movements exist in the GPMA, all of whom can become partners in the Urban Enviro centre. Many of these movements and agencies already recognise the need for a holistic approach to urban environmental education and management based on their mission and goals as well as their achievements to date.

There are multiple opportunities for partnerships among the historically active and interested group of environmentally inclined agencies and movements in Pretoria. In addition, numerous other national, provincial, local, and international agencies and parastatals exist, all of whom might become partners in the Centre.

3.4 Facilities provided and actions of the Urban enviro centre

Promoting urban environmental communication and the development of an awareness framework strategy.
Establishing an information and resource centre, promoting communication and interaction between various players in the environmental field by:

- providing pamphlets, environmental resource publications and stickers
- distributing publicity materials and other ad hoc publications and materials to the general public;
- regularly updating an environmental website and providing links to other relevant ones; and
- providing popular newsletters and articles for interested public sector outlets, including the formal electronic and printed media.

An Education Centre serving as resource centre with hands-on environmental educational facilities and holistic programmes focussing on urban environmental issues. The main focus will be on urban environmental issues, such as pollution, waste management, water and sanitation.

- Serving as a practical training facility for students of all tertiary institutions in relevant fields.
- Providing research opportunities for post graduate and other students at tertiary institutions.
- To serve as venue for and development of meetings, workshops, film festivals and symposia on urban environmental issues.

3.5 Actions already taken

A. Funding has been negotiated with the Pretoria Inner City Partnership (PICP) for the renovation of the building in question, the development of basic structures and programmes and the salary of a manager for the Centre. It is intended to include the project on the annual budget of the Inner City Partnership, thus ensuring the sustainability of the project.

B A managing body for the project has been established. This body include 5 members representing role players such as *Le Fase la Rena,* the tertiary sector , the Education Department, Department of Environmental Affairs and Tourism, Museum Park and Business. Two additional role players will be co-opted. The operational actions will be conducted by **project teams such as: Sustainable Living; Programmes; Building and Renovation, and Marketing and Development. The expertise and involvement of individuals from the community regarding the respective project themes will be optimized.**

4 BENEFITS TO ROLE PLAYERS

The following individuals, organisations, bodies and associations may benefit from the project:

A Park partners and other cultural and heritage institutions of Pretoria, the region and nation. Museums will benefit from more visitors, greater utilization of their environmental education programmes and the utilization of their displays. This will provide extra income too.

B Local, metropolitan, provincial and national spheres of government. The city as a whole will be marketed, but its inhabitants will also be informed about ways to assist the city in waste disposal, etc. The city can be marketed to a great extent through this unique establishment.
C. Businesses and industries with a stake in environmental issues and strategies. These institutions can contribute to their social responsibility in a local and direct way an develop the capacity for envirnmental mangement.
D. Tertiary institutions through the involvement of their students. Students can be involved in projects and practical hands-on experiences and research dissertations.

BROAD TIME SCHEDULE

January 1999

Final negotiations with the Museum Park Board and Pretoria Inner City Partnership.

February - May 1999

Negotiation of tenders for building renovation and changing the building in question to a sustainable dwelling
Alterations to building and changing the building to a sustainable dwelling
Development of first pilot programmes through various role players
May - appointment of manager and educational officer
Meetings with role players
Setting up website and commencing with data base
Design of interior decorations and structures

June 1999

Marketing

July - November 1999

Piloting of various programmes as indicated.
Operalisation of equipment.

6 SOME PRACTICAL EXAMPLES OF ENVISAGED PROGRAMMES

As indicated above, a large cadre of resources, especially individuals with their knowledge of and passion for the topic, published materials, audiovisual aides, et cetera, exist in the region to develop a strategy and a centre. Forums of interested community members and staff from relevant agencies and institutions will be assembled to formulate a communication and awareness strategy. At the same time, the same forces will be marshalled to develop an Urban enviro centre with relevant environmental messages for inner city residents as well as those of the GPMA. Examples of such projects are provided.

6.1 EASY Project

The EASY Project or Environmental Awards System is a programme of numerous incremental environmental projects for schools. The project is been co-ordinated at the centre. Each small project covers some aspect of environmental education and the school gets credits for each project completed. After gaining a certain number of credits, awards are presented to the school. Initially this project was developed by "Keep Pietermaritzburg Clean", but has been extensively revised and made more environmentally relevant by members of Le *Fase La Rena* and various other institutions. This project is at the moment been piloted in ten school in the Pretoria Metropolitan Area.

6.2. Life Skills Projects

The following projects will be started:

1). Multi-cultural nutrition and food gardening project utilizing traditional means of supplying proper nutrition and growing foods for home consumption. This will be a partnership project with the Kalafong Hospital Project. Skills will be illustrated at the centre.

6.3 School Partnership Projects

Many schools in the GPMA have insufficient resources to adequately teach environmental education. Some schools have started projects at a local level. Many schools are seeking partnerships, project ideas, and resource materials. A number of projects already listed elsewhere will be used as school projects. These include the EASY Project, The Enviro Drama Project, and Art from Recycled Materials Project. The Youth and Culture coordinators of the four school districts will become partners and be able to assist in implementation of school projects. Art from Recycled Materials in partnership with Marinda Botha.'s Community trust. This project will teach young people hands-on activities that are environmentally friendly because they reuse materials.

