

**DETERMINING THE EFFECTIVENESS OF ENVIRONMENTAL EDUCATION  
INITIATIVES OF SELECTED GOVERNMENT DEPARTMENTS IN SOUTH  
AFRICA**

by

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THESIS

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## DECLARATION

Student number: 07280033

I declare that “*Determining the effectiveness of environmental education initiatives of selected government departments in South Africa*” is my own work and that all the sources i have used and or quoted have been acknowledged by means of complete references.

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Matlala Violet Makokotlela

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Date

## **DEDICATION**

I dedicate this study to:

- The Almighty God for the wisdom, strength and encouragement He gave me.
- My departed parents Makhoshi and Mmankwana Makokotlela.
- All my family members for the support and encouragement towards the completion of this study.

## **ABSTRACT**

This study investigated the effectiveness of environmental education (EE) initiatives of selected government departments in South Africa, namely the Department of Basic Education, the Department of Water Affairs, the Department of Environmental Affairs and the City of Tshwane municipality. The literature review formed the framework within which the qualitative study was conducted. Considerable research emphasises that teachers are implementers of EE initiatives. However, these implementers are not trained in EE and on how to infuse environmental content in teaching and learning. In addition, the study investigated the factors that lead to partial or total failure of EE initiatives by the selected government departments and the City of Tshwane municipality.

Fundamentally, EE initiatives are not effective and/or sustainable due to the lack of effective training of implementers, particularly teachers and subject advisors. The lack of relevant resources, coordination, and monitoring and support contributes greatly to ineffectiveness and the lack of sustainability of the initiatives. The lack of monitoring and support results in unsustainable initiatives because the teachers lose courage. The research findings revealed that the approach of having one champion in schools during the implementation of EE initiatives by partners poses some challenges, especially after the partners had left. The champion might be promoted to another school or may even be promoted in the same school. Once the champion is promoted, the responsibilities increases and the teacher then stop championing the EE programme or project. The factors mentioned above are aggravated by the lack of knowledge and skills to infuse EE initiatives because teachers regard EE initiatives as an add-on. In addition, schools lack finances to sustain EE activities and these results in schools not continuing with these activities.

This study advocates that teachers and subject advisors should be effectively trained in EE to enable them to effectively infuse environmental concepts and topics in teaching and learning and make it more practical rather than theoretical. Relevant resources should be made available to teachers and monitoring and support should be considered. Effective coordination and collaboration should be taken into account to ensure sustainability of the EE initiatives.

In addition, the study provides guidelines that would improve the effective implementation of EE initiatives by both implementers and partners.

**Key concepts:** constructivism, collaboration, networking, partnerships, local government level.

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## ACRONYMS

2020 VFWSEP	Vision for Water and Sanitation Education Programme
AMLD	Associação Mico Leão Dourado
BETD	Basic Education Teachers Diploma
BKB	Bontle ke Botho
C2005	Curriculum 2005
CAPS	Curriculum and Assessment Policy Statement
GDARD	Gauteng Department of Agriculture and Rural Development
DEA	Department of Environmental Affairs
DoBE	Department of Basic Education
DoE	Department of Education
DRFN	Desert Research Foundation of Namibia
DWA	Department of Water Affairs
EE	Environmental Education
EEASA	Environmental Education Association of Southern Africa
EEPI	Environmental Education Policy Initiative
ESSP	Environmental Sector Skills Plan
FET	Further Education and Training
GDoE	Gauteng Department of Education
GEEF	Gauteng Environmental Education Forum
GET	General Education and Training
HCDS	Human Capital Development Strategy
HET	Higher Education and Training

ICT	Information and communication technology
LTSM	Learner teacher support material
MBEC	Ministry of Basic Education and Culture
MMAEP	Midlands Meander Association Education Project
NCS	National Curriculum Statement
NEEN	Namibian Environmental Education Network
NESDPF	National Environmental Skills Development Planning Forum
NGO	Non-governmental organisation
NIED	National Institute for Educational Development
RSA	Republic of South Africa
SANBI	South African National Biodiversity Institute
TVET	Technical Vocational Education and Training
UN	United Nations
UNEP	United Nations Environment Programme
WESSA	Wildlife and Environmental Society of South Africa
WWF-SA	World Wild Fund of South Africa

## **CHAPTER 1**

### **ORIENTATION**

#### **1.1 Introduction**

Environmental problems pose a problem worldwide. Venter and Loubser (2008:22) state that the state of the environment has become one of the major issues of our time. Governments should take actions in response to these environmental problems (Sitarz, 1994:93). World summits and conferences have been held by various countries in an attempt to address the same problems. Hens and Nath (2005:2) state that a pioneering conference of the United Nations (UN) was held in Stockholm in 1972. This was followed by some other important conferences such as Tbilisi (UNESCO-UNEP, 1977). More recently, the Earth Summit Strategy to Save Our Planet (Agenda 21) was held in Rio de Janeiro in 1992, followed by the World Summit on Sustainable Development that took place in 2002 in Johannesburg 10 years after Agenda 21 (Masondo, 2002:5). He further indicates that in Rio, Agenda 21 was developed and agreed upon by representatives of countries who attended the conference. Moosa (2002:3) has this to say about Agenda 21: “The Agenda 21 Framework laid the basis for sustainable development; it did not provide the consensus and commitment needed to implement sustainable development”.

The UN Conference on the Human Environment organised in Stockholm in 1972, and the Tbilisi conference held in 1977 (Palmer & Neal, 1994) focused on environmental issues. Environmental education (EE) was considered as a fundamental tool to ensure the quality and sustainability of the environment. The World Summit on Sustainable Development focused on the implementation of strategies set to address environmental problems, in contrast with Agenda 21, which contains agreements to address environmental problems. Both the agreements and set strategies were decided on at international level, meaning that all governments should act and implement them worldwide.

Some of the Agenda 21 agreements to be implemented at all levels of society include the following (Sitarz, 1994:93):

- EE is crucial to promote sustainable development and improve the capacity of people to address environmental and developmental issues. EE is regarded as a critical strategy to raise public awareness and training linked to all areas. This includes both formal and non-formal education, which is regarded as indispensable to changing people's attitudes towards the environment.
- Governments should strive to prepare strategies aimed at integrating the environmental and developmental issues into education at all levels in cooperation with all segments of society. It therefore implies that all governments should be engaged in environmental actions to address environmental problems.
- The UN, with the assistance of governments and private organisations, should establish a programme to integrate Agenda 21 into all existing UN educational materials.
- Countries should strengthen the national centres of excellence in education in environmental and developmental science and law and the management of specific environmental problems.
- Public and scholastic forums should discuss environmental and developmental issues and suggest sustainable alternatives to policy makers.
- Countries should cooperate with one another to prepare educational tools that include regional environmental and developmental issues and initiatives.

The importance of government action is emphasised by Bateman (2002:1) as follows: "The mission of the publication of the World Summit on Sustainable Development was to establish and highlight case studies in sustainable development across all sectors of business and government as spelled out in section 2 of the Long Walk to Sustainability". According to Masondo (2002:5), "[t]he summit will provide both the inspiration and the necessary momentum to intensify our own Local Government programmes well beyond the summit".

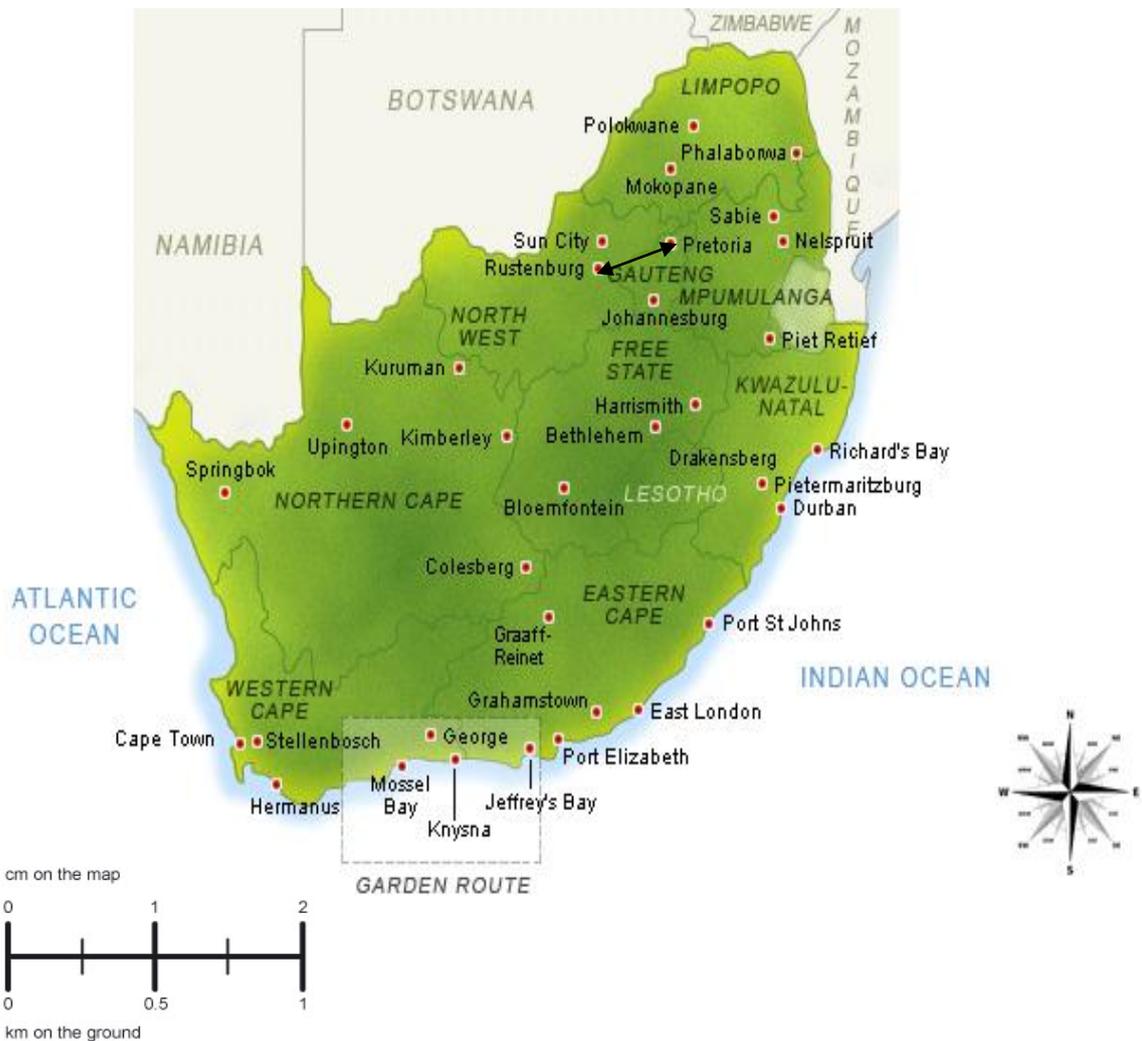
It is clear that Agenda 21 focused on setting out strategies that were agreed upon by the countries that attended the summit. These strategies consider EE as the vehicle to ensure development that is sustainable. Popov, Kungolos, Brebbia & Itosh (2006:78) are in agreement with Agenda 21 that education is key to address waste in New Zealand since

waste minimisation was slow. Agenda 21 emphasises that all people should be educated about the environment to enable them to address environmental and developmental issues. Masondo (2002:4) mentions that achievement of targets set during the summit must be achieved by, among others, the various governments. It is the governments' responsibility to ensure that the development advocated by Agenda 21 is sustainable. The delineation and limitations of the study are discussed below.

## **1.2 Delineation and limitations**

The study included three sampled government departments, namely the Department of Basic Education (DBoE), the national Department of Water Affairs (DWA) and the national Department of Environmental Affairs (DEA), as well as one municipality to represent the local governments, namely the City of Tshwane municipality. This study deems it necessary to indicate that this study focused at the Gauteng Department of Education (GDoE). The sampled schools and Tshwane South district covered by this study are from Gauteng Department of Education. These Departments were sampled for practical reasons, as it would be difficult to include all the government departments and municipalities in South Africa. Samples were selected based on their involvement in EE actions and are therefore regarded as key informants of this study. The research approach, which was qualitative, had some weaknesses, which will be outlined in table 1.1 later in this study.

This study focused on the selected government departments of the Republic of South Africa (RSA). Figure 1.1 below presents the map of South Africa that was covered by this study.



**Figure 1.1: The map of South Africa Source: googlemap**

The RSA consists of nine provinces, namely Limpopo, North West, Northern Cape, Eastern Cape, Western Cape, KwaZulu-Natal, Free State, Mpumalanga and Gauteng. Three government departments of South Africa were selected for the study, namely the DWA, Gauteng DoE and DEA, as well as the City of Tshwane municipality. All the selected government departments and the City of Tshwane municipality are situated in the Gauteng province, specifically in the city of Pretoria, which is clearly indicated by the arrow in the map.

Pretoria is the capital city of South Africa. Two of the selected government departments, namely the DWA and DEA, are at national level, while the study also focused on the

district level with regard to the Gauteng DoE. The selected district in which the study was conducted is also in Pretoria, namely the Tshwane South district. All the primary and secondary schools sampled for this study are situated in the mentioned district. The district had 156 primary and 98 secondary schools at the time of the study.

The reason for selecting these variables is because these institutions have high knowledge regarding the implementation of EE initiatives and they represent a single case study for this research from which context-bound generalisations will be made. The City of Tshwane municipality also participates in the implementation of EE initiatives. A joint implementation of EE initiatives exists among the government departments and between the government departments and the City of Tshwane municipality. The discussion of departments involved in this study follows in Section 1.3.

### **1.3 Departments involved in environmental education initiatives**

As stated above, this study included three government departments, namely the Gauteng DoE, DWA and DEA and one municipality, the City of Tshwane municipality, which were sampled purposively. The samples were chosen because of their high participation and knowledge about the phenomenon in question. Furthermore, they are engaged in either environmental projects and/or programmes, which were essential for this study. The aim was to determine the effectiveness of the environmental actions implemented by government.

### **1.4 Partnerships**

A partnership is an arrangement where parties agree to cooperate to advance their mutual interests (Partnership, n.d). Furthermore, they exist within and across sectors and are common between individuals, businesses, interest-based organisations, schools and governments. Partnerships can take place at both international and national levels. For example, governments have partnerships at the international level through projects. The Gauteng DoE in South Africa is involved in a partnership at international level to address the issue pertaining to energy efficiency. This is done through a project that deals with

energy. A good example is that of learners from Pace College in South Africa who use Skype to communicate with learners from the Uhlandeschule in Germany to compare how much electricity their schools use (Foss, 2011:17).

At national level, partnerships include those between EE centres such as the Delta Environmental Centre in Johannesburg, the Walter Sisulu Environmental Centre in Mamelodi, Mogale's Gate Environmental Education Centre in Hekpoort and the Gauteng DoE. Teachers and learners are taught about the issues pertaining to the environment such as waste management, recycling, climate change and global warming.

This is an indication that government departments are engaged in actions that address environmental issues. As was indicated earlier, the Johannesburg summit focused on the implementation of strategies set to address environmental problems. Mention was made that people believed that the summit would develop tangible action-oriented programmes with clear timeframes and resource commitment needs, which include among others water and sanitation, agriculture and the protection of natural resources (Masondo, 2002:5). He further indicates that the summit will provide both the inspiration and the necessary momentum to intensify our own local government programmes well beyond the summit.

### **1.5 Problem description**

According to Dalal-Clayton, Swiderska & Bass (2002:12), both developing and developed countries are faced with problems of preparing strategies for sustainable development. According to Poole (2006:1) developing countries are faced with a great task of providing people with clean water, sanitation, housing, and health care as well as meeting the challenges of sustainable development. It is further indicated that governments urgently need to address several key uncertainties if they are truly serious about meeting international targets for sustainable development strategies. Furthermore, governments developed plans and policies to address environmental problems; however, there is a gap between theory and practice (Azeiteiro, Pereira, Morgado, Filho & Ves, 2004:17). These authors contend that:

Although environmental education plans and policies have been developed and implemented in many countries with positive evolution in many fields of most countries, many expectations and priorities set before are still to be fulfilled at both international and national level, for example Belgrade, Tbilisi and Agenda 21.

The viewpoint is held by the Department of Environmental Affairs and Tourism (DEAT) (2007:82) currently known as the Department of Environmental Affairs that while policy and legislation are, broadly speaking, in place, implementation and enforcement have been inadequate, particularly at provincial and local government levels, where a suite of constraints hinders progress toward sustainable development. Furthermore, according to Azeiteiro *et al.* (2004:17):

The gap between theory and practice enhances the need to better understand the underlying reasons, to learn from past experiences and improve environmental education in the future, in this way opening paths for further research, further evaluation and further debate in the field.

In addition, Dala-Clayton *et al.* (2002:7) assert:

Since the Rio Earth Summit in 1992, the international community, national and local governments, private sector organisations, NGOs, and others have struggled to find ways to operationalise sustainable development. Achieving this has remained elusive.

Reddy (2011:10) indicates that the importance of including EE in formal curricula is indispensable, but its implementation has often been described as less than ideal and below potential.

The above citations make it clear that governments are facing certain challenges where the implementation of EE initiatives is concerned. Indication has been made earlier that environmental problems pose a problem worldwide and that the state of the environment has become one of the major issues of our time (Venter & Loubser, 2008:22). Environmental problems have reached unprecedented levels to the extent that few would

disagree that our planet is on the brink of ecological disaster (Reddy, 2011:11). The DEAT (2007:xv) asserts: “The ability of the earth to sustain us is therefore diminished by, for example, accelerated rates of deforestation, soil erosion, desertification, and increasing levels of air and water pollution”.

Climate change is in some cases the result of the negative consequences of most human–environment relationships. Edwards (2011:1) maintains that the current state of affairs on the earth is an environmental crisis of global proportions that is threatening the existence of humanity. It is imperative for humankind to live in a sustainable way in order to preserve the environment for future generations. Masondo (2002:5) points out that we have borrowed this world from our children and therefore we should preserve it for future generations. In other words, the increasing pace of human-induced environmental change is altering the ability of the environment to provide essential goods and services, which in turn impedes progress towards sustainable development. Environmental problems caused by negative human activities create problems often accompanied by risks that disturb the harmonious existence of humans, especially the most vulnerable with limited access to adequate material resources, while the negative human activities also interfere with the proper functioning of natural ecosystems (Wanyama, 2009:25). He further mentions that consequently the regenerative rates of these systems are reduced, lowering their capacity to supply natural materials upon which humans depend, which include air, trees, soil, water, forests and animals, and that there is an apparent increase in environmental problems generated by most human activities.

According to Sitarz (1994:93) it has been generally agreed that governments should take action in response to environmental problems. The DEAT (2007:319) shares the same view when saying government at all levels plays a central role in devising and implementing actions affecting the environment. Governments should be involved because they control domestic laws, regulations and policy decisions and the implementation of related actions. The DEA (2009:2) contends that the state of the environment is declining or deteriorating in South Africa. It is of paramount importance to investigate governments’ EE initiatives and their effectiveness, both in other countries and in South Africa, because the ineffective implementation of EE means that no significant actions are taken to address the socio-economic, biophysical and cultural problems.

## **1.6. Towards effective environmental education in selected international countries**

### **1.6.1 Mexico**

#### **i. Government: Department of Education**

A study conducted by Souz  (2011:11) in San Juan Nuevo (a small settlement in the central highlands of Mexico in the state of Michoac n) shows that the Mexican government took the initiative to integrate EE into the curriculum in Mexico. Student field trips are available as extracurricular activities to view operations and forest lands on a voluntary basis. Further indications are that excursions are offered outside regular school hours administered by local teachers along with representatives from La Comunidad Indigena (Communal Forest Enterprise). However, the author indicates that EE was at an early development and there was a need and desire for more EE and training in San Juan Nuevo (Souz , 2011:95).

Barraza and Cuar n (2004:18-20) conducted a study from sampled environmental schools focusing on children who have three years of primary education (aged 7 to 9) that were actively involved in local, national and international environmental projects, using 10 environmental concepts. The authors investigated how values in education affect children's environmental knowledge (considering the impact of the educational system and the school ethos on the formation of environmental concepts). To promote EE in this area, a theoretical and practical teacher training course was designed for primary school teachers (Monroe, 1999:74).

#### **ii. Non-governmental organisations**

Pronatura Sonora is an environmental non-governmental organisation (NGO) in the state of Sonora in Mexico (Lazcano-Ferrat, 1999, cited in Monroe, 1999:66). It designed a public involvement programme for the long-term management of coastal wetlands in which public involvement and the education programme led to a series of successful teacher-led projects in rural areas, covering 11 wetland systems in a coastal area of

540 000 hectares. According to Souza (2011:2), some EE programmes for both students and residents are carried out through the Communal Forest Enterprise. Non-formal EE activities throughout Mexico tend to be fragmented, as NGOs serve their local areas with little strategic planning or coordination with other state or national efforts (Monroe, 1999:75).

## **1.6.2 Namibia**

### **i. Government: Department of Education**

Effort has been made by the DoE of Namibia to integrate EE into the curriculum. This is evident because Simalumba (2011:2) mentions that Namibia has a draft EE policy document that will govern the envisaged nature of EE. According to Simalumba (2011:24), in order to ensure the success of EE initiatives, the Namibian government should develop an enabling environmental policy framework within which both regional and local activities can flourish. Further mention is made of the fact that the lack of learner teacher support material (LTSM) hindered the implementation of environmental learning in Geography severely.

## **1.6.3 Brazil**

### **i. Government**

Morimoto (2012a) stresses that there is a challenge for EE particularly in terms of preparing people for participation in decision making. The author indicates that the social, environmental and economic problems that we face today present new challenges to EE. Further indications are that social problems such as poverty can cause EE challenges in places that are poverty-stricken, which may include land pollution and deforestation. According to Morimoto (2012b & c), EE is not effective because environmental laws are not accessed by the public and the public is not involved in environmental decisions. This creates a gap between policy and implementation (Morimoto, 2012d).

## **ii. Non-governmental organisations**

Engels and Jacobson (2007:3) evaluated an EE programme of the Golden Lion Tamarin Association in Brazil. Engels coordinates the planning and implementation of evaluation and develops outreach components for projects at the centre for Biodiversity and Conservation of the American Museum of Natural History in New York City, while Jacobson is a professor in the Department of Wildlife Ecology and Conservation at the University of Florida Gainesville. In addition, Jacobson's research concerns the human dimensions of wildlife conservation with a focus on EE. The intention was to evaluate the EE programme of the Golden Lion Tamarin Association by comparing the results of a 2001 survey with baseline data from 1986. It involved 666 residents of Brazil.

## **iii. Local initiatives**

According to Iared and De Oliveira (2012:129) the São Carlos Ecological Pole units (São Carlos, São Paulo) were investigated to determine if the units are educating spaces that could contribute to understanding of the complexity of environmental issues. The investigation was done by interviewing teachers who had accompanied visits to the units; members involved with environmental education in the units and followed guided tours in all units of the ecological pole.

The project was signed into agreement in June 2010 with the main aim to integrate environmentally relevant administrative units in order to jointly conduct an effective and contextualised work of “diffusion” of EE, constituting an ecological corridor between their natural areas and to integrating various existing educational initiatives in order to develop a coordinated environmental education work (Iared & De Oliveira 2012:129). Identified units are situated in urban areas in the city while providing an opportunity for both residents and visitors to connect with the natural environment. These units comprise of the local zoo; municipal botanical gardens, which include a plant nursery and an ecological trail; the municipal organic vegetable garden; the municipal utility of Espreado (water extraction); an experimental farm; and a nature trail inside a public university. The units are run by the municipal and federal government and a municipal utility (Iared & De Oliveira, 2012:129).

#### **1.6.4 Canada**

##### **i. Government: Department of Education**

According to Mayer-Smith, Bartosh and Peterat (2009:120), Bartosh is a research reviewer for the Canadian Council on Learning and her research interest is in EE, in particular EE curriculum and policy development, assessment and ways of integrating EE into school practices. It therefore implies that the Canadian government took an initiative to implement EE by infusing it in the curriculum in which Bartosh researched the feasibility of integrating EE into school practices. Mayer-Smith *et al.* (2009:107) engaged in an urban farm EE project with the purpose of illustrating how eco-philosophies could be translated into educational programmes that foster environmental consciousness and care, and further the critical and systematic examination of EE initiatives. The project involved elementary school children and community elders who worked as partners.

Further indications are that while teachers' philosophies and approaches evolved over the course of the project, some teachers held firmly to the curriculum agendas they believed were supported by the schools where they taught (Meyer-Smith *et al.*, 2009:114). Government has also assisted with the project through funding and in-kind support through the Department of Curriculum Studies and Pedagogy, the Faculty of Education and the Faculty of Land and Food Systems. According to Mayer-Smith *et al.* (2009:118), despite the existence of support for interest in EE, EE will remain marginalised in the existing education system unless schools can blur the disciplinary boundaries created by the existing curricula. The authors further mention that teachers and environmental providers need to work together on a regular basis to create curricula opportunities that build on experiential learning and integrated school experiences.

#### **1.7 Towards effective environmental education in South Africa**

This research explored the effectiveness of EE initiatives of the South African government through selected departments, as mentioned earlier.

## **1.7.1 Government**

### **1.7.1.1 Department of Basic Education**

According to Reddy (2011:10), the importance of including EE in formal curricula is undisputed, but implementation has often been described as less than ideal. The agenda for the formalisation of EE in South Africa has been promoted by the Environmental Education Association of Southern Africa (EEASA). The Environmental Education Policy Initiative (EEPI) emanated from the EEASA membership; the EEPI shifted its emphasis from policies to curricula and was renamed the Environmental Education Curriculum Initiative. EE was first introduced into the South African formal school curriculum in 1997 when Curriculum 2005 (C2005) was instituted (Reddy, 2011:15). This was done through the inclusion of an ‘environment’ phase organiser. The EE content continued to be included in the curriculum, for example the National Curriculum Statement (NCS) is based on social justice, a healthy environment, human rights and the inclusivity principle, which still applies to the current Curriculum and Assessment Policy Statement (CAPS). In Chapter 2 of the Constitution of South Africa, the Bill of Rights reports that everyone has the right to basic education, including adult basic education and further education, which the state must make available and accessible progressively through reasonable measures. South African formal education is categorised into three levels, namely:

- General Education and Training (GET)
- Further Education and Training (FET)
- Higher Education and Training (HET).

Formal education from GET to FET for basic education is implemented through the NCS, which is gradually moving to CAPS. The NCS learning area/subject policy documents integrated environmental issues into the content (DoE, 2002). As stated by the South African Government (2012:n.p.) the aim of the NCS is to develop the full potential of all learners as citizens of a democratic South Africa and it “seeks to create a lifelong learner who is confident and independent; literate, numerate and multi-skilled, and compassionate, with a respect for the environment and the ability to participate in society as a critical and active citizen”.

However, the effective integration of environmental content into teaching and learning poses a challenge due to the lack of resources (Bopape, 2006:102; Frohlich, 2004:88; Maila, 2003:38; Mudzunga, 2006:121). According to Reddy (2011:21), professional developments presented by some formal programmes to teachers were the exact opposite of what is conceptualised as effective for professional development in EE.

### **1.7.1.2 Department of Environmental Affairs**

Although the DEA is to take the lead with regard to the implementation of environmental acts, it also provides EE actions under the Directorate: Sector Education, Training and Development, whereby issues pertaining to biodiversity, recycling and conservation of wetlands are taught to learners in schools. The DEA wrote a booklet with the title “An introduction to careers” to encourage learners to follow environmental careers (DEA, 2009: n.d.). This booklet shows various careers that focus on the environment. This provides evidence that the department agrees with Agenda 21 when it states that education, in particular EE is indispensable to address environmental problems. People can protect the environment only if they are educated about it and know its value. This study aims to explore the effective implementation of these actions because the literature reveals that there is a gap between policy and practice.

### **1.7.1.3 Department of Water Affairs**

According to the DWA, South Africa is a water-scarce country, but most citizens are not aware of the situation (DWA, n.d.(b)). The DWA’s responsibility is to ensure that people have clean water. The DWA in South Africa embarked on a number of programmes to conserve and diversify its water sources, such as desalinating seawater in coastal areas and increasing effluent recycling. Other programmes include the 2020 Vision for Water and Sanitation Education Programme (2020 VFWSEP). The 2020 VFWSEP includes activities such as the *Baswa le Meetse Award*, the *South African Youth Water Prize*, *Aqua Enduro*, *Working for Water*, and curriculum support and intervention (DWA, 2010b). The

*Bawsa le Meetse* competition is a collaborative effort by the Gauteng DoE schools, DWA, Arts and Culture, and the MTN Foundation.

#### **1.7.1.4 City of Tshwane municipality**

Municipalities in South Africa are committed to addressing environmental issues, which commitment followed after the World Summit on Sustainable Development in 2002. The City of Tshwane municipality as part of local government was chosen for this study because of its high level of participation in EE initiatives. The commitment to the implementation of Agenda 21 is addressed through projects or campaigns, among other activities. The city embarked on its *Bontle ke Botho* (BKB) campaign, meaning “being beautiful is being human” (City of Tshwane, 2010:2). The City of Tshwane (2010:1) indicates that participating in the BKB campaign requires the initiation of environmental projects/campaigns that address thematic areas such as sustainable agriculture, water and energy conservation, litter and waste management and greening. The campaign is implemented in schools through competitions. It is important at this stage to evaluate the effective implementation of this campaign. The problem statement of the current study is presented in the section below.

#### **1.8 Problem statement**

Environmental problems pose a problem worldwide, as mentioned earlier. Human activities have a significant impact on the environment at both local and global levels (DEAT, 2007:xva), while Edwards (2011:1) mentions that the current state of affairs on the earth has been presented as an environmental crisis of global proportions that is threatening the existence of humanity. These impacts include the growing human population that consumes resources and discards waste at rates that have not been experienced in the past. In addition, the ability of the earth to sustain humankind is diminished by accelerated rates of deforestation, soil erosion and desertification and increasing levels of air and water pollution. Therefore, it implies that the increasing pace of human-induced environmental change is altering the ability of the environment to

provide essential goods and services, hindering progress towards sustainable development. Wanyama (2009:25) contends:

[E]nvironmental problems generated through most human activities create problems often with inherent risks that threaten the harmonious existence of humans, especially the most vulnerable with limited access to adequate material resources. These human activities interfere with the proper functioning of natural ecological systems, reducing the regenerative rates of such systems therefore lowering their capacity to supply natural materials upon which human depend, for example, water, soil, trees and forests. This phenomenon is most likely to lead to the shortage in the supply of material resources upon which human life depends, therefore threatening present and future generations.

Increasingly, environmental problems generated by most human activities are evident especially from the fact that the EE initiatives set to address these problems appear to have little success (Wanyama, 2009:25). The author points out that addressing these problems requires the cooperation of and collaboration by different stakeholders and social institutions in the community (Wanyama, 2009:26). Therefore, it implies that there is lack of cooperation and collaboration by different stakeholders. In general, it is clear that worldwide government actions have not yet reached a point of success in minimising or combating environmental problems as we are faced with environmental issues such as climate change, loss of biodiversity and high dependency on fossil energy (Rammel, 2003, cited in Maples, 2005:1).

According to Dalal-Claton *et al.* (2002:3), the results of the UN special session to review progress five years after the Earth Summit showed that the delegates were concerned about the continued environmental deterioration and social and economic marginalisation, while the successes reported in this regard are few, or they have caused other problems. The ineffectiveness of EE initiatives is caused, among others, by the gap between theory and practice (Azeiteiro *et al.*, 2004:17).

At this stage, it is important to evaluate the effectiveness of EE considering cooperation and collaboration by different stakeholders and availability of resources. It is important to evaluate the effectiveness of EE by different stakeholders.

Researchers identify problems and develop questions around these problems in an attempt to answer those questions. The researcher formulated the research questions for this study. The researcher developed and answered the main research question, from which more specific research questions were framed (Shank & Brown, 2007:108). Questions are mainly used because they create boundaries around the study (Marshall & Rossman, 2006:40). It follows that the research questions should be answered in the project to be performed (Babbie, 2007:289). The author further indicates that research questions are those questions to which the researcher really wants to know the answers. The researcher's aim was to answer the questions formulated for this study. Therefore, research questions are inquisitive in the sense that they warrant answers. To address the problem pertaining to the effectiveness of government and non-government EE initiatives, research questions need to be formulated based on the problem statement. The research questions are discussed in the following section.

## **1.9 Research questions**

The main research question and the sub-questions of this study were as follows:

### **The main research question:**

Are environmental education initiatives launched by the schools of Gauteng DoE, DWA and DEA and the City of Tshwane local government effective?

### **Sub-questions:**

- What ensures the effectiveness of EE initiatives?
- What causes the failure or leads to the partial effectiveness of EE initiatives?
- What can government departments do to ensure the effectiveness of EE actions in schools?

- What kind of training can be provided to government departments officials to ensure the effectiveness of EE actions?
- What role can a team of officials from various government departments play to ensure the effectiveness of EE actions?
- How can EE actions be managed so that they are effective and have a lasting effect?
- How can partnerships and collaborations with other entities make EE initiatives more effective?

### **1.10 Aim and objectives of the study**

It has already been mentioned that environmental problems pose a problem worldwide, which has called for world summits and global conferences in an attempt to address these problems. Although Agenda 21 (Sitarz, 1994:93) and the World Summit on Sustainable Development (Masondo, 2002:5) concur that governments should act to address environmental problems, it is fundamental at this stage to evaluate the effectiveness of EE actions that are employed by government departments.

The effectiveness of EE actions by government departments is essential and it should be given attention to ensure sustainable development. As mentioned earlier, the state of the environment is declining. Furthermore, we should preserve this world for future generations, as its safekeeping has been entrusted to us (Masondo, 2002:5). Future generations should also be afforded the opportunity to benefit from the same environment. According to Agenda 21, governments should strive to prepare strategies aimed at integrating environment and development issues into education at all levels, in cooperation with all segments of the society. This is supported by Masondo (2002:5), who indicates that the World Summit on Sustainable Development provided both the inspiration and the necessary momentum to intensify our own local government programmes well beyond the summit.

It is therefore clear that there is a need to implement EE programmes that are effective to ensure actions that will result in a good state of the environment. The aim of the study was therefore to explore how government can employ EE actions that are effective to increase environmental awareness that will enable present and future generations to

benefit from the environment. The study was embarked upon with the objective to determine the following in support of the research and sub-research questions identified:

- Causes of the failure or partial effectiveness of EE initiatives,
- The effectiveness of EE initiatives undertaken by government,
- The effectiveness of collaborations and partnerships between government departments,
- Whether government departments officials who deal with EE issues are trained in EE,
- What makes EE initiatives effective or not,
- The role a team of officials from various government departments can play to ensure effective EE actions and
- How EE actions can be managed so that they are effective and have lasting effects.

The motivation for the research follows in Section 1.11 below, because the researcher wished to formulate recommendations that might bring about an improvement with regard to governmental EE actions.

### **1.11 Motivating the research**

Government departments act according to the Constitution, parliamentary acts and policies. In addition, there are international agreements to promote the protection of the environment. These include, among others, the Constitution of the Republic of South Africa (2005), which laid the foundation for the inclusion of environmental issues in the curriculum; Agenda 21; the World Summit on Sustainable Development; the National Environmental Management Act 107 (2008), which relates to recycling; and the NCS (2002). The Constitution of the Republic of South Africa (RSA, 2005:11) provides a basis for EE. It states that:

Everyone has the right -  
to an environment that is not harmful to their health or wellbeing; and  
to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-

- prevent pollution and ecological degradation,
- promote conservation, and
- secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The Constitution states that the environment should be protected for the benefit of present and future generations and that pollution and ecological degradation should be prevented. This research could benefit the country, as the recommendations made by this research might result in providing guidance in terms of effective EE. The result of effective EE interventions at school level will be environmentally literate citizens who act responsibly with regard to the environment and therefore reduce their negative impact on the environment. EE activities can become viable and their benefits will be realised by present and future generations. Consequently, identifying and trying to solve environmental problems at local, national and global levels might enable people to address local environmental issues.

The expected results of this research are to develop guidelines:

- to establish government EE coordinating teams at national, provincial and district levels.
- for government officials from various departments to plan and implement jointly effective partnerships.

### **1.12 Research methodology and research design**

Elton-Chalcraft (2008:97) mentions that methodology defines how one will go about studying a phenomenon. Qualitative interviews are considered to be a useful technique along with personal observation (Babbie, 2007:305).

The author concurs with Babbie (2007:298) and Shank and Brown (2007:105) that qualitative studies usually aim for an in-depth rather than a superficial understanding. This means that qualitative researchers want to investigate the qualities and not the quantities of phenomena (Babbie, 2010:23). Many qualitative studies aim primarily at description, but may not be limited only to descriptive purposes and this means researchers proceed to examine why the observed patterns exist and what they imply

(Babbie, 2004:89). Rubin and Babbie (2013:63) states that in qualitative research, the researcher attempts to understand how people interpret their everyday experiences. Henning (2005:3–4) explains that in a qualitative study, the variables are usually not controlled, as it is precisely this freedom and natural development of action and representation that researchers wish to capture.