6.4 Youth Club Projects

Various groups in the GPMA, including churches and charity organizations, sponsor youth clubs. These clubs are looking for programmes, including some with environmental education as theme. The Centre can supply such programmes, especially to groups of inner city youth who might then become associated into clubs as the situation warrants. The EASY project listed above is a natural project that can be adapted and implemented immediately for youth clubs as well as in schools.

6.5 Street Children Projects

Institutions caring for street children in the CBD is already partners of the Centre and has shown that this is a safe, ascetic, and enjoyable place to spend spare time. Projects that lend themselves to this effort are the EASY Project, Enviro Drama Project, Art from Recycled Materials Project, and some of the Resident Centre projects such as the classes for children, the enviro video centre and lectures for children.

6.6 Resident Centre Projects

The centre's manager have developed projects and programmes on urban environmental issues in conjunction with specialists, education officers of Museum Park and members of Le Fase Le Rena.

6.7 Resource Centre Project

The Centre is housing a resource centre for environmental materials, an environmental data base, education materials and a library of resource materials such as regulations from various governmental agencies. The Resource Room have been developed with corporate sponsorship and contributions from various partners such as the national water conservation campaign and Mondi recyceling, including other Enviro Centres in the region, Delta Environmental Education Centre in Johannesburg and elsewhere. This Resource Room will serve the public, students, educators, land developers, architects, city planners, and similar individuals. The Centre will operate in co-ordination with other institutions and resources will not be duplicated.

6.8 Curriculum linked programmes

The new outcomes based education system makes the contribution of various role players to education possible. Institutions, such as the museums, business and industry can therefore link to formal education.

7 DEVELOPMENT AND MARKETING PROJECTS

After establishing the Marketing and Development Committee and appointing the centre's manager, development and marketing activities should be given primary attention.
A long-term business plan needs to be written so that corporate and other sponsors can be found. To assist in finding sponsors, a suitable brochure will be developed.
A newsletter will also be started. Publicity activities and media contacts must be established. The future continuity of this Centre depends on these activities.
The centre's manager and educational officer must be assisted by experienced individuals coming from the environmental education and management community or elsewhere. Partnerships with companies and others must be established to offset costs and lend expertise to these efforts.
It has also been stated that the Pretoria City Council (PCC) may annually contribute to the running of the centre, as well as to marketing costs.

Appendix 2 - Interview framework 2001 text size and layout

Interview questions

1. Were you involved in the establishment of the Centre?
2. Why was the ICEC established?
3. How long did the process take?
4. There were a few arms that needed twisting along the way...were you involved in convincing them?
   In retrospect do you think that their reservations were justified?
5. What role did you feel the ICEC would play in Tshwane?
6. What do you understand by sustainable development?
7. How did you envision the ICEC implementing sustainable development?
8. Do you think was realistic?
9. Do you feel that the ICEC has met its objectives? (1 = yes and 5 = definitely not)

Objective A	
Objective B	
Objective C	
Objective D	
Objective E	

10. Are you involved with projects at the ICEC, if so name them, if not why?
11. How do feel the ICEC has benefited their target market?
12. Do you think the Centre is: 1 = under-utilized and 5 = well-utilised by its intended partners?

Museums	
Residents	
Local government	
Schools	
Businesses and industry	

13. Environment is made up of many components. Place the following words in the order you feel best describes it, most important being one and least five.

Social	
Political	
Natural	
Cultural	
Financial	

14. The ICEC has broadened its scope to include not only environmental education, are tourism and sustainable development related in your eyes?

15. What was the role of the management committee and particularly your role?

16. Other Comments

Appendix 3 - Interview framework 2004

Follow-up interview questions

Title: The provision of EE towards sustainability with reference to the ICEC in Tshwane.

1. Define environmental education:
2. Define sustainability:
3. What role did you feel the ICEC would play in Tshwane?
4. How did you envisage the ICEC being an environmental education and sustainability information provider?
5. Do you think this was realistic?
6. Do you feel that the ICEC has met its objectives? (1 = yes and 5 = definitely not)

Objective A	
Objective B	
Objective C	
Objective D	
Objective E	

7. Are still you involved with projects at the ICEC? If so, name them:

Year: Project: Topic: Capacity: Duration:

If not, why not?

8. In the interim have you been involved in other EE or sustainability projects that did not involve the ICEC?

Year: Project: Topic: Capacity: Duration:

9. Have you worked on other projects?

Year: Project: Topic: Capacity: Duration:

10. The ICEC has broadened its scope to include not only environmental education and sustainable development but also tourism. Are these three concepts related in your eyes?
11. Were tourism, EE and sustainability with regards to the ICEC possible? Please explain.
12. How do feel the ICEC has benefited its target market?

Do you think the Centre is: 1 = under-utilized and 5 = well-utilised

Museums	
Residents	
Local government	
Schools	
Businesses and industry	

13. The environment is made up of many components. Place the following words in the order you feel best describes it, most important having a value of 1 and least having a value of 5.