Researchers want to understand and explain an argument by using evidence from the data and from the literature, to determine what the phenomenon they are studying is about. It mostly describes and analyses people's individual thoughts, perceptions and social actions. This study investigated the effectiveness of government EE initiatives. The use of multiple techniques of collecting data was employed in this study, because the use of different methods may yield different insights into the topic of interest and increase the credibility of the findings. These techniques include observations, interviews and document analysis. This is explained further in Chapter 4.

A research design is the process of focusing the researcher's perspective for the purposes of a particular study (Babbie, 2010:117) while Babbie (2010:121) indicates that a research design offers an explanation of the choice of methods and what type of data the researcher aims at capturing. Babbie (2007:305) states that a research design in qualitative interviewing is interactive in the sense that the researcher repeat the processes of gathering information, analysing it, winnowing it until she come closer to a clear and convincing model of the phenomenon that is being studied, while Babbie (2010:318) indicates that design elements in qualitative research are usually worked out during the course of the study. The authors concur that a research design is continuous, and this applied to this study. This means the study was not rigid, but rather flexible to accommodate essential changes as the process continued.

### **1.13 Data-collection approach and methods and data analysis and interpretation**

As mentioned in Section 1.12, researchers strive to understand and explain an argument by using evidence from the data pertaining to the phenomenon they are studying. In this study, questions were used to collect data based on Babbie (2010:256) viewpoint that questions are research tools through which people are asked to respond to the same set of

questions in a predetermined order. Elton-Chalcraft *et al.*, (2008:97) and Babbie (2010:287) indicate that field research seek to answer questions. Data sources can be classified into various categories, such as face-to-face interviews, observations and documents (Babbie, 2007:73, 305 & 315; Smith, 2008:63). The above authors mention one or all of the data categories as data-collection tools that can be employed by the researcher who employs a qualitative approach, and these were used in this study. Qualitative researchers can overlap or use multiple techniques for collecting data (Rubin & Babbie, 2007:252). Accordingly, multiple techniques for collecting data were employed in this study.

### 1.14 Qualitative research approach

Qualitative research refers to the type of enquiry in which qualities, characteristics or properties of a phenomenon are examined for a better understanding and explanation of it (Henning, 2005:5). Furthermore, qualitative research uses description, exploration and explanations (Babbie, 2007:88–89). The researcher employed the qualitative approach to evaluate the effectiveness of EE initiatives by government departments and the City of Tshwane municipality, as the researcher, as a qualitative researcher, wanted to investigate the qualities and not the quantities of a phenomenon. The qualitative data-collection techniques, which included face-to-face interviews, participant observations and document analysis, are discussed below.

A qualitative approach to research has both strengths and weaknesses (Babbie, 2007:312–315).

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• It permits in-depth understanding.</li> </ul>	<ul style="list-style-type: none"> <li>• It is not an appropriate means for arriving at a statistical description of a large population.</li> </ul>
<ul style="list-style-type: none"> <li>• Measurements generally have more validity.</li> </ul>	<ul style="list-style-type: none"> <li>• Measurements generally have less reliability.</li> </ul>
<ul style="list-style-type: none"> <li>• It is relatively inexpensive.</li> </ul>	<ul style="list-style-type: none"> <li>• Some projects may require a large</li> </ul>

	number of trained observers.
<ul style="list-style-type: none"> <li>• It provides flexibility, allowing the researcher to modify the field research design at any time.</li> </ul>	

**Table 1.1: Strengths and weaknesses of the qualitative approach**

### **1.15 Research methods**

As mentioned above, various research methods were employed in this research. They are discussed in more detail below:

#### **1.15.1 Face-to-face interviews**

A qualitative interview entails the interaction between the interviewer and the respondent in which the interviewer has a general plan of enquiry (Smith, 2008:63). Qualitative interviews were used in this study, because the participants' responses were probed and elaborated on to achieve specific and accurate answers, as qualitative in-depth interviews are characterised by probing procedures and not by their particular question format (Babbie, 2007:289).

Interviews were used in the study, as they can generate detailed in-depth data, because where there is a trusting relationship between the interviewer and the interviewee it allows for personal or sensitive issues to be explored (Elton-Chalcraft, Hansen & Twiselton, 2008:92–93). The researcher interviewed the participants and recorded their responses, as this is sometimes deemed appropriate (Babbie, 2007:305). Tape recording is important because the researcher may not be able to capture and remember all responses given by the participants. The interviews were conducted based on the subset obtained through sampling.

Sampling is a special subset of a population that is observed for purposes of making inferences about the nature of the total population itself (Rubin & Babbie, 2013:175). According to Mason and Dale (2011:234) sampling is an example of generalisation. This

study employed sampling because generalisations were made based on the subset of the population that was used as representative of the rest of the population from which data were produced.

Generalisations refer to statements made on the basis of evidence that is local but which can be applied beyond the local context in which evidence for those statements has been assembled. This study used purposive sampling because it is a feature of qualitative research in which researchers select the cases to be included in the sample due to their judgment of their possession of the unique characteristics sought for (Cohen, Manion & Morrison, 2007:114–115). This means this study built up a sample that met the needs of the research. Shank and Brown (2007:127) explain that in qualitative research purposive samples are quite common and are often the desired mode of sampling. The authors further indicate that these types of samples are often target samples, which means specific participants are chosen because of their expertise, insights or access to information. The aspects of sampling considered in the study were population, sampling method, sampling criteria, sampling size, piloting of instruments and triangulation.

### **1.15.2 Observation**

Data for this study were also collected through observations, as was indicated earlier. This is because observations are more objective than interviews and objects analysis (Smith, 2008:62). Furthermore, observations are employed because they provide first-hand information on the phenomena under study. Henning (2005:98) explains: “Observing the context of discourse text is thus a way of ‘reading the world’ of the participants in addition to ‘reading’ their spoken or printed texts and the observation may explicate and also explain nuances of these texts” while Babbie (2007:45) says observation involves “actual observation, looking at the world and making measurements of what is seen”.

Observations were further employed because they provide an opportunity to write notes about what was observed, such as notes on body gestures. Photographs were also taken where necessary, for example of the gardens for the *BKB* campaign. The researcher made

full and accurate notes on direct observations because tape recorders and cameras cannot capture all the relevant aspects of the social process (Babbie, 2007:309).

### **1.15.3 Document-analysis**

Mason (2002:103) state that the analysis of documentary sources is a major method of social research and one which many qualitative researchers regards as meaningful and appropriate in the context of their research strategy. According to Henning (2005:99), documents such as portfolios, letters, photographs and memoranda of agreement are valuable sources of information for a study. As a major source method used in social research, documentary sources can serve as evidence to validate interviews, for instance. The researcher used written documents as one of the sources of information. The researcher analysed photographs of gardens, awards, profiles built as evidence for competitions and records of energy consumption as well as water conservation. In addition, the records included portfolios compiled for competitions, invitations to competitions, photographs taken before and after competitions, memoranda of agreement and letters. These documents were analysed to validate the information obtained through the interviews and observations.

## **1.16 Data analysis and interpretation**

Data analysis was done on an ongoing basis simultaneously with data collection across all stages. The qualitative data were analysed in the following manner:

### **1.16.1 Analysis and interpretation of data obtained from the interviews**

Data analysis can be very specific (Cohen & Manion, 2007:468). According to Cohen and Manion (2007:461) data analysis involves organising, accounting for and explaining the data and making sense of data with regard to the participants' definitions of the situation, noting patterns, themes, categories and regularities. Analysis and interpretation were done through the following actions:

- Transcription of data,
- Coding of data (grouping into similar and dissimilar themes),
- Building themes from similar ideas,
- Finding patterns and
- Synthesising data, concluding and making recommendations (Marshall & Rossman, 2011:53 207-215 and (Cohen & Manion, 2007:461).

### **1.16.2 Analysis and interpretation of data obtained from observation**

This relates to data that were observed from the natural field settings. Analysis of data was carried out after every session and began with the initial observations accessed at the observed settings.

### **1.16.3 Analysis and interpretation of data obtained from document analysis**

Gray (2004:320) advocates that qualitative researchers can use results from document analysis. The researcher used document analysis as a data-collection method to analyse documents such as portfolios, letters and memoranda of agreement.

### **1.17 Ethical concerns**

All research should be conducted with respect to ethical principles and practices (Hennink, 2007:33). Accordingly, this study observed research ethics such as privacy, confidentiality, anonymity and informed consent, as recommended by Babbie (2007:62–67), Hennink (2007:33–38), Marshall and Rossman (2011:122-123).

## **1.18 Definition of concepts**

Next, the key concepts for this study are defined to enable the reader to understand the message the researcher conveys without any possibility of misunderstanding, as stated by Hofstee (2011:88).

### **1.18.1 Constructivism**

Constructivism advocates that all knowledge is human constructs, how people methodically construct their experiences, worlds, and the contextual configurations of meaning and institutional that inform and shape reality-constituting activity (Holstein & Gubrium, 2013:255). Furthermore, a constructivist study how, what and sometimes why (Charmaz, 2006:131); Holstein & Gubrium, 2013:255).

Constructivism was also employed in this study because EE is a result of a human construct. On the other hand, codes were awarded, categories were constructed and a theory was composed. In qualitative approach knowledge claims are constructive assumptions in nature that use ethnographic design as a strategy of enquiry and observation as well as open-ended interviewing (Babbie, 2010:20 & 318). As this study employed a qualitative approach and interviews and observation methods to collect data, the knowledge claims were constructivist in nature, which accommodated subjective knowledge, positivistic and ethno-methodological paradigms (Babbie, 2007:294-295 & 300). Furthermore, the constructivist view postulates that knowledge, no matter how it is defined, is formed in the brains of persons and the thinking subject has no option but to construct what she or he knows on the basis of his or her own experience.

### **1.18.2 Collaboration**

Collaboration emphasises the process of interaction among actors (Hall, 1999, cited in Malan, 2009:1141). If collaboration emphasises the process of interaction among actors, it therefore means that actors should be together from the initial (planning) stage to the

last (monitoring and evaluation) stage. Collaboration is defined for this study as the interaction of a group of people through all the stages of EE action, which include planning, implementation, monitoring and evaluation to ensure achievement of the set goal and its sustainability. This simply means that collaboration of government officials in specific government departments should start from the planning stage to ensure the effective implementation of environmental actions.

### **1.18.3 Networking**

Networking is viewed by Gibson (2010:24) as a way of getting both governmental and NGOs to work together towards a common goal. The author refers to the Kansas City Environmental Education Network, which brings both governmental and NGOs together to work towards the common goal of helping to educate people in the Kansas City metro area and raise the environmental literacy of the region. This study defines a network as a strategy that allows various stakeholders of the community to work together in order to achieve a common goal.

### **1.18.4 Partnerships**

Malan (2009:1141) defines a partnership as adherence to the cooperative management model, while the Gauteng Department of Agriculture and Rural Development (GDARD) states that it is the establishment of mutually beneficial strategic partnerships to ensure collaborative management of the campaign. For this study, partnership refers to an agreement entered into by parties in order to achieve equal gains. The two definitions mentioned above agree on the concept of ‘management,’ although the first one is general in the sense that it talks about a model without being specific, while the second one is specific about a campaign, which is named *Bontle ke Botho*. Therefore, partnership in this study refers to a situation where people from different organisations, countries and government departments work together in order to achieve a common goal or solve a common problem.

### **1.18.5 Local level**

Local level refers to local districts or municipalities, which are the means to stage local Agenda 21 into action (Dalal-Clayton *et. al.*, 2002:16). The authors explain that Agenda 21 was developed at local level in over 6 400 districts or municipalities as a means to put Agenda 21 into action. In this study, the local level refers to the municipality, the district, the community and the schools, as these are levels at which EE actions take place.

### **1.19 Summary**

The state of the environment in South Africa is deteriorating due to the negative human impact on the environment. Conferences and world summits were held by various countries in an attempt to devise strategies with regard to addressing environmental problems. One of the agreements reached was that governments should strive to implement actions that address environmental challenges. Government departments in South Africa are engaged in EE actions. This includes departments such as the DEA, Gauteng DoE and DWA and the City of Tshwane municipality. While government departments in South Africa are engaged in EE actions, it is essential to evaluate the effectiveness of EE actions by the above selected government departments and to determine how such initiatives can be improved. A literature review follows in Chapter 2 with regard to evaluating the effectiveness of EE actions by government departments internationally.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

A literature review was conducted for this study to establish the national and international perspective on the topic under research. The literature review helps the researcher to:

- avoid duplication by establishing what is already known about the topic in which the researcher is interested (Mouton, 2008:87);
- establish boundaries for the researcher (Creswell, 2003:27; Swann & Pratt, 2003:190–191);
- convey to the reader what knowledge and ideas have been established on a topic, also showing their weaknesses and strengths (Taylor & Procter, 2006). It also shares the results of other studies that are closely related to the current study with the reader (Sowell, 2001:28) and helps the researcher to choose problems based on a study of the literature and to sharpen the problem statement.

The literature review was also conducted to establish international and national perspectives with regard to the study in question and the theoretical background on EE actions by government. A theoretical background on EE initiatives at international level is given. To conceptualise the effectiveness of EE actions by government, the collaboration of government department officials, partnerships with other entities and the training of government officials in EE in the selected departments were explored. Partnerships among government departments are discussed at both international and national levels, making use of case studies at international level. Partnerships at international level were reviewed because most environmental problems are holistic and pose a threat worldwide, therefore demanding a joint effort by countries of the world.

The private sector and civil societies should work together in partnership to achieve shared visions and common goals. This came as a lesson learnt from the effects in strategic planning for sustainable development in both developed and developing

countries over the past decade while evaluating successes and gaps and reasons thereof, and identifying actions to improve processes, mechanisms and the types of monitoring systems required to continue to learn in order to improve and ensure real progress (Dalal-Clayton *et al.*, 2002:ix). According to Dalal-Clayton *et al.* (2002:ix), it became clear during the preparatory process for the World Summit on Sustainable Development in 2002 that “the search for mechanisms to deliver sustainable development was in progress”. The UN Conference on Environment and Development (Dalal-Clayton *et al.*, 2002:3) called on all countries to develop national sustainable development strategies in 1992 through Agenda 21, and the purpose of developing national sustainable development strategies was to translate the ideas and commitments of the 1992 Earth Summit in Rio into concrete policies and actions. Countries had to work hard and come up with mechanisms that would ensure effective EE actions.

It is clear that worldwide governmental actions have not yet succeeded in minimising or combating environmental problems, as we are faced with environmental issues such as climate change, loss of biodiversity and high dependency on fossil energy (Rammel, 2003, cited in Maples, 2005:1). At a UN Special Session (Rio+5) to review the progress five years after the 1992 Earth Summit, delegates were concerned about continued environmental deterioration and social and economic marginalisation. Successes reported were fragmented or caused other problems (Dalal-Clayton *et al.*, 2002:3). The DEA (2009:2) supports this fact by indicating that “the state of the environment is deteriorating”. It is mentioned by De Lange (2004:28) that “man’s increasing demands have resulted in increased production that is often detrimental to natural resources”. The author refers to the book *Silent spring* published in 1962 in the USA, in which Rachel Carson documented the influence of agricultural chemicals on the rural environment of North America, such as song birds dying due to pesticide use.

Wanyama (2009:2) states that “in the last three decades or so since 1972, humans have responded to problems relating to socio-cultural and economic progress employing science and industry in various ways”. The author adds that “environmental problems are mainly a result of human activities, which include social, economic, political and cultural aspects”. One strategy entails creating awareness and training opportunities to address environmental problems through education in general and EE in particular.

EE initiatives by governments at both national and international levels pose certain challenges, as explained in Section 1.5 of Chapter 1. According to Dalal-Clayton *et al.* (2002:12), “both developing and developed countries are faced with problems with regard to preparing strategies for sustainable development”. They Dalal-Clayton *et al.* (2002:12) further indicate that governments urgently need to address several key uncertainties if they are truly serious about meeting international targets for sustainable development strategies. In addition, governments developed plans and policies to address environmental problems; however, there is a gap between theory and practice (Azeiteiro *et al.*, 2004:17). Wanyama (2009:30) agrees that there is a large contrast between theory and practice with regard to the implementation of EE. Reddy (2011:9) emphasises the importance of including EE in the formal curriculum, yet its implementation has often been described as less than ideal.

According to Dalal-Clayton *et al.* (2002:3), “the Rio+5 assessment led governments to set a target of 2002 for introducing national sustainable development strategies”, which they explain as follows:

*... at the Johannesburg World Summit on Sustainable Development in August-September 2002, governments again committed themselves to developing National Sustainable Development Strategies agreeing in the plan of implementation to take immediate steps to make progress in the formulation and elaboration of national strategies for sustainable development and begin their implementation by 2005.*

The progress review reveals that “there have been success stories, but they are fragmented, or they have caused other problems while sustainable development as a mainstream process of societal transformation still seems elusive” (Dalal-Clayton *et al.*, 2002:3). Harper (2005 cited in Maida, 2007:109) is of the opinion that “environmental issues do not discriminate because everyone is vulnerable and equally affected, whether poor or rich”. It is therefore important for countries of the world to share strategies in addressing these common problems.

The international perspective in terms of the implementation of EE initiatives by government departments is discussed below.

## 2.2 Environmental education initiatives at international level

Environmental concerns have led governments to engage in major international debates and discussions, which include the following:

- The Belgrade Charter of 1975,
- The Tbilisi Declaration in 1977,
- The World Conservation Strategy of 1980,
- The Moscow Environmental Conference in 1987,
- Publication of *Our Common Future*,
- The launch of the Brudlandt Report in 1987,
- The publication of *Caring for the Earth* in 1991,
- The Earth Summit and Agenda 21 in 1992, where nations deliberated on environmental challenges and some countries reaffirmed their commitment to addressing environmental problems,
- The conservation meeting in Canada in 1996,
- The *State of the World* report in 1997,
- The United Nations Environment Programme (UNEP) report in Nairobi, Kenya, in 1997,
- The Earth Summit +5 in Rome in 1997,
- The establishment of the UN inter-ministerial forum on the environment in 2000 and the Malmo Declaration and
- The World Summit on Sustainable Development in Johannesburg in 2002.

The engagement of governments in major international debates and discussions was aimed at coming up with ways of making people aware of humans' negative impact on the environment and practical ways to stop these negative impacts. The paragraph below indicates the degree of people's lack of knowledge of environmental issues.

Following the 2005 Roper Report, Mackenzie (2008:n.d.) mentioned that the knowledge of Americans pertaining to environmental issues is "embarrassing". This is because the report indicated that 45 million Americans believed that the ocean is a viable source of

drinking water; 100 million believed disposable diapers are the leading problem in landfills, while they only contribute 1% of what ends up in landfills with paper products as the fundamental problem in landfills; 10% realised that wildlife entanglement results from abandoned fishing lines and not plastic rings; while 55% thought that a lack of food rather than contaminated water causes most childhood deaths in the world (Mackenzie, 2008:n.d.). The author states that rather than simply providing students with the theoretical knowledge and having them read about the going green movement in the media, it should be ensured that they gain first-hand knowledge of the environment through experience, which provides them with a chance to see the green movement becoming a reality (Mackenzie, 2008:n.d.). This provides evidence of the fact that environmental actions by governments are not effective. It is imperative that governments consider coming with actions that will address these problems in a more effective manner.

The effectiveness of EE initiatives by governments at international level is discussed with particular reference to these countries: Mexico, Namibia, Brazil and Canada. The countries were selected to represent the international level because they came up with EE initiatives to address environmental problems. The countries were furthermore chosen for practical reasons, as the study could not cover all countries at international level. Governments are engaged in actions in an attempt to address environmental problems in their countries because these problems are a concern worldwide, as mentioned earlier. This idea is supported by Filho (2004:31), who asserts that “individual governments at central and regional levels should fulfil their responsibilities as the main providers of training in EE to complement the important social role that is played by NGOs”. In fact, NGOs are currently playing an important role in initiating and implementing environmental and development activities (Wanyama, 2009:11). At the 1992 Earth Summit, NGOs had a parallel meeting with the heads of state of member countries, where their powerful presence and activities paved the way for the inclusion of their views in the conference document, namely Agenda 21 (Wanyama, 2009:11–12). According to Wanyama (2009:31), “the EE programmes attract financial support from national governments, NGOs as well as the private and corporate sectors”. The author adds that “the material and financial support could be utilised maximally if the parties involved collaborated to benefit from the economies of scale thus reducing the cost of projects”.

However, “in practice collaboration is not happening, leaving schools to work in isolation of each other” (Wanyama, 2009:31).

Azeiteiro *et al.* (2004:14) declare that “the integration of EE and local initiatives take place in different forms in different settings”. Azeiteiro *et al.* (2004:14) indicate further that the socially constructed (and therefore socially, historically and geographically situated) nature of environmental issues implies a necessary context dependency for EE. UNCED (1992, in Simalumba, 2011:26) maintains that “education is crucial for promoting sustainable development and improving the capacity of people to address environmental and development issues, the idea that is shared by Agenda 21”. This implies that each country or region needs to develop policies, strategies and action plans, including targets, indicators and division of labour, at work for education for sustainable development. The four case studies that are now provided include the contributions made by NGOs. The concept of ‘NGOs’ no longer sufficiently describes the diversity of organisations outside government that have a stake in environmental and education policy, but the introduction of information and communication technology (ICT) has influenced social participation (Johnson & Mappin, 2005:78). Johnson and Mappin (2005:78) add that ICT has provided more new communication opportunities that enabled the public to engage directly in debating environmental issues. NGOs produce excellent teaching resources through websites, videos, computer software and printed material that are often available free of charge to schools (Johnson & Mappin, 2005:78).

The international case studies are considered in this study because environmental problems are a global issue. In addition, it was generally agreed in Rio that governments worldwide should take action to address these issues. This study deemed it necessary to evaluate the effectiveness of EE initiatives at international level with the purpose of benchmarking the progress made this far, learn the good practice, the ways in which problems were addressed as well as lessons learnt.

### **2.3 Case study 1: Mexico**

The first case study is on EE in Mexico.

### **2.3.1 Government: Department of Education**

Heimlich (2012:5-8) indicate that “EE in Mexico assumes many forms and plays a wide variety of roles”. The Mexican government took the initiative to integrate EE with other subjects in the curriculum, though it is at an early developmental stage in San Juan Nuevo, a small settlement in Mexico (Souz e, 2011:11).The author alleges that “despite this effort to include EE into the school curriculum there is a lack of EE programmes in San Juan Nueva”. Among the suggestions made by the study is that more EE programmes should be offered that include stewardship-based learning in partnership with the public school system, the Autonomous University of Mexico and the local government. This implies that the actions taken are lacking partly due to the lack of partnership with the school system, the Autonomous University of Mexico and the local government.

Another study was conducted by Barraza and Cuaron (2004:18) from the Universidad Nacional Autonoma de M xico. The purpose of the study was to analyse the familiarity and understanding of 10 environmental concepts among Mexican and English school children aged seven to nine, because hearing environmental terms does not necessarily mean understanding them. Furthermore, “the investigation considered the impact of the educational system and the school ethos on the formation of environmental concepts” (Barraza & Cuaron, 2004:18). The study was conducted with the sampled environmental schools that were actively involved in local, national and international environmental projects to evaluate the level of some environmental knowledge concepts. Ten environmental concepts were selected, namely habitat, pollution, recycling, global warming, deforestation, solar energy, endangered species, extinction, nuclear power station and ozone layer. In the first assessment, children were asked about their familiarity with the terms and whether they had heard the words before. Four options were offered: at school, by parents, on television, or in print such as newspapers, magazines and/or books. In the second exercise, children were asked to circle the correct answer from a multiple-choice format. Five options were given, including “do not know”. The information provided was about children’s knowledge of environmental words.

According to Barraza and Cuaron (2004:18), in general, the results revealed that “children had a low to moderate level of environmental literacy”. However, the results also revealed both strengths and weaknesses of the environmental projects.

**Strengths:** Children were familiar with words such as pollution, recycling, extinction, solar energy, endangered species and ozone layer.

**Weaknesses:** Mexican children from all schools tended to be unfamiliar and less likely to understand the meaning of some environmental concepts such as habitat, deforestation and global warming (Barraza & Cuaron, 2004:20).

The results show that the EE initiatives by Mexican schools were partially effective. Barraza and Cuaron (2004:18) indicate that “the development of effective environmental policies in schools needs to be considered in order to promote environmental knowledge in the school population”. It was mentioned earlier in Chapter 1 and in Section 2.1 that the one problem with effective implementation of EE is due to the gap between theory and practice (Azeiteiro *et al.*, 2004:17; Wanyama, 2009:30). A question can be asked regarding whether the development of EE policies in schools would yield better results than policies developed by the Ministry of Education.

The rural Mexican state of Queretaro is characterised by water pollution, soil erosion, deforestation and health problems (Monroe, 1999:74). A teacher training project was carried out by Consejo de Mejoramiento Ambiental, a group of communicators who began making printed journals and radio programmes for children in the northern portion of the state (Monroe, 1999:75). The need for teacher training is also alluded to by Azeiteiro *et al.* (2004:31), who declare “we need many more – and not fewer – teacher training programmes”. To promote EE in Queretaro, the group started a theoretical and practical teacher training course designed for primary teachers, jointly with university faculty members and government technicians, who collaborated with them from the beginning. Further indications are that locally based, relevant and culturally appropriate materials were well accepted by teachers and children alike. The project was later expanded to the rest of Queretaro, with the group focusing on teachers to help promote EE activities in their own communities.

The project benefits were the following:

- The mistrust of government agencies and messages based on the history of deception and corruption that led to few people trusting employees of the Ministry of Ecology or the agriculture public image was improved.
- Teachers and the communities learnt that technicians were involved in productive projects and had important information to share about environmental standards and protection.
- Support was given from a variety of sources such as the donation of paper for the materials by a local recycling factory.
- The Ministry of Education published the materials and distributed them to rural libraries. University faculty members had volunteered their time to teach and over 200 teachers had taken the course, while more were on the waiting list.
- Six course manuals had been published and three others were in a state of development, providing evidence of a changing environment in the community. In addition, more latrines had been built and more stoves were used as a result of the course (Monroe, 1999:75).

However, there were some impediments to EE in Querataro (Monroe, 1999:74), which included the following:

- Teachers with little background in environmental resources tend to avoid the natural science component of the primary curriculum, while environmental topics presented in the curriculum are often irrelevant for rural communities.
- Some teachers attended the course for an increase in their salaries and free materials (Monroe, 1999:75).

Teachers with little background in environmental resources may be one cause of the ineffectiveness of EE initiatives, as was explained in Section 1.7.1.1 (Bopape, 2006:102; Frohlich, 2004:88; Maila, 2003:38; Mudzunga, 2006:121). The issue of teacher training is essential for effective EE implementation, while the importance of collaboration from the beginning of the implementation of any environmental programme or project cannot be ignored.

A study was carried out in San Juan Nuevo (Souz , 2011:9). The aim of the study was to examine the communal forest enterprise (also known as La Comunidad Indigena) and EE in the Purepecha indigenous community of San Juan Nuevo (Souz , 2011:2). La Comunidad Indigena was initiated by the people of San Juan Nuevo and was formed in 1981. Further indications are that the settlement was established after the Purepecha people experienced the eruption of the volcano El Paricutin, which destroyed their homes. The volcano had a profound effect on the Purepecha people, which led to the exploitation of the communal lands without enforcement of regulations. Thirty years after the eruption the forest lands were destroyed and damaged by illegal logging, deforestation and fires started intentionally (Souz , 2011:27). It is indicated that “the exploitation of the communal lands reached a crucial level in the 1970s and has created inequality between the rich and the poor”.

Success had to be realised through yearly profits, employment for the members and transparency in the management of the enterprise, while benefits for the community had to be seen with direct improvements in living conditions, education and training (Souz , 2011:30).

According to Souz  (2011:33), “all the coordinators of the different productive areas reported to the manager, however, there was a lack of coordination amongst the main actors such as regulators, utilities and the government”. Furthermore, the fragmented approach together with the still fragile institutional setting precluded a strategic view regarding how to maximise the social benefit from EE. It is therefore important to ensure that there is collaboration and coordination when implementing EE programmes for involved parties to work collectively and effectively. The consideration of coordination regarding La Comunidad Indigena has contributed positively to the project as compared to the lack of coordination in Brazil regarding EE.

The La Comunidad Indigena project included the following successes:

- The mission of the enterprise to preserve and conserve the communal forest lands with sustainable development for the benefit of the community did succeed.
- It is the only communal forest enterprise with a Department of Technical Forestry in the state of Michoac n.

- The enterprise abides by Mexican forestry laws “in the development and management of their forest lands” (Souz , 2011:33).
- Research and the technological support from the Autonomous University of Mexico also benefit the enterprise.
- Guidelines for land and water resource management are provided by a regulatory institute within the federal government through the agrarian reform secretariat and natural resource and environment secretariat.
- The institutional revolutionary party assists in partnerships, alliances and access to government funding to support the enterprise, workers and the community (Orozco Quintero, 2006, cited in Souz , 2011:33).

The weaknesses of the project included the following:

- There was a lack of more involvement from the communal forest enterprise in the design and implementation of these programmes. Suggestions were offered for more EE programmes that include local indigenous knowledge, place-based education and stewardship-based learning in partnership with the public school system and the Autonomous University of Mexico, local government and the communal forest enterprise.

It is important for government to include all groups of people in the community in the decision-making process. This would help people to own the project and then help with effective implementation of government initiatives to address environmental problems, as this cannot be done by government alone. The participation of the Purepecha indigenous community of San Juan Nuevo in Mexico with regard to the conservation of La Comunidad Indigena is a good example of this type of initiative. EE is an important tool to make communities aware of the value of the natural resources in their lives, which can cause communities to preserve these resources. It is also important to consider local indigenous knowledge, the public school system, the universities and local government, which entails the collaboration of the stakeholders.

### **2.3.2 Non-governmental organisation**

Pronatura Sonora is an environmental NGO in the state of Sonora in Mexico (Lazcano-Ferrat, cited in Monroe, 1999:66). The organisation designed a public involvement environmental programme for the long-term management of coastal wetlands in which the public involvement and education programme led to a series of successful teacher-led projects in rural areas, covering 11 wetland systems in a coastal area of 540 000 hectares. According to Souza (2011:2), “the communal forest enterprise was involved with environmental education programmes for both students and residents”. However, non-formal EE activities throughout Mexico tend to be fragmented, as the NGOs serve their local areas with little strategic planning or coordination with other state or national efforts (Monroe, 1999:75).

## **2.4 Case study 2: Namibia**

The second case study is on EE in Namibia.

### **2.4.1 Government: Department of Education**

According to Simalumba (2011:2), Namibia has a draft EE policy document of 1999 to provide a blueprint for EE, developed by the Ministry of Education and Environment and Tourism working with the support of the Namibian Environmental Education Network (NEEN), which is a coordinating body for EE initiatives in Namibia. Imene (n.d.) states that Namibia is fortunate to have a government that is aware of the wise use and sustainable development of the environment, as stated in Article 95 of the Namibian Constitution which reads:

*The State shall actively promote and maintain the welfare of the people by adopting inter alia policies aimed at .... Maintenance of ecosystem, essential ecological process and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future.*

According to Simalumba (2011:24), “the Namibian government should develop an enabling environmental policy framework within which both regional and local activities can flourish in order to ensure the success of EE initiatives because some of the initiatives have experienced challenges”. Simalumba (2011:24) further alleges that the lack of LTSM severely hindered the implementation of environmental learning in Geography in Namibia, while Wagiet (2002:30) mentions that “inadequate access to appropriate learner teacher support material (LTSM) is a widespread problem, and the same problem occurs in EE”. Teacher training relating to the development of EE LTSM could assist in ensuring effective EE, as teachers would understand the LTSM they developed better than those that are developed by other people. Therefore, the initiatives taken in terms of integrating EE in the curriculum in Namibia can be compared to those of Mexico, which do not address EE effectively (Monroe, 1999:75).

According to Imene (n.d.: enviroteach project and environmental education in Namibia), Namibia has a programme called Enviroteach, which is an EE programme of the Desert Research Foundation of Namibia (DRFN) that started before EE was part of the curriculum in Namibia. Imene, (n.d.: enviroteach project and environmental education in Namibia), adds that the programme received substantial financial support from the Swedish International Development Cooperation Agency (SIDA) within the agreement of Namibia’s Ministry of Education and Culture (now split into the Ministry of Basic Education and Culture (MBEC) and the Ministry of Higher Education, Vocational Training, Science and Technology). “The project worked closely with the National Institute for Educational Development (NIED) in addressing environmental education issues” (Imene, n.d.: enviroteach project and environmental education in Namibia). NIED is a directorate within the MBEC that is spearheading the reform of the formal education system. Its responsibilities include evaluating, designing and developing curricular materials for the educational system, “introducing effective approaches to teaching and learning, coordinating the development of instructional materials and educational research” (Imene, n.d.: enviroteach project and environmental education in Namibia). Its two main divisions are curriculum research and development and professional and resource development.

According to Imene, (n.d.: enviroteach project and environmental education in Namibia), “when Enviroteach first started, EE was part of the curriculum, but was limited to a few

brief sections in certain carrier subjects, mostly geography and natural science”. Later on, the programme started to explore options for effective incorporation of relevant environmental information into formal education at primary and secondary levels, after which an agreement between the DRFN and the MBEC was signed allowing for the introduction of the enviroteach programme within formal education. Its main aim was to address the issue of EE through the educational reform process.

According to Imene (n.d.: enviroteach project and environmental education in Namibia) “the programme had undergone a number of phases each with its objectives with the overall aim of establishing EE in formal education”. A formal external evaluation was carried out at the end of each phase to evaluate the project and its objectives and to investigate the possibility for improvements. The programme consisted of a pilot phase, phases 1 and 2.

**The pilot phase:** The project pilot was first implemented as a three-year programme that tested the means and methods for integrating EE into the Namibian formal education system with two main components whereby the project’s focus was resource production and teacher assistance. To facilitate the two activities, 25 schools were sampled in each of the six educational regions of the country. The samples included both urban and rural schools and under- and adequately resourced schools. With regard to resource production, a number of books were developed, tested in the schools, revised and modified on a continuous basis. Ultimately, 10 Enviroteach books that were Namibia-focused were produced, which were cross-curricula and focused on a wide variety of environmental issues. The books were written from a holistic viewpoint, encompassing the social, economic and political aspects of the environment and were designed more as resource manuals than as textbooks, providing ideas for information, activities, projects as well as methods for implementation (Imene, n.d.: enviroteach project and environmental education in Namibia).

During this phase, the Enviroteach project investigated approaches in which EE could best be included in formal education by looking at two possibilities, first: the inclusion of EE in formal education as a distinct subject and separate subject or second: infusion/integration of EE across the curriculum. After careful study, the project chose the infusion/integration of EE across the curriculum. It is mentioned by Imene (n.d.:

enviroteach project and environmental education in Namibia) that the implementation of the plan had both successes and challenges, which are discussed below.

The successes of the plan were the following (Imene, n.d.: enviroteach project and environmental education in Namibia):

- It promoted the importance of EE “by equipping teachers and learners with skills and challenges involved in sustainable learning conducted through the project’s outreach component which provided EE materials and assisted teachers on how to use these resource materials”.
- EE was introduced as a cross-curricula theme within the broad curriculum through the outreach programme.
- It contributed to the reform process by promoting cross-curricula and learner-centred approaches to teaching and learning.

The weaknesses of the project included the following (Imene, n.d.: enviroteach project and environmental education in Namibia):

- There was resistance to change on the part of the teachers, school management, learners and parents.
- The teachers showed lack of confidence and experience.
- There was lack of support from school management, who in many instances did not understand new methodology being promulgated through educational reform.
- There was a lack of relevant, appropriate and user-friendly resources during the enviroteach pilot phase.

Resistance to change might have been caused by the fear to integrate EE, as the school management did not know what would happen, while the lack of confidence and experience on the part of teachers might be the result of a lack of training in EE, which would have empowered them. The management did not know how they could support the teachers, while they did not understand the new methodology. From the beginning, teachers should have been trained to develop relevant, appropriate and user-friendly resources. An independent evaluation was completed at the end of this phase where key players such as the project team, steering committee, MBEC and SIDA were interviewed (Imene, n.d.: enviroteach project and environmental education in Namibia) and the

conclusions were that the project could continue in three possible areas, namely continuing with resource production, formal education, teacher education (curriculum development, in-service and pre-service training) or non-education.

Mention is made by Imene (n.d.: enviroteach project and environmental education in Namibia) that, “after exploring all the possible options, the most effective route for immediate implementation of EE was that of teacher education specifically in terms of pre-service training, targeting four colleges of education”. According to Imene (n.d.: enviroteach project and environmental education in Namibia) this seemed to be the right approach for EE implementation, “as teacher education was going through a reform process to implement the new Basic Education Teachers Diploma (BETD) curriculum, and it was believed that this would reduce the degree of resistance to new issues in education”.