Social	
Political	
Natural	
Cultural	
Financial	

14. Many environmental centres existed before the ICEC and others were developed afterwards. Can you compare these centres to the ICEC?

Centres	Heard of and comments	Never heard of or visited
Veld schools – Glenburn /Glenmore? in Natal which is still funded by GDE. Which one?		
Suikerbosrand		
Delta Environmental Centre		
The GreenHouse (Joubert Park)		
The Conservation Centre in Cape Town		
Transvaal Museum's Discovery Centre		
Eco-schools (the concept) – thus is it necessary to have educational centres?		

15. What sort of market research was done to determine the needs of the educators, learners and community before the ICEC was established?

16. Of the research done during this study, in terms of the educators, the topics that they wanted information on, are included in order of need:

Water – top priority
Natural environment
Plants
Permaculture
Soil
Animals
Disease
Crime
Energy conservation
Social environment
Biodiversity
Sustainable development
Economic environment
Insects
Population dynamics

17. Do these results change your expectations of the ICEC and its development and location, in being a suitable EE provider?

18. When asking the educators where they had been and where they would like to go, they rated the following places, please do the same and rate them from 1-20.

Place of Interest	Positive aspect in your eyes	Possibility for ICEC to learn from it / link in with it or enhance it?
African Window		
Animal Farm	E.g. see and touch farm animals	
Botantical Gardens		
Foundation for Education of Science and Technology		
Gold Reef City		
Hammanskraal Industries		
Happy Acres		
Melrose House		
Miltary Base		
Monte Casino Bird Park		
Pilanesberg		
Pioneer House		
Rietvlei Nature Reserve		
Roodeplaat		
Thabela-Thaberg		
Transvaal Museum		
Waterval Boven		
Willem Prinsloo		
Wonder Caves		
Zoo		

How do you feel the ICEC compared with those mentioned below?

19. Below is how the educators decided where to go on visits. Does this change how you would have marketed the centre and do you agree with what they rated as most important? Please give your own opinion (1- most important and 5- least important)

Educators opinion **Your own opinion**

Good education programmes – most important
Connection with curriculum
A previous visit
Recommendation
A brochure
Locality

Thank you for your time and input!

Appendix 4 - Questionnaire

Inner City Environmental Centre Questionnaire

1. Name:
2. School:
3. Date:

Excursions

4. Have you ever taken your class on an outing / excursion?
5. If yes, where have you been?
6. If no, what have been your constraints?
7. If these constraints were overcome where would you wish to take your class?

8. What makes you decide to visit a particular place: a previous visit, brochure, a recommendation from another teacher or trusted source, good education programmes, cost, locality.

9. If you could choose the ideal day outing for your class (fully paid for) where would you go?

10. Do you feel that guest speakers or shows at the school have the same effect/ influence as an outing?

11. Do the parents of the class get information about each visit or only an indemnity to sign?

12. Where have you been and where they would like to go. Rate the following places from 1 – 20 (1 being favourite place to visit and 20 being least likely to visit)

Place of Interest	Positive aspect in your eyes	Possibility for ICEC to learn from it / link in with it or enhance it?
African Window		
Animal Farm	E.g. see and touch farm animals	
Botantical Gardens		
Foundation for Education of Science and Technology		
Gold Reef City		
Hammanskraal Industries		
Happy Acres		
Melrose House		
Miltary Base		
Monte Casino Bird Park		
Pilanesberg		
Pioneer House		
Rietvlei Nature Reserve		
Roodeplaat		
Thabela-Thaberg		
Transvaal Museum		
Waterval Boven		
Willem Prinsloo		
Wonder Caves		
Zoo		

How do you feel the ICEC compared with those mentioned below?

13. Below is a few factors that might influence your decision on where to go. Please rate them in order of importance (1- most important and 5- least important). If there are other factors not mentioned please include them.

Educators opinion **Your own opinion**

Good education programmes – most important
Connection with curriculum
A previous visit
Recommendation
A brochure
Locality

Enviro Centre

14. Have you heard of the Inner City Enviro Centre?
If yes, how did you hear about it?
15. Do you know that they run environmental education programmes?

16. If you could develop or have someone develop three environmental programmes / lessons for your class, which aspect of the environment would you like to be include (rate in order of need or importance):

Water – top priority
Natural environment
Plants

Permaculture
Soil
Animals
Disease
Crime
Energy conservation
Social environment
Biodiversity
Sustainable development
Economic environment
Insects
Population dynamics

17. If you had to teach the following topics, which of the teaching methods mentioned below would you use (you can use one more the once and if you have a method not mentioned below please state it).

Theme	**Teaching method/s number**
The water cycle	
Fractions	
Production of electricity	
Colours (Primary and secondary)	
Nelson Mandela – the man behind the rainbow nation.	
Health – Winter is here, are you ready?	
Life cycle of a vegetable	

1. Chalk and talk
2. Self discovery
3. Past experiences
4. Hands on learning
5. Outdoor education
6. Theoretical examples
7. Practical examples
8. Storytelling
9. Videos
10. Excursions
11. Drama
12. Other

Thank you for your time!