### **Phase 1: Investigating opportunities to implement Enviroteach in the colleges of education**

An investigation into how the programme could be implemented was conducted involving college rectors, teacher educators, reform educators and student teachers and they all supported the idea of implementing the programme at the colleges of education. However, Imene (n.d.: enviroteach project and environmental education in Namibia) points out that;

the college rectors were concerned about the lack of appropriate resources and support materials to implement the programme, the type or level of support to be given to teacher educators, the lack of qualified teacher educators relating to environmental issues and time planning within BETD programme to site but a few.

### **Phase 2: The implementation of the Enviroteach programme at colleges of education**

The programme was implemented at four colleges of education in 1996, based on the recommendation of the evaluation team. Phase 2 goals were to “sensitise teacher educators involved with BETD and student teachers enrolled for BETD to environmental

issues, and to encourage them to promote learner-centred education, activities-based lessons and cross-curricula approaches to teaching using environmental education at all levels of the formal system” (Imene, n.d.: enviroteach project and environmental education in Namibia). The author further mentions that the activities of the BETD outreach programme within the four colleges of education entailed conducting seminars and holding three main types of workshops, namely;

- a workshop to introduce the project to students and college lecturers,
- a thematic workshop that incorporated drama as a dimension to teaching and learning within a learner-centred approach and
- learner-centred support workshops with the aim of increasing the participants’ understanding of the enviroteach resources.

The phase-end evaluation was conducted in 1998. The outcomes reflected successes and challenges.

The identified successes were:

- The participants appreciated and recognised the value and relevance of the enviroteach resources.
- Materials were uniquely Namibian, providing participants with the opportunity to get to know their country.
- The materials enabled the teachers to obtain a broad understanding of their country and its environment from a social, political and economic point of view.

The following weaknesses were identified:

- The project’s sustainability was questioned.
- Little was done to involve teacher educators in the programme’s activities.

The evaluation recommended the following: “in the remaining period of the project, the project should seriously focus on the issue of sustainability by increasing the sense of ownership of all the major stakeholders taking part, through collaboration” (Imene, n.d.: enviroteach project and environmental education in Namibia).

### **The present state of the project: Institutional capacity building**

Enviroteach project activities were to conclude at the end of 1999 and the phasing-out actions focused on the transfer of ownership from the DRFN's enviroteach EE programme to the ministry through relevant officials at NIED. As the links between NIED and the enviroteach project have not been as strong as in its previous phases due to the fact that the project was operating from Windhoek, which made planning so difficult that it often collided, it was resolved that before the end of the project, enviroteach should begin to work in close partnership with NIED officials. The project started operating from NIED infrastructures, including housing the project advisor and staff. The purpose was to coordinate the smooth transfer of ownership to the colleges and ministry. Moving the project to the NIED and the appointment of the EE advisor were part of the project's successes. Rundu and Ongwediva Teacher Training Colleges developed strategies regarding how they could acquire ownership of the EE activities based on the results of the evaluation team's visitation to those colleges.

### **The future of environmental education in formal education**

In conclusion, enviroteach had a fundamental influence in the development of EE in Namibia. Training of people implementing EE remains core to effective EE. According to Simalumba (2011:135), "there is a lack of EE centres in Namibia, a sector that is viewed as having the possibility for linking and networking of clubs at local and national levels". The author continues stating that the centre should support schools by providing resources and professional learning opportunities to educators (Simalumba, 2011:134). The lack of EE centres may be one of the factors that led to the ineffective implementation of EE in geography teaching in Namibia.

### **2.5 Case study 3: Brazil**

The third case study highlights EE initiatives by the Brazilian government.

### **2.5.1 Government**

Morimoto (2012a) declares that “environmental education faces a challenge particularly with regard to preparing people for participation in the decision-making process and finding solutions to making the application of laws feasible rather than making them more flexible without considering the consequences”. The author continues to comment that “the social, environmental and economic problems that we face today present new challenges to environmental education. This means social problems such as poverty can bring along environmental education challenges in places that are poverty-stricken”. For example, the lack of money to build infrastructure such as toilets and to pay for electricity can cause the affected communities not to consider embracing EE. An alternative to the lack of infrastructure such as toilets may cause people to use the open field as toilets while the lack of electricity may lead to cutting trees (deforestation) for energy. Deforestation might exacerbate environmental problems such as climate change, which has become a global challenge for the whole world.

#### **Local initiatives**

According to Iared and De Oliveira (2012:129), the Sao Carlos Ecological Pole projects (São Carlos, São Paulo, Brazil) are environmental spaces believed to be able to contribute towards an understanding of complex environmental issues. The main aim of the project was to integrate the various existing educational initiatives for the development of coordinated EE work and to integrate environmentally relevant administrative units in order to jointly conduct an effective and contextualised work of diffusion of EE, constituting an ecological corridor between their natural areas. Identified units are situated in urban areas in the city while providing an opportunity for both “residents and visitors to connect with the natural environment” (Iared & De Oliveira, 2012:129). The units comprise of the local zoo, municipal botanical gardens, which include a plant nursery and ecological trail, the municipal Organic Vegetable Garden, the municipal utility of Espraiado (water extraction), an experimental farm and a nature trail inside a public university. The units were run by the municipal and federal government and a municipal utility (Iared & De Oliveira, 2012:129). The authors mention that, “all EE activities were performed without any benefiting form of a common programme of EE

that could exploit the complementary character of the work” (Iared & De Oliveira, 2012:129).

Research was conducted by Iared and De Oliveira (2012:130) with the aim of evaluating whether the units of São Carlos Ecological Pole are educating spaces and whether the EE work developed has contributed to the understanding of the complexity of environmental issues and stimulated a sense of belonging and social responsibility. They interviewed primary school teachers who had accompanied visits to the units and members involved with EE in these spaces and followed guided tours in all units of the Ecological Pole. The researchers realised that activities could address issues that “espoused the three dimensions of educational practice namely: cognitive (knowledge), subjective (feelings, principles, ethics) and political, and that jointly, the sites could be able to espouse all parameters considered essential in a valid EE work than working in silos” (Iared & De Oliveira, 2012:130). It is worth noting that since the mid-1970s, Brazil had a number of proposals for incorporating educational activities related to environmental issues as extra-class activities (Iared & De Oliveira, 2012:132).

The successes of the Ecological Pole project can be summarised as follows (Iared & De Oliveira, 2012:131):

- Activities that have been conducted in the spaces contribute essentially to the regional EE.
- EE activities in urban green areas have the advantage of approximating the population and the local reality.

The weaknesses of the project included the following:

- Educational activities conducted in the spaces were isolated.
- Concern regarding the different EE pedagogical discourses.

González-Gaudio (2002, cited in Iared & De Oliveira, 2012:132) believes that “the management of biodiversity is a complex issue requiring mobilization of people in individual and collective levels”. The idea is shared by Fracalanza (1991) and Manzochi (1994) (cited in Iared & De Oliveira, 2012:132), who state that “the concepts in ecology are treated in a disconnected manner in both textbooks and classrooms”. Manzochi’s

(1994, cited in Iared & De Oliveira, 2012:132) states that extended study to extra-class activities showed the same trend.

Four municipal entities were involved in the project, namely:

- São Carlos, a municipality in the state of São Paulo with two public universities, an experimental farm of the Brazilian Enterprise for Agricultural Research and a track record of EE, which was the result of partnerships among various local institutions.
- The Municipal Botanical Garden, which includes a plant nursery and an ecological trail founded in 1953 to produce seedlings for trees and gardens in the public areas.
- The Municipal Organic Vegetable Garden, which produces vegetables without using pesticides or fertilisers, is also structured to produce and supply medicinal plants and receives school field trips.
- The Municipal Zoo called São Carlos Ecological Park. The main objective of the zoo is the “ex situ” conservation of South American fauna. It contains about 630 specimens of animals, more than 93 different species many of which are endangered. The municipality also has an environmental education centre that receives schools and other visitors from São Carlos and neighbouring cities.

It is in most cases believed that access to information means making people aware of environmental aspects and as Mayer (1998) and Sauvé (1999) cited in Iared & De Oliveira, 2012:139) discuss, historically, knowledge of the subject was never proven an effective strategy for EE work a conception that must be overcome, as it is not conducive to deep reflection on the issue in question. Iared and De Oliveira (2012:139–140) agree that “the EE programme identified and the description of natural components and understanding of the phenomena of nature are basically essential”; however, they mention that “the functional nature dimension should be regarded as a means required to understand reasons and causes of the processes of interaction present in the wild”. Furthermore, in 2009 during VI Iberoamerican congress on environmental education several papers on field activities were presented. However, it was noticed that several experiments did not treat the visit to such places as a punctual activity (Iared and De Oliveira, 2012:142). This followed the international meeting for education applied to conservation and sustainability organised by the zoo of São Paulo where several

experiences of educating spaces such as botanical gardens, zoo, nurseries and aquarium in which there occur educational activities about environmental issues were presented (Iared and De Oliveira (2012:142).

### **2.5.2 Non-governmental organisation**

The evaluation of long-term effects of the Golden Lion Tamarin Environmental Education Programme in Brazil was initiated by the Associação Mico Leão Dourado (AMLD) education centre in 1983 (Engels & Jacobson, 2007:3).

According to Engels and Jacobson (2007:4)

although education alone will not solve environmental problems effective educational programmes are a pre-requisite for better natural resource management and public support, measurable by the participation in and satisfaction with the programme and by positive behaviour changes toward environmental conservation is essential for the success and continuation of such programmes.

The aim was to conserve adequate forests to ensure a naturally sustainable tamarin population by the year 2025 (Engels & Jacobson, 2007:4). The reason is that when the tamarin population increases, they need larger tracks of healthy forests to protect them against diseases, natural disasters and human disturbances.

The programme targeted students and teachers from local schools, visitors to the AMLD education centre, regional landowners and members of the surrounding communities. The project was carried out through training workshops for elementary school teachers, providing school presentations during educational campaigns, environmental holidays and special events, while visitors could watch informational videos, listen to presentations and walk through an interpretive trail and an exhibit. This study reveals both successes and challenges, as was pointed as per the responses of 666 residents and results from four focus groups interviews.

The successes included the achievement of greater citizen awareness, public support and knowledge of general environmental information (Engels & Jacobson, 2007:11).

Weaknesses included continued deforestation, declining knowledge about the social family structure of the tamarind and lack of specific knowledge about the biology and conservation of the tamarin population.

The AMLD used EE to increase participation in conservation activities by increasing local knowledge and concern for the importance of protecting an endangered species and its forest habitat. This is because the study suggested that charismatic species such as the golden lion tamarin attract more people to support conservation initiatives as compared to the general approach to conserve ecosystems.

For effective implementation of EE in schools, teachers should be trained in EE. This will enable them to gain more knowledge about the environment, acquire the necessary skills to address environmental problems and have a positive attitude towards the environment, which will ultimately be taught to learners. The community can also be trained about the importance of the natural resources that are useful in their lives, as they can play an important role in addressing environmental problems.

## **2.6 Case study 4: Canada**

The fourth case study is on EE in Canada.

### **2.6.1 Government: Department of Education**

The Canadian government took an initiative to implement EE by infusing it in the curriculum. Mayer-Smith *et al.* (2009:107) engaged in Environmental Education Project with the purpose of illustrating how eco-philosophies could be translated into educational programmes that foster environmental consciousness and care, and to further the critical and systematic examination of EE initiatives. The project involved elementary school children and community elders who worked as partners.

While teachers' philosophies and approaches evolved over the course of the project, some teachers held firmly to the curriculum agendas they believed were supported by the schools where they taught (Meyer-Smith *et al.*, 2009). The involvement of teachers and elementary school children shows the involvement of the Canadian DoE in EE. The government has also assisted the project through funding and in-kind support through the Department of Curriculum Studies and Pedagogy, the Faculty of Education and the Faculty of Land and Food Systems. Despite the existence of support for, and an interest in EE, "EE will remain marginalised in the existing education system unless the schools can blur the disciplinary boundaries created by the existing curricula" (Mayer-Smith *et al.*, 2009:118). Mayer-Smith *et al.* further mention that "teachers and environmental education providers need to work together on a regular basis to create curricula opportunities that build on experiential learning and integrated school experiences". This means that there should be continuous collaboration between teachers and environmental education providers to ensure the effectiveness of EE initiatives.

## **2.7 Summary**

Chapter 2 provided the background and literature review regarding the implementation of EE initiatives at international level. This was done focusing on the four selected case studies, which highlighted the initiatives conducted in the selected cases, their successes and weaknesses. The findings in terms of successes and weaknesses at international level are important to study since they provide South Africa with an overview of what is happening in other countries in terms addressing environmental problems since they are common worldwide. The EE initiatives at national level are discussed in Chapter 3.

## CHAPTER 3

### ENVIRONMENTAL EDUCATION INITIATIVES AT NATIONAL LEVEL IN SOUTH AFRICA

#### 3.1 Introduction

Chapter 2 reported on the literature review conducted to review EE initiatives at international level. This chapter reports on the literature search conducted to establish the national perspective of the topic under research. A theoretical background on EE initiatives at national level is given. The discussion below outlines the role of the South African government in implementing effective EE initiatives. Three government departments and the City of Tshwane municipality were selected as a case study at national level.

This chapter provides a brief explanation regarding why the three departments and one municipality were selected for the case study at national level. Furthermore, this chapter presents literature that is relevant to this study, which includes the Constitution of the Republic of South Africa, selected acts governing government departments and curriculum policies with regard to the integration of EE into the school curriculum. Other relevant literature that is presented is documentation on the cooperation between government departments and partnerships between government departments and NGOs, resulting in programmes/projects in schools such as the *Baswa le Meetse Award*, *Aqua Enduro*, *Working for Water* and *Bontle ke Botho*.

The Constitution of the Republic of South Africa is essential for this study, as it focuses (amongst others) on the Bill of Rights, which guarantees the environmental rights of the citizens and provides the fundamentals of conservation in as far as addressing environmental problems in the country is concerned (RSA, 2005:11). The government acts governing environmental management are explained briefly in section 3.6. Actions by each of the selected departments are also discussed in this chapter, because the aim of this study was to determine their effectiveness in implementing environmental initiatives.

### **3.2 Selecting government departments to participate in the research**

The reason for focusing on government departments and in particular selected departments was for practicality, because government decisions are implemented by its departments, also at local level (Dalal-Clayton *et al.*, 2002:16; Masondo, 2002:5). Governments at national level mainly develop the Constitution and policies and laws that are implemented at local levels such as communities, districts, schools and/or local municipalities (Dalal-Clayton *et al.*, 2002:16). Implementation does not take place at national level. Furthermore, the samples were chosen because of their high participation in and in-depth knowledge of the phenomenon in question. These are the departments that work with the Gauteng Department of Education (GDoE) mainly at school level to implement EE projects/programmes, as are highlighted later in this chapter. The aim of this study was to explore how government departments can employ EE actions that are effective to enable the present and future generations to benefit from the same environment. The researcher is an employee of the GDoE, has worked for more than 20 years in this department and is interacting actively with officials from other government departments and partners with regard to the implementation of environmental projects and programmes. She is also a facilitator for Social Sciences in which environmental content is covered by the subject of Geography.

It was mentioned earlier that an agreement was reached in Rio de Janeiro in 1992 with regard to the fact that all countries should address environmental problems through their governments. The following are some of South Africa's responses to environmental challenges/issues: promulgation of environmental laws, development of national policies, implementation of management strategies, and monitoring and research to ensure sustainable development (DEA, 2009:2).

### **3.3 Theoretical framework**

This study sought to evaluate the effectiveness of EE initiatives by selected government departments, namely the GDoE, DWA and DEA and the City of Tshwane municipality. The set of issues that constitutes a framework for planning research needs to be interpreted differently for different styles of research; however, it is essential to indicate

what those issues might be (Cohen *et al.*, 2007:78). This study sought to review the effectiveness of EE initiatives by the selected government departments of South Africa, including investigations into the CAPS, *Groen Sebenza*, *BKB*, *Aqua-Enduro*, *Working for Water*, *the Baswa le Meetse Award* and the *Eco-Schools* programmes. This analysis was situated within the scope of grounded theories and constructivism, which are discussed below.

According to Cohen *et al.* (2007:491), “[g]rounded theory is a general methodology for developing theory that is grounded in data that was systematically gathered and analysed”. Grounded theory provides a systematic way of constructing theories that illuminate human behaviour (Babbie, 2007:296). The whole process of data collection and analysis is a tightly-woven interactive process involving continual comparison which leads to gradual development and refinement of theory grounded in the data. This means with grounded theory data analysis begins during data collection in which a theory is developed and continues to be shaped (Cohen *et al.* (2007:491). In grounded theory the researcher does not separate data collection from data analysis.

Creswell (2003:14) declares that with grounded theory the researcher attempts to derive a general, abstract theory of a process, action or interaction grounded in the views of participants in a study. In addition, this process involves using multiple stages of data collection and the refinement and interrelationship of categories of information (Charmaz, 2006:20 & 21). According to Creswell (2003:14) the design has two characteristics which are the constant comparison of data with emerging categories and theoretical sampling of different groups to maximise the similarities and the differences of information. Of utmost importance is that grounded theory is generated or grounded in the data from participants who have experienced the process.

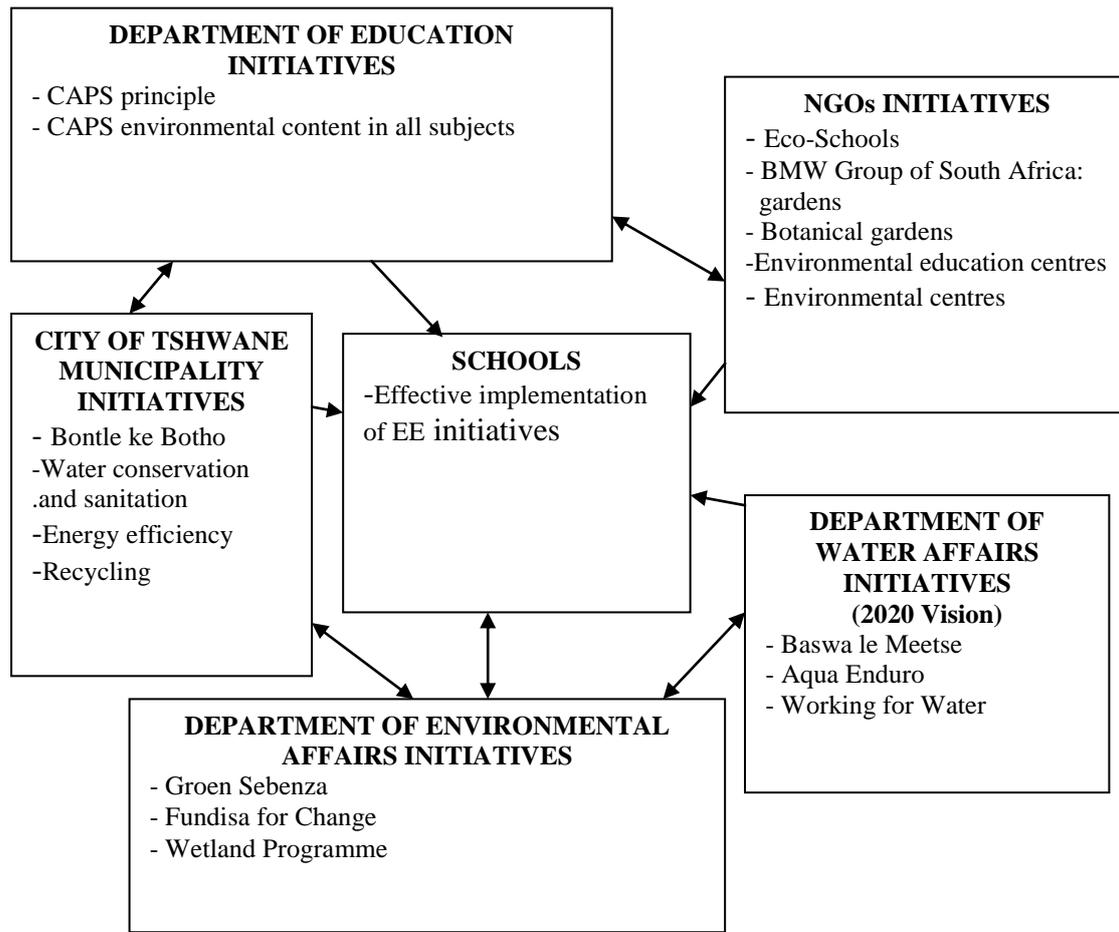
Creswell (2003:140) states that in qualitative research inquirers employ theory as a broad explanation much like in quantitative research, such as in ethnographies while theories also appear as an end point of a qualitative study, a generated theory, a pattern, or a generalisation that emerges, for example, generate a theory “grounded” in the views of participants and place it as the conclusion of their study.

Grounded theory was employed in this study because theory generation is a characteristic of qualitative approach that is employed in this study. In addition, grounded theory was employed in this study because the researcher attempts to derive a general, abstract theory of a process, action or interaction grounded in the views of participants in this study. The theories emerge from the data rather than having existed before. Theories for the study were generated from the collected data, which are analysed in Chapter 5.

Charmaz (2006:130) describe constructed knowledge as a position that views all knowledge “as contextual and based on experience”. Charmaz (2006:130) notes that “constructivist analysts see data analysis as having been created from the shared experiences of the researcher and participants and the researcher’s relationships with participants”. In this study, the researcher wanted to understand the meaning people attach to the effective implementation of EE while finding meaning, awarding codes, constructing categories and composing theories as she came into contact with data. This study employed constructivism, as EE is a result of human construct, while data were collected through interviews, observation and document analysis.

Constructivism centres on an understanding that knowledge is constructed both out of experience and existing knowledge, meaning being in the world and knowing the world. In addition, a constructivist view posits that knowledge, no matter how it is defined, is in the brains of persons and the thinking subject has no option but to construct what he or she knows based on his or her own experience (Charmaz, 2006:130).

The importance of understanding the factors that lead to the partial or complete failure in implementing EE initiatives by selected government departments namely the GDoE, DWA and DEA and the City of Tshwane municipality, which is central to this study, is strongly tied to the need for effective collaboration of these organisations in order to achieve effective implementation and sustainable results. Figure 3.1 below presents a diagrammatic illustration of the theoretical framework of this study.



**Figure 3.1: Theoretical framework**

Figure 3.1 illustrates effective collaboration among the government departments and the City of Tshwane and partners, which is crucial in implementing effective and sustainable EE initiatives. Each of the three departments and the City of Tshwane has at least one arrow that point at the block that indicates schools. This means that these departments and the City of Tshwane implement their initiatives in schools which require effective collaboration amongst the departments and the City of Tshwane. The fundisa for change programme’s purpose is to train teachers on environmental issues, the NGOs programmes such as the *Eco-Schools*, *BMW Group of South Africa*, *Botanical gardens*, *Bontle KeBotho* *Baswa le Meetse* and *Aqua Enduro* for example implement their initiatives in schools as the arrows indicate. On the other hand some arrows point at two departments, for example an arrow between the DEA and DWA. The departments collaborate on working for water and wetland initiatives. The DoE is the lead department because is the vehicle towards addressing environmental problems and schools are expected to have sustainable initiatives.

The relevance of grounded theory to this study is to generate or discover a theory or a unified theoretical explanation regarding the effective implementation of EE initiatives by government departments and the City of Tshwane municipality. The theoretical framework for this study is based on the theory that effective collaboration in implementing EE initiatives by government departments, the City of Tshwane municipality and partners, effective professional development, monitoring and evaluation and availability of LTSM will lead to the implementation of effective and sustainable EE initiatives.

### **3.4 The expected role of governments**

Governments expected role in South Africa is to implement its decisions effectively in terms of EE actions. According to Hargroves and Smith (2005:228) government is a reasonably well understood human institution in which there is a valid base for the belief that it has an especially crucial role given sustainability's long-term horizons, often non-local implications and strong public good aspects. During the World Summit on Sustainable Development, the plan was for governments "to intensify their own local government programmes well beyond the world summit" (Masondo, 2002:5). Governments should while addressing environmental problems come up with effective and sustainable environmental education initiatives.

In South Africa, government promulgates environmental acts that are placed under the jurisdiction of the DEA. In addition, the DEA prints wetlands charts and distributes career booklets, among other things, while the DoE integrates content that addresses environmental issues into the school curriculum (DoE, 2002). In South Africa actions to address environmental issues take various forms, which include among others the development of policies, inclusion of EE in the curriculum, engagement in programmes/projects, partnerships and networks, as well as collaborations.

On the other hand, the DWA developed EE programmes, which include the 2020 *VFWSEP* (DWA, n.d.:9–10). The *BKB* campaign was initiated at local level in 2002 by the City of Tshwane municipality after the World Summit on Sustainable Development

(GDARD, 2011/2012). The EE initiatives by government departments are discussed in more detail later in this chapter.

This is an indication that even though EE decisions and actions were taken, much was to be done at local level by government departments, the GDoE and municipalities if local governments were to strengthen their efforts. Environmental initiatives are implemented at school level by the GDoE in collaboration with other departments at national, provincial and municipal levels. Unlike the GDoE, the DWA and DEA implement their initiatives at national level through schools at school level. Government departments are also expected to collaborate to ensure effective implementation. This issue was highlighted earlier in this chapter, when Malan (2009:141) was cited who maintains that “proper interaction and co-ordination among government departments in the management of the environment is crucial if individuals and institutions wish to honour the principles of co-operative government and intergovernmental relations”, as spelled out in Chapter 3 of the Constitution of South Africa 1996 and the concomitant legislation.

Government departments, especially in a democracy, are important stakeholders in science communication and education for a number of reasons, which include:

- Responsibility to establish and maintain national education standards for the development of citizens with knowledge and skills to meet the future needs of society.
- International treaty obligations to develop national education programmes for a number of environmental protocols, such as Agenda 21 and the Kyoto protocol.
- The obligation to engage the public in decision making or policy development. This means government agencies play a crucial role in influencing public understanding of ecology through mandated school curricula and environmental policies (Johnson & Mappin, 2005:76–77).

Mention has been made earlier of the multiple environmental threats in South Africa that also have global dimensions, such as air, water and land pollution; waste management; urbanisation; loss of biodiversity; depletion of the ozone layer; and climate change, with disasters such as floods and a deteriorating state of the environment. The occurrence of these environmental challenges makes it imperative for governments to act. Agenda 21

advocates that governments should prepare strategies to address environmental problems. Governments have pledged themselves to rhetorical policy positions (Hargroves & Smith, 2005:226). Hargroves and Smith (2005:228) state that:

Government is a reasonably well understood human institution and there is a valid base for the belief that government has an especially crucial role, given sustainability's long-term horizons, often non-local implications and strong public good aspects. Integrated, whole government approaches are needed to achieve complete responses to sustainability.

### **3.5 The Constitution of the Republic of South Africa**

The point of departure for governments to respond to environmental challenges should be the development of environmental policies and laws. South Africa has implemented this quite extensively. The various South African government departments developed their legislative framework based on the Constitution, which lay the foundation for addressing environmental challenges. The Constitution Twelfth Amendment Act (RSA, 2005:11) in Chapter 2, the Bill of Rights, stipulates that everyone has rights to the environment as indicated in Section 1.11.

In terms of the Bill of Rights, the environment should be protected to ensure an environment that is not harmful to the health of people and that both the present and future generations can benefit from the same environment. This should be done through legislative and other measures, which may include collaboration. Importantly, the environment should be protected from pollution and ecological degradation, while conservation is promoted and ecologically sustainable development is secured. Therefore, the use of natural resources should be considered. The Constitution Twelfth Amendment Act, Chapter three (RSA, 2005:25) indicates that "in the Republic, the government consists of national, provincial and local spheres that are distinctive, interdependent and inter-related". This research study was conducted with consideration of both the national and the local spheres of government. Chapter 2 of the Constitution's Twelfth Amendment Act has laid the foundation for the selected government departments to be engaged in EE

actions. One of the Agenda 21 agreements mentioned in Chapter 1, Section 1.1 states that governments should strive to prepare strategies aimed at integrating environment and development issues into education at all levels in cooperation with all segments of society. Government's environmental theoretical legislative framework is explained briefly below.

### **3.6 Environmental legislative framework**

Following the foundation laid by the Constitution of the country, the South African government has developed various acts in an attempt to address environmental issues, as was mentioned in the previous chapter. These include the following: the Environment Conservation Act, Act 73 of 1989, the Water Services Act, Act 108 of 1997, the Marine Living Resources Act, Act 18 of 1998, the National Water Act, Act 36 of 1998, the National Environmental Management Act, Act 107 of 1998; the Biodiversity Act, Act 10 of 2004; the National Environmental Management: Air Quality Act, Act 39 of 2004, the National Energy Regulator Act, Act 40 of 2004, the Electricity Regulation Act, Act 4 of 2006, the National Environmental Management: Waste Management Act, Act 59 of 2008; and the National Environmental Management Act, Act 62 of 2008.

The regional policy with regard to the environment or EE relates to the Millennium Development Goals and the New Partnership for Africa Development, which emphasise the environment as an important component through which poverty can be dealt with on the African continent (Wanyama, 2009:256). This viewpoint is held by the DEAT (2007:82), which states, "while policy and legislation are, broadly speaking, in place, implementation and enforcement have been inadequate, particularly at provincial and local government levels, where numerous constraints hinder progress with regard to sustainable development". A discussion of certain government departments and the roles they play in implementing EE initiatives follows below.

### **3.7 Government departments and the role they play in environmental education**

Government departments play an important role in the implementation of EE actions (Johnson & Mappin, 2005:76–77). The inclusion/integration of environmental issues in the school curriculum was considered during the introduction of C2005 in South Africa through the phase organiser “The environment,” when it was decided that environmental awareness should be taught in all the learning areas/subjects (DoE, 2005).

The idea of integrating environmental issues into the curriculum was also evident in the NCS through learning outcomes and assessment standards (DoE, 2002). Currently, CAPS embraces environmental issues in its content (DoBE, 2011). A further government obligation is to engage the public in decision making or policy development (De Lange, 2005:29; Johnson & Mappin, 2005:77). The rationales for the initiatives include the following:

- Leaders in believed that real environmental progress can only be achieved with the participation of the citizens concerned.
- Ensuring public consultation will enhance public acceptance and support for the decisions to be taken.
- It will enable more informed and accountable decisions to be taken and greater consensus to be attained.
- It will facilitate the implementation of environmental legislation.

Above all, education is considered to play a critical role in addressing environmental problems, which is in agreement with Agenda 21, which regards education as the vehicle to address environmental concerns.

### **3.8 The Department of Environmental Affairs**

The DEA is the leading department regarding the protection of the environment. Concern for the environment and EE has been taken further through the National Environmental

Management Policy (NEMA) and the National Education Policy (through the National Qualifications Authority and the NCS). According to the DEA (2009:2):

Increasing pollution and declining air quality are harming people's health. Natural resources are being exploited in an unsustainable way, threatening the functioning of the ecosystems. Water quality and the health of aquatic ecosystems are declining. Land degradation is a serious problem.

### **3.8.1 The Wetland Programme**

To promote environmental awareness and education, the DEA prioritised a school-based EE programme as well as a community-based environmental awareness programme (DEA, 2002). Accordingly, World Wetlands Day is observed on 2 February of each year as an effort by government to ensure the protection of wetlands by communities and schools. Furthermore, the DEA print charts in celebration of World Wetlands Day and distributes them to schools in collaboration with the City of Tshwane municipality. It is indicated that the wetlands cover a wide stretch of inland and coastal habitats, such as mountain bogs, fens and midland marshes, forests and estuaries, linked by green corridors of stream bank wetlands. It must be noted that wetlands are important in South Africa as many of the plants found there have medicinal value, and almost 70% of people use traditional medicine for primary healthcare. According to the DEA (2012), the wetlands provide some of the 19 500 tons of medicinal plant material, which are used by some 28 million South Africans every year.

It is therefore essential that wetlands are protected and conserved to ensure their sustainability. Besides providing medicinal plants, wetlands are the habitat of various species (Dilley, Proctor & Weldon, 2007:134; Walter Sisulu Environmental Centre, 2011). If well-managed, they become recreational places and therefore contribute towards the economy of the country and provide jobs, for example Isimangaliso, formally known as the St. Lucia Wetland (Rainbird Educational, n.d.).

### **3.8.2 Environmental career guidance**

Although the DEA ensures the implementation of environmental laws, it addresses issues such as the loss of biodiversity, recycling and conservation of wetlands that are brought to the attention of learners in schools. This is done through the Directorate: Sector Education, Training and Development. Undoubtedly, the importance of integration of EE in formal curricula is indisputable; however, its implementation has often been explained as less than ideal or below potential (Reddy, 2011:10). The DEA (2009) published a booklet with the title *an introduction to careers* to encourage learners to follow environmental careers. Importantly, this booklet refers to various careers that focus on the environment and is distributed directly to schools. In the following section, this study seeks to investigate the effectiveness of the department's actions.

### **3.8.3 The DEA 2012/2013 annual report**

According to the DEA's 2012/2013 annual report concerning EE and awareness, focusing attention and resources on improving EE and awareness is essential to ensure the building of an informed society in which individual citizens understand their role with regard to protecting and conserving the environment. The department conducted 108 workshops on environmental career development, while 198 unemployed youths were recruited for EE training development practice leadership working in partnership with various municipalities within the country (DEA, 2013:23).

The implementation of EE programmes poses a challenge in many countries. In his EE study that compares South Africa and Tanzania, Wanyama (1999:2) states the following:

The two countries have experienced ineffective implementation of programmes in the community or through schools and have increasingly become a big concern because of the financial costs of conducting them and the apathy among targeted community members that emerge from them as an outcome.

Therefore, it is essential at this stage to evaluate the effectiveness of EE implemented by the South African government. DWA initiatives are discussed below.

### **3.9 Department of Water Affairs**

According to the DWA, South Africa is a water-scarce country, but most of the citizens are not aware of this situation (DWA, 2010:9 & 10). The DWAs' responsibility is to ensure that people have clean water and the department has embarked on a number of programmes to conserve and diversify its water sources, such as desalinating seawater in coastal areas and increasing effluent recycling. Another programme is the 2020 VFWSEP. The 2020 VFWSEP includes activities such as the *Baswa le Meetse Award*, the *South African Youth Water Prize*, *Aqua Enduro*, *Working for Water* and curriculum support and intervention (DWA, 2010, 2013 & 2014).

The DWA has embarked on strategic education programmes with the purpose of educating society about the management and sanitation of water resources. This is because global water problems have continued to escalate and to affect the quality of life of billions of people (Etgen, Tindamanyire, Nelson & Fuller, 2009, cited in Blokland, Alaerts & Kaspersma, 2009).

South Africa is no exception, being a water-scarce country, hence the introduction of the 2020 VFWSEP. Educational resource materials have been developed, reviewed and implemented since 2010. The aim is to enable educators to implement water and sanitation activities as spelled out in the curriculum. The new curriculum requires learners to be engaged in intervention projects, which promote their active participation and enable them to solve problems related to water, sanitation and invasive alien plants.

Other activities include celebrations of special environmental days, such as National Water Week, Arbor Week, Sanitation Week, Weed Buster and World Monitoring Day, which provide support to educators to enable them to implement water and sanitation activities within the school curriculum and promote careers in the water sector. The objectives of these activities include imparting knowledge on integrated water management, water use efficiency, protection of water sources, health and hygiene and

invasive alien plants; encouraging participation by learners and communities in the management of water resources and sanitation; and making informed decisions. Further objectives are empowering learners and enabling them to transfer knowledge and water-management skills to their parents and communities, imparting knowledge about alien invasive plants and their impact on the sustainability of water resources, and encouraging learners to choose careers in water resource management and sanitation.

The main goal is to teach learners to take care of the environment's resources, in this case water resources, to enable future generations to enjoy the same resource and ensure a good quality of life.

The activities mentioned above teach communities and learners to manage water resources. Water forms part of the CAPS for some grades in schools, for example in Grade 4 Geography (DoBE, 2011:24). Below are discussions of each of the 2020 VFWSEP activities:

### **3.9.1 Baswa le Meetse Award**

This is a ministerial project that was launched in 2003. *Baswa le Meetse* (Youth in Water) is a national competition held in all nine provinces of South Africa with one winner from each province. The aim of the *Baswa le Meetse Award* is to recognise the role of young people in educating the society about integrated water management, sanitation and health (DWA, 2011:13).

The DWA believes that if it educates the youth about water conservation issues, the youth will communicate this information further in the communities in which they live and ultimately the nation. The approach entailing participation of the youth can be effective, because the youth have not yet engaged in activities that affect the environment negatively. They can spread the message in good faith and make a positive impact. However, survey results demonstrate that water education is not applied consistently across the globe and within countries, and several challenges are experienced with regard to water education Etgen *et al.* 2009, cited in Blokland *et al.*, 2009:221). The *Baswa le*

*Meetse Award* is divided into five categories, namely drama, traditional music, poetry, praise poetry and posters.

Art is regarded as a powerful tool to educate the society about water, sanitation, invasive alien plants, health and hygiene. Winners are eligible for prizes that benefit both the learners and the schools, on condition that a report detailing expenditure of the cash prize should be forwarded to the Ministry of Water and Environmental Affairs. In this case, collaboration between government and the private sector is evident, because the sponsors of the *Baswa le Meetse Award* at national level include corporate companies such as MTN-SA, ABSA and AVIS.

Etgen *et al.* (in Blokland *et al.*, 2009:221) state that the project on water education tools conducted a survey to address the lack of information with regard to water education in communities/schools across the globe. Etgen *et al.* (in Blokland *et al.*, 2009:223) reveal that “the current global recession has tightened most state budgets”. This project covers evaluation of the *Baswa le Meetse Award*. Funding was listed as a fundamental barrier by half of the water survey responses with regard to providing water education in schools and lack of cohesiveness of water curricula around the world. The lack of sanitation hampers school attendance, which leads to the lack of access to EE, especially for girls who are absent from school during their menstrual cycles, while lack of knowledge of water issues by professionals is one of the greatest barriers to water education. Therefore, it means that professionals too need knowledge about water issues. It is important at this stage to evaluate the effective of this action in South Africa.

### **3.9.2 Aqua Enduro**

*Aqua Enduro*, just like the *Baswa le Meetse Award*, “is a project to implement the aims of the 2020 Vision for Water and Sanitation Education Programme” (DWA, 2010a). Importantly, it is indicated by the DWA (2010:10b) that the project promotes careers in the water sector. The programme targets Grade 9 to 11 learners who are studying mathematics and science (DWA, 2010a). Learners enter a competition by participating in the *Aqua Enduro Youth Summit*. They first compile a portfolio about any topic of their

choice relating to water, for example water quality management (water testing) or water use efficiency. Ten learners participate in the compilation of the portfolio, after which six learners are selected to participate orally at provincial level. These same learners will then proceed to the national level where they compete individually by writing a test and in a team by participating in games.

The competition activities also include testing water quality and building dam models as reservoirs. The aim of the department is to instil interest in learners to pursue careers in the water sector as early as from secondary school level onwards. Interested learners should have their own environmental project in the community with the help of the principal to make people aware of the usefulness of the environment to them, for example, to celebrate Arbour Day, when trees are planted in the community. Importantly, winners are awarded scholarships that enable them to pursue careers in the water sector in order to ensure that South Africa has future water engineers and scientists. Evaluation of the effectiveness of this action in South Africa is essential at this stage.

### **3.9.3 The Working for Water project**

According to the DWA (n.d.(c)), invasive alien plants, water-related issues, integrated waste management, climate change and biodiversity are integral components of EE in the curriculum. There are 198 alien species that are listed as declared weeds and 36 species identified as potentially invasive (Henderson, 2001:4). Addressing alien plants has been indicated as one of the objectives of 2020 VFWSEP.

The DWA promotes awareness among school learners and communities of invasive alien plants through the *Working for Water* project as part of the 2020 VFWSEP (DWA, 2010:2b). Furthermore, the DWA aims to integrate awareness of invasive alien plant species, climate change and biodiversity in the curriculum (DWA, n.d.(c)). This is done in collaboration with the DoBE. Teacher conferences are arranged to provide teachers with an opportunity to present contributions on various environmental issues under the main theme “Working together to promote sustainability” to address alien plants as one of the objectives of 2020 VFWSEP, as mentioned earlier. Conference themes include the

impact of invasive alien plants on social livelihoods / natural environments / water systems, climate change / global warming, biodiversity, water conservation and waste management.

In 2010, the conference was hosted by the Limpopo province. All nine provinces in South Africa gave presentations (Gamanie, 2010:2). If well-managed, these conferences could assist the DoBE with including environmental issues such as biodiversity and climate change in the curriculum as part of the content in subjects.

Learners are taught by teachers about the negative impact of alien invasive plants with regard to the sustainability of water sources as part of the 2020 VFWSEP. Alien plants have a negative impact on the sustainability of water resources because they consume large amounts of water per day when compared to indigenous plants. The question can be asked whether all schools from the nine provinces were involved and whether what was presented at this conference still continues at schools. Actions by the DoBE are discussed below.

### **3.10 Department of Basic Education**

The DoBE provides environmental content to be taught in schools through formal education which is categorised into three levels, namely Foundation Phase, GET and FET

Formal education from Foundation Phase to FET for basic education is implemented through the NCS, which is gradually being replaced by CAPS to integrate environmental issues in its contents (DoE, 2002:n.p.). The aim of the DoBE is to develop the full potential of all learners as citizens of a democratic South Africa. Furthermore, it seeks to create a lifelong learner who is confident and independent, literate, numerate, multi-skilled and compassionate, with a respect for the environment and the ability to participate in society as a critical and active citizen (DoE, 2002:n.p.). This idea is supported by Vukenkeng (2005, cited in Fomin & Forje, 2005:22) through their study that aimed to examine the role of school EE. They emphasise that the youth must be made aware and an understanding must be created of the serious consequences of human activities for the environment, in order to be able to appreciate the need to avoid such

activities or adopt new ones that will minimise those consequences and to become better advocates for environmental protection.

According to UNCED (1992, cited in Simalumba, 2011:26), “EE is crucial to promote sustainable development and improving the capacity of people to address environment and development issues”. EE is regarded by Agenda 21 as a critical strategy to raise public awareness and training that is linked to all areas. As indicated earlier, one of the principles of Agenda 21 is that “the government should strive to prepare strategies aimed at integrating environmental and developmental issues into education at all levels done in cooperation with all segments of the society” (Sitarz, 1994:93).

The DoBE provided content that addressed environmental issues through the learning outcomes and assessment standards (to be replaced by specific aims and skills in CAPS) as spelled out in the NCS grade R-12/CAPS policy documents. Environmental issues should be integrated into the curriculum and be taught in every learning area and subject. Environmental issues are taught from the Foundation Phase to FET. The content taught includes the sustainable use of resources, development issues, water, waste management, climate change, as well as the impact of mining and manufacturing on the environment (DoE, 2002:49–51, 71).

Nevertheless, the integration of environmental content in teaching and learning is a challenge. According to Wagiet (2002:30), “inadequate access to appropriate learner teacher support material (LTSM) is a widespread problem and the same problem applies to EE”. This viewpoint is shared by Maila (2003:38), Mudzunga (2006: 121) and Bopape (2006:102), who state that schools face various problems concerning the use of LTSM, the most common ones being availability, quality and use of LTSM. These authors also point out that teachers lack the time, resources and often the skills to develop their own resources. Successful implementation of EE depends on adequate access to appropriate LTSM by both educators and learners. A report of a review committee on the implementation of C2005, released on 31 May 2000, identifies the lack of LTSM as one of the hindering factors for successful implementation of this curriculum (DoE, 2002:n.d.). Collinson *et al.* (2009, cited in Reddy, 2011:20–21) states that “nations, including South Africa, have left policy implementation to practitioners who may have had little or no communication with policy makers”. Collinson *et al.* (2009, cited in

Reddy, 2011:20–21) adds that “top-down policies may fail because practitioners have not been given the reasoning behind new policies or linkages to existing practices.”

Following the above-mentioned facts, it is evident that government, through the DoBE, is committed to develop citizens who respect the environment. Therefore, every learner in each grade should be taught about environmental issues. Accordingly, the department considers and implements one of the Agenda 21 principles that states that EE should be implemented through formal and non-formal means. A partnership is one of the strategies used to expand the department’s efforts to provide EE. Although collaboration occurs within government departments, non-formal education is ensured through external partnerships with NGOs, especially in communities. The GDoE interacts with EE centres such as Mogale’s Gate in Hekpoort, near Maropeng, and the environmental centre at the Walter Sisulu Botanical Gardens near Krugersdorp as NGOs in partnerships. Furthermore, the DoBE works jointly with the *Eco-Schools* programme.

### **3.10.1 The Eco-Schools programme**

*Eco-Schools* entail a programme that is implemented through schools, therefore requiring a partnership with the DoBE to implement it effectively. In South Africa, the *Eco-Schools* programme is managed by the Wildlife and Environmental Society of South Africa (WESSA), in partnership with World Wild Fund of South Africa (WWF-SA), with support from Nampak. It is worth noting that the *Eco-Schools* EE programme in South Africa is implemented by WESSA, which may mean that the programme has the flexibility envisaged and has become popular with other players (Wanyama, 1999:355). The programme has been developed as a school improvement project aiming to achieve sustainable environmental management (Loubser, 2008:57–58). Importantly “an *Eco-Schools* community engage in practical actions to improve environmental conditions in schools such as planting a food garden or recycling their waste” (O’Donoghue & Oliver, 2008:25). Furthermore, “possibilities are that food gardens and practical projects may be used as the basis for the integrating environmental education into the school curriculum (Midlands Meander Association Education Project, 2013).

The programme began in 1994 as a response to needs identified at the UN Conference on Environment and Development that was held in Rio de Janeiro in 1992 (Eco-Schools programme, 2012:3–11). After being developed, the programme was piloted by the Foundation for Environmental Education with the support of the European Commission. It is further reported that, “while covering various aspects of sustainable development and building ties with the community, the programme extends learning beyond the classroom and develops responsible attitudes and commitment, both at home and in the wider community” (Eco-Schools programme, 2012:3–11). This is an international programme for EE and environmental management. The programme’s aim is to raise awareness of sustainable development issues through classroom study as school and community actions (Eco-Schools programme, 2012:3–11). It encourages children and youths to be active in running their school for the benefit of the environment whereby they also participate in discussion and decision-making processes, which result in *Eco-Schools programme* being a useful tool for citizenship education. The programme caters for both primary and secondary schools without denying other school categories and education-related organisations participation. A school should follow the following seven steps to become an Eco-School:

### **Step 1: Establish an *Eco-Schools* committee**

The goal of the *Eco-Schools* process is that the committee should organise and direct *Eco-Schools* activities. The committee comprises various stakeholders within the school setup, which include parents, the school governing body, educators, learners and cleaners. This provides an environment where everyone owns the process, thereby ensuring effective participation.

### **Step 2: Environmental review**

This is a stage during which evaluation of the environment is done to identify areas that need attention.

### **Step 3: Action plan**

An action plan is developed based on the identified needy areas. The plan sets achievable targets and due dates to attend to areas that need attention.

### **Step 4: Monitoring and evaluation**

It is important to identify challenges and attend to them to ensure effective implementation rather than waiting until the process is complete, which may cause delays in terms of due dates.

### **Step 5: Curriculum linking**

Eco-Schools activities should be aligned to the curriculum, in particular the topics taught in the classroom such as on energy efficiency, prevent littering and conserving water.

### **Step 6: Informing and involving the wider community**

The recognition and involvement of all stakeholders, local or external, are critical for good results. This will enable the school to benefit from skills and experiences as well as resources from such people. It is essential that stakeholders are informed through meetings, media and notice boards.

### **Step 7: Eco-code**

The school is awarded a Green Flag after a year of implementing the programme and attaining a high level of performance with regard to the above-mentioned six steps. In some countries, the Green Flag is the culmination of a multi-level system that includes bronze and silver flags and the Green flag. Assessment is first conducted through a site visit prior to receiving the first Green Flag (Eco-Schools programme, 2012:3–11).

The introduction of its activities has been greatly interpreted by most schools as a social intervention programme that is intended to augment the school feeding programme. Walls and Heymann (2004, cited in Wanyama, 1999:346) criticise a homogeneous approach to

sustainable development. The authors, in terms of what they call “singularism”, argue that the conflicts inherent in the interaction of the diverse and the similar, and in the similar and the diverse, are the basis of building sustainable ways of living, and similarly schools that focus on similar activities (in most cases copied from the practice of others) deny themselves the opportunity to look for authentically local solutions for their particular situations. According to Walls and Heymann (2004, cited in Wanyama, 1999:362), “the fact that most schools seem to be engaged in more or less similar activities attests to the shallow understanding of EE and what those involved, particularly educators and school management, think of the *Eco-Schools* programme.

The programme has been criticised for over-emphasising the award scheme, which causes a shift in focus from education processes to the production of food to supplement the feeding scheme in schools. In addition, it has at times provided an opportunity for unscrupulous businesses that would adopt a school to benefit from government tax relief, and then abandon the school as soon as adoption has been officially recognised by government (Wanyama, 1999:346). When interviewed, one of Wanyama’s (1999:337) participants, who were a teacher from a high school in Tembisa township, responded in the following manner:

The NGOs involved in the implementation of environmental programmes need to involve teachers more actively and provide support through ongoing development programmes in environmental activities, which build us and make us feel that we can do it. Otherwise, teaching EE for most of us is tricky, frustrating and sometimes intimidating. What most teachers do now is just dig gardens, plant vegetables for them to come and see. This will die as soon as the programme is over, i promise you.

The response from this teacher reflects the frustration teachers experience regarding the implementation of EE by both NGOs and the Gauteng Department of Education. The approach employed by the NGOs and the Gauteng DoE is worrying and not acceptable to the teachers. The fact that teachers’ contributions are not allowed by the NGOs and the Gauteng DoE has discouraged teachers. Teachers are left frustrated without confidence

and resort to developing gardens, which are discontinued as soon as the project is over. The ineffectiveness of EE by NGOs and the Gauteng DoE in question is a worrying factor, because money is wasted in these programmes while environmental issues will remain unaddressed.

### **3.10.2. Examples of Eco-Schools programmes**

#### **Midlands Meander Association Education Project: Hawkstone Primary School**

Midlands Meander Association Education Project (MMAEP) engages schools in improving the environment (Dell, 2010:1). The aim of the project is to facilitate the integration of EE and training programmes into the school curriculum (Dell, 2010:1–5). Through this project, teachers at the Hawkstone Primary School located in KwaZulu-Natal are encouraged to use the environment as a resource when teaching EE activities. The rural school's ground provides good material to teach biodiversity. As indicated earlier, the emphasis is on the wise use of resources, creativity, sustainable living and community building.

The MMAEP is a sophisticated programme that helps 114 teachers at 15 schools registered in the WESSA/WWF-SA *Eco-Schools* programme to integrate EE into the curriculum. It is indicated that “the project has inspired an interest in the natural environment and its protection amongst both school children and the communities from which the children are drawn” (Dell, 2010:5). School teachers are encouraged to use the school grounds as a learning resource for lessons on topics such as biodiversity, water cycles, indigenous, vegetation, renewable energy, and climate change. MMAEP fieldworkers are referred to as “The Bugs”. According to Dell (2010:5), “[l]earners have developed an attitude of caring towards nature, we educators have been influenced by the teaching style of The Bugs and now we bring the environment into everything, all subjects, even mathematics”.

This project also seeks to ensure that young people view the EE sector and related fields as valuable career options and to mentor and train enthusiastic young people. Organisational assessment shows the following strengths and weaknesses of the MMAEP:

Strengths of the MMAEP include the following:

- In terms of form and content, the project followed international good practice.
- It has successfully supported 10 rural schools to achieve Eco-Schools status in 2008.
- The project has sufficient internal controls and financial oversight in place to ensure project transparency and accountability.
- Five schools that were previously supported by the MMAEP were implementing environmental activities without any external assistance as part of their Eco-Schools portfolio.

Weaknesses of the MMAEP include the following:

- The organisation employs qualitative project evaluation with little tracking and measuring of change.
- It lacks formal and regular controls and reporting systems as it is a small-scale EE initiative part of a bigger organisation.
- Sustainability of the recycling project at the school after the external support is withdrawn might be a challenge (MMAEP, 2013:1–5).

It is essential to research how many Eco-Schools are effective in implementing and sustaining the above-mentioned activities as well as their affiliation as Eco-Schools. This study explored how the partnership is managed by the *Eco-Schools* programme managers and the DoE after the agreement was entered into. The study assesses the effectiveness of the EE programme in South African schools and the sustainability thereof.

This is an indication that government departments are engaged in activities that address environmental issues through partnerships.

### **Monde Primary School**

The Monde Primary School is also one of the *Eco-Schools* that have managed to comply with the new curriculum/NCS in terms of incorporating EE into the mainstream. According to Exposing learners to environmental issues (2007:1) in the article titled

“Exposing learners to environmental issues”, learner and teacher involvement in the *Eco-Schools* initiative has assisted them to gain knowledge, skills and values relating to environmental issues within their environment. It is mentioned that learners are able to cook food using solar cookers and harvest rainwater to sustain gardens, and also understand the causes of waste and the need to reduce it. Mention is further made that both learners’ and teachers’ attitudes have changed, as they now value and love their environment. The Gauteng Regional Coordinator observed on the day Monde Primary School celebrated its third Green Flag as follows: “This school is now meeting the goals of the new Curriculum Statement, by producing the citizens of the future who can make well-considered decisions” (Exposing learners to environmental issues, 2007:1).

Partnerships therefore add value with regard to teaching learners environmental issues. At this stage it is important to assess the effectiveness of these actions in South African schools. The *Eco-Schools* that are involved in the project were invited to participate in the annual HSBC eco-code climate competition, which addresses various environmental themes that include energy, transport, waste, water and biodiversity in terms of climate change. It is mentioned that “the environment and innovation project’s intention is to encourage *Eco-Schools* to come up with innovative and creative solutions for environmental problems by allotting grants that allow ideas to be put into practice” (Eco-Schools programme, 2012:3–11).

### **3.11 Local governments and their roles in environmental education**

The South African Local Government Association represents local government on numerous inter-governmental forums, for example the Budget Forum, the National Council of Provinces and the Financial and Fiscal Commission. This implies that local government is responsible for budget issues relating to, for example, the *BKB*, the programme that addresses EE through the establishment of *medicinal gardens*, *energy efficiency* and *recycling*.

### **3.12 Cities and municipalities involved in environmental education**

All cities and municipalities within Gauteng participate in EE through the *BKB*. These cities include, for example, Johannesburg, Tshwane and Ekurhuleni, while the municipalities include, for example, the Tshwane Municipality, the Ekurhuleni Municipality and the Mogale Municipality (City of Tshwane, 2005a:5; Masondo, 2002:5).

### **3.13 The role of municipalities: City of Tshwane municipality**

Municipalities in South Africa are committed to address environmental issues in an attempt to implement the National Environmental Management Act 107 of 1998. The *BKB* campaign is implemented by building partnerships based on sound governance and transparency. This study focused on the City of Tshwane municipality. The City of Tshwane municipality was chosen for practical reasons and because of its level of participation in EE actions. According to the City of Tshwane (2005b:14), Subsection 24(1) of the National Environmental Management Act provides that:

In order to give effect to the general objectives of integrated environmental management, the potential impact on the environment, socio-economic conditions and cultural heritage of activities requiring authorisation by law and which, significantly affect the environment, must be considered, investigated and assessed before they are implemented and reported to the organ of state charged by law with authorising, permitting or otherwise allowing the implementation of the activity.

The City of Tshwane (2014:1) states that “participating in the *Bontle Ke Botho* campaign requires the initiation of environmental projects that address thematic areas such as sustainable agriculture, water and energy conservation, litter, waste management and greening”. Sustainable agriculture is implemented through projects such as *Dirang Ka Natla* in Ga-Rankua and the *Phomolong* Clinic Food Garden in Atteridgeville.

Water conservation involves tips on how to use water efficiently; as the country receives an average annual rainfall of 500 mm. Repairing broken appliances is encouraged instead of throwing them away and buying new ones. Communities and schools are advised on for example how to fix leaking taps, taking short showers or shallow baths, reusing water and not leaving taps open in an attempt to conserve water.

The *BKB* campaign encourages communities and schools to engage in energy saving projects and the use of alternative clean, renewable and affordable energy. The Balebogeng Primary School in Mamelodi uses *BKB* solar water heater. The *BKB* campaign also encourages communities and schools to participate in a waste recycling project. This includes collecting and recycling items such as bottles, cans and newspapers. The campaign's target group is wards and schools. Its message is that we can create a beautiful environment for the people to live in and a better quality of life for all by contributing to the cleaning and greening of schools and wards. Contacts details of recycling organisations are provided by the municipality to schools (City of Tshwane, 2010b:11). Primary schools and wards in Tshwane participate in this competition and prizes are awarded for schools and wards that develop good gardens and have clean school yards or wards. *BKB* forms part of the key performance areas for the municipality staff who handle environmental issues. The officials should conduct seven workshops for schools within Tshwane GDoE districts (City of Tshwane, 2010:6). The discussions of community EE awareness follow below.

### **3.14 Community environmental education awareness**

One of the themes was sustainable living with topics that included sustainable agriculture, water conservation, energy efficiency, greening, litter and waste management. The City of Tshwane is also implementing the Tshwane Integrated Environmental Policy. It is through this policy that the local municipality is conducting internal and external environmental awareness campaigns and education. According to the City of Tshwane (2005c:17), “education and public awareness is an integral part of sustainable development and an important part of a community's understanding of environmental impacts and how these relate to their actions” and “the lack of knowledge by community members can cause the degradation of the environment”. Examples of the internal

environmental awareness and education actions implemented by the municipality include appropriate high-quality training and awareness interventions for the municipal staff to enable them to integrate environmental considerations into decision making and to display effective duty of care and providing formal training and skills development, where necessary (City of Tshwane, 2005b & 2005c:17).

External actions include promoting awareness of the legal requirements in terms of the environment and activities that are undertaken and regarding the environmental rights of communities and individuals, promoting the education of traditional healers regarding sustainable harvesting and cultivation practices of medicinal herbs and educating communities and industries “on the economic value of natural resources and urban systems and on their role in ensuring sustained service delivery, provision of basic needs and economic opportunities” (City of Tshwane, 2005b:17).

Raath, Stone and Van Heerden’s (n.d.:68–79) conception of school gardens is in agreement with the conception of the Dell (2010:5) that schools should have gardens for food production or decorative purposes. The City of Tshwane (2010a: 4–5) also supports the idea of food gardens. The authors regard gardens as an act that contributes positively towards the environment. Raath *et al.* (n.d.:68) have this to say: “In South Africa gardens should be dealt with on two levels, namely decorative and food gardens”.

The above quotation concurs with the meaning of *BKB*, which is “being beautiful is being human”. In an attempt to encourage communities to care for the environment, the City of Tshwane has introduced the idea of sustainable agriculture. Sustainable agriculture involves growing crops and protecting the environment at the same time. Communities are encouraged to use organic food gardening methods. Such projects include the *Itereleng* agricultural project in Mamelodi, the *Kutlwano* agricultural project in Soshanguve, the *Dirang Ka Natla* project in Ga-Rankua, and the *Phomolong* clinic food garden project in Atteridgeville. These projects deal with gardens, particularly food gardens. Therefore, the City of Tshwane is indeed engaging communities in greening the environment.

It has been indicated that learners from a school in South Africa, namely Pace College, Skype to communicate with learners from a school in Germany, Uhlandeschule, to compare how much electricity their schools uses, in an attempt to save energy and

preserve the environment. The learners for example switch off the lights and other appliances after school to observe whether they save energy, and results are then compared between the two countries' schools. The *BKB* campaign encourages communities and schools to engage in energy-saving projects and to encourage the use of alternative clean, renewable and affordable energy.

With regard to the above discussion, it is clear that the Gauteng Department of Education implement environmental projects in schools. Government officials who implement environmental projects are aware that they need one another. The minutes of the meeting on EnerKey long-term prospective group held in Johannesburg on 18 September 2008 and by government officials from various departments on 1 March 2011 show that effort is made to form a joint team (Minutes on EnerKey, 2008, City of Tshwane, 2011:n.p.). In terms of these minutes four departments were represented, namely the, the Gauteng DoE, the Department of Local Government, Housing and the GDARD and the City of Tshwane local government. The researcher was paired with officials from other departments to collaborate on environmental projects/programmes' competitions and prizes. However, the committees have never had effective collaboration and they often still operate in isolation.

Based on the above discussion, it is evident that the DoBE is central to the implementation of EE projects/programmes because every department is targeting schools.

Moila (2008:1) undertook a study in the Mogale City local municipality to describe the status quo of the sustainability of *BKB* environmental projects. The results revealed a lack of a variety of resources to sustain environmental projects and programmes in the wards and the need for continued support from provincial department and local municipality in order to sustain the *BKB* environmental projects and programmes. On the other hand, in his evaluation of the beautification of schools as an environmental management tool, Lebeloane's (2004:1) findings reveal that "some schools do have environmental policies". However, Lebeloane (2004:1) adds that schools with environmental policies "lack environmental policy objectives, timeframes according to which environment programmes action need to be reviewed, and schools that used the environmental

management strategy have never taken proactive measures to better manage the environment of their schools”.

The two studies mentioned above highlight the fact that the implementation of environmental projects is still overshadowed by some impediments. It is further indicated by local government that it is important to communicate with the *BMW Group* of South Africa and the South African National Biodiversity Institute (SANBI) parastatal because they also work with schools on environmental projects. The *EnerKey* project is an example of such projects that require the involvement of the district, head office, school, and the school governing body. It has proved to be difficult for this joint team because the officials do not plan activities together for the quarter or per annum. It is important therefore for every person or official who is involved with exchange programmes to understand the bureaucracy with regard to partnership. Collaboration of government departments is discussed below.

### **3.15 Collaboration with regard to Bontle ke Botho**

The municipality works with the GDoE to conduct the *BKB* project, which is implemented through competitions in schools. Schools are involved through establishing gardens, for example. Mention was made during the *BKB* campaign prize-giving that “it is important for Government to plan environmental actions with communities and schools” (Moatse, 2010:n.p.). During the *BKB* campaign prize-giving in 2011 at Mogale City some government departments were represented. These included the GDoE, Public Works and Infrastructure Development, Agriculture and Environmental Management, as well as the City of Tshwane and Johannesburg municipalities.

#### **3.15.1 An overview of the Bontle ke Botho campaign**

The campaign was initiated in 2002 after the World Summit on Sustainable Development. The *BKB* is an EE campaign and a strategy that the Gauteng province employs in response to the requirements of the World Summit on Sustainable Development, as the best possible way to implement Agenda 21, which is a blueprint for sustainable

development (GDARD, 2011/2012). Mention was made earlier that the campaign targets schools and partnerships to ensure mutually benefits. The campaign comprises of three categories, namely the school, the wards and the metropolitan and local municipality.

### **3.15.2 Bontle ke Botho objectives**

The objectives of the campaign include the following.

- Participation: To mobilise communities and stakeholders from all relevant sectors to participate in the protection of the environment.
- Awareness: To create awareness and deepen the understanding of environmental issues and their implications for communities, positive and negative respectively, as a result of these issues being addressed or not being addressed.
- Sustainable living practices: To promote and foster sustainable living practices by encouraging communities to engage in sustainable environmental projects with a strong focus on poverty alleviation.
- Partnerships: To establish mutually beneficial strategic partnerships to ensure collaborative management of the campaign in wards and schools.

### **3.15.3 Overarching theme and sub-themes of Bontle ke Botho**

The overarching theme is sustainable living and poverty alleviation. It has a cluster of sub-themes, which each participant is required to work on, which include the following:

- Water conservation, which promotes water-wise activities,
- Litter and waste management, which promotes reducing, repairing, re-using and recycling waste materials,
- Energy efficiency and conservation, which promotes energy-efficient ethics and practices,
- Sustainable agriculture, which promotes environmentally friendly agricultural practices and
- Greening, which promote all forms of greening.

### **3.15.4 Provincial government and its role in Bontle ke Botho**

In accordance with the South African Constitution, each of the nine provinces has its own legislature that is made up of between 30 and 80 members (South African Government Local, 2012). The Gauteng Department of Agriculture and Rural Department coordinates *BKB* at provincial level in collaboration with the Gauteng DoE, the Gauteng Department of Local Government and the Gauteng Department of Health (City of Tshwane, (2010a:2). Following South Africa becoming a democracy in 1994, the democratic Constitution in Chapter 2, the Bill of Rights, enshrines the right of every citizen to a clean and healthy environment. According to Wanyama (1999:336), “some of the EE programmes like *Bontle ke Botho* are initiated by the provincial government”. The programme is jointly implemented by the DEAT (currently the DEA) and the Department of Agriculture and environmental management in collaboration with the GDoE. It is worth noting that in Pretoria the programme is currently implemented by local government (City of Tshwane) in partnership with the DEA, the GDARD and the GDoE. The role of the provincial government is to develop the whole plan of the *BKB* campaign.

### **3.16 Partnerships**

A partnership is defined as an “arrangement where parties agree to cooperate to advance their mutual interest” (Partnerships, n.d.). In addition, partnerships “may be non-profit, religiously and politically to increase the likelihood of each achieving their mission and to amplify their reach” (Partnerships, n.d.). In this study partnerships refers to a situation whereby people from different organisations, countries and government departments work together in order to achieve a common goal or solve a common problem, as indicated under the definition of concepts in Chapter 1. Partnerships are a way of ensuring collaboration of governments, which also require coordination. The value of partnerships is discussed in the next section.

### **3.16.1 The value of partnerships**

Partnerships can take between individuals, businesses, NGOs, schools and governments. Barnes and Phillips (2000:2) concur with Odeke (2012:n.p.) that “partnerships can contribute significantly to the process of sustainable management within higher education institutions and external organisations by promoting the effective use of human resources, information, and finances for environmentally beneficial activity”. Other advantages of a partnership (Partnerships, n.d.:n.p.) are that they are in general inexpensive and easily formed; resources can be pooled to obtain capital; complementary skills are provided, whereby the partners can reap the benefit of being able to utilise the strengths, resources and expertise of each other; partnership incentives for employees often attract highly motivated and qualified employees, and partnerships with government can ensure tax benefits.

Although partnerships may have some disadvantages, this study chose to consider the advantages, because partnerships regarding EE are not based on win or lose.

### **3.16.2 Partnerships at international level**

One form of partnership with the GDoE from other countries takes place through international exchange programmes (GDoE, 2008:3, 14–15). This type of programme involves exchange of learners, educators or officials of the Gauteng DoE to any country outside the RSA and vice versa. The purpose is to enhance best practices for education locally and internationally (GDoE, 2008:3). Before a partnership programme can commence, a partnership agreement should be signed. The partnership is actually built around desired objectives and outcomes (GDoE, 2008:3).

DEA (2011:1) has this to say about partnerships: “The Global Environment Facility Fund, as a key partner on the initiative, unites 182 member governments in partnership with international institutions, NGOs, and the private sector to address global environmental issues.” The COP17 Green Passport is one of the many green awareness-raising initiatives in place. The passport acknowledges the importance of partnership even at international level to address global environmental issues.

The Global Citizens Network is an initiative by the USA to encourage international networking between teachers of the USA and other countries to work together on significant educational issues. Blick is an educational consultant and an elementary school teacher from the USA who lived in South Africa for a year (in 2012) to launch an international partnership between a primary school class in Cape Town and one in New York (Blick, 2012:9). Learners exchanged environmental messages through technology, for example text, photos, videos and Skype. Environmental messages covered topics such as conservation, sustainable development and climate change (Blick, 2012:9).

Stein (2012:n.p.) is of the opinion that “although networks in international partnerships are not working in general they can if well managed”. The author states that we have to be innovative”. Some basic factors for successful networking are relevance and sense of urgency, benefits and incentives, roles and responsibilities, organisational structure and rules, learning and reflection, capabilities and skills, resources and external support (Stein 2012:n.p.).

The above-mentioned should be given attention to ensure successful EE actions. Networking should have some benefits and incentives and there should be clear roles and responsibility in a structure that is governed by rules. The network should give itself time to learn and reflect on what works and does not. Those with capabilities to lead and with skills should be granted the opportunity to lead and facilitate the process. The availability of resources such as funds should be considered as well as seeking support from outside. Government should have a coordinating team that has skills and is capable in as far as EE is concerned to have effective EE actions.

It is again evident that actions are being taken at international level to address environmental issues. Schools are crucial in the implementation of environmental projects, as it is indicated earlier in this chapter that Agenda 21 regards both formal and non-formal education as indispensable to changing people’s minds.

According to Agenda 21, governments should in their attempt to address environmental problems take actions even outside schools environments. The governments’ effort in addressing environmental problems includes tax charges, for example, when people buy

cars. The Toyota Motor Europe-Corporate Social Responsibility relates to government's once-off tax charged buyers. Buyers have to pay the tax because the car emits gas that pollutes the environment. Discussions on climate change by countries of the world took place in Durban in December 2011, hosted by South Africa as COP17. Govender and Naidoo (2011:13) report that "South Africa currently produces more than 90% of its electricity from coal-fired power stations while it accounts for over 1% of man-made greenhouse gases in the world". The inclusion of local government in this study is to examine their effectiveness in EE action as part of government, and because they are part in decision making. The outcomes of COP17 held in December 2011 in Durban left more to be desired because not all countries agreed or signed to commit themselves to reduce emission.

### **3.16.3 South Africa and Germany Department of Education partnership**

The EnerKey project is one of 10 German-funded projects taking place in megacities (a city that has more than ten million inhabitants) in developing countries across the world, and Johannesburg is one such a city (Foss, 2011:17). The GDoE is also involved in partnerships at international level to address environmental problem, done through a project that deals with energy efficiency. A good example is that mentioned earlier of learners from Pace College in Johannesburg, who will use Skype to communicate with learners from the Uhlandschule German school in Stuttgart to compare how much electricity their schools use (Foss, 2011:17). In *The Star* (Foss, 2011:17) Professor Harold Annegarn, the principal investigator of *EnerKey* at the University of Johannesburg's Sustainable Energy Technology and Research Centre, says "the pupils will Skype about once every two weeks using voice and video to compare their energy performance". The professor adds that "the aim of the programme is to bring energy issues into the school curricula and to raise awareness in the children's broader communities". Learners in Germany and South Africa will compare their energy usage by switching off lights and all electric appliances every day after school activities and compare the results, as mentioned earlier.

The project is environmental in the sense that it teaches learners to save energy, which in turn will reduce the energy demand and ultimately reduce air pollution. According to the

principal investigator of *EnerKey*, awareness needs to be raised among the general public, but more particularly among school children, “because if children do not understand energy usage and how it relates to their health and the health of their environment we are not going to win in the future” (Foss, 2011:17). The principal investigator acknowledges that the programme requires close collaboration with the provincial government of Gauteng “to create scenarios for Gauteng’s future energy landscape” (Foss, 2011:17). Professor Harold Annegarn commented:

What sort of city do we want to be in the future? Instead of [academics] creating new knowledge and publishing it in obscure journals, this programme requires us to find out how the Government works, and to work with them to implement our knowledge.

This implies that collaboration is crucial to ensure effective EE actions by government departments and partnerships, and has extended even to international level. Environmental problems should be addressed by all.

According to the minutes on *EnerKey* meeting (2008:8) the *EnerKey* long-term prospective workshop group brainstormed on problems and challenges which Gauteng will be facing in the future with regard to energy-related issues. Identified challenges include among others the need for central and integrated planning whereby government take leadership in directing energy systems towards sustainability; current economic plans focusing strongly on energy (carbon-intensive industries), which might cause problems in future; and the need for intensified capacity building. This suggests that the workshop could identify future problems when discussing problems and challenges Gauteng might be facing in the future on energy-related issues which suggests that Gauteng will have to be proactive and address energy-related issues. It is therefore important at this stage to evaluate the effectiveness of EE initiatives.

Odeke (2012:9) concurs with Stein (2012:n.p.) on networking in partnerships. The author states that “the United Nations Environment Programme (UNEP)’s Environmental Education and Training Unit (EETU) works with and through universities to enhance

Environmental and Sustainability Education with a focus on three key issues namely, education, training and networking” (Odeke, 2012:9). The EETU’s flagship initiative is the Global Universities Partnerships on Environment and Sustainability, and the aim is to “demonstrate the potential and value of global networking in environmental and sustainability education using the current achievements, outcome/outputs and impact as benchmarks” (Odeke, 2012:9). Networking in partnerships is viewed by the two authors as an effective strategy to address environmental problems.

### **3.17 Partnerships at national level: Procedures**

According to the GDoE (2008:15), there are four kinds of partnership agreements. These are:

- Agreements entered into and by the national government wherein the terms of reference for education’s involvement will be defined.
- Agreements entered into and by the national GDoE wherein the terms of reference for education’s involvement will be defined.
- Agreements entered into and by the provincial government wherein the terms of reference for education’s involvement will be defined.
- Agreements entered into and by the provincial GDoE wherein the terms of reference for education’s involvement will be defined.

An example of a partnership is between the City of Tshwane and companies such as the BMW Group of South Africa and SANBI. The Gauteng DoE will approve a partnership that involves a school, cluster of schools or a district. If the partnership involves a school, the initial recommendations will be made by the principal and the school governing body. The final approval will be sought from the district director in consultation with the policy and planning unit within the organisation to address environmental issues (GDoE, 2008:9). All potential partnerships have to be assessed for feasibility, and links to the strategic plan of the Gauteng DoE while head office partnership unit offer support to schools and districts if there is a need. Further indications are that the policy and planning unit will be responsible for guidance and registration of projects at inter-district level and for various directorates at head office. The final decision relating to any project is the

responsibility of the chief executive officer of the Gauteng DoE, who is the chief accounting officer. The chief accounting officer is responsible for all resources accrued to the Gauteng DoE as a result of partnership programmes. Partnerships with NGOs are important and are discussed below.

Partnerships are entered into for the purpose of ensuring participation of all sectors such as the government and NGOs to address environmental issues. Partnerships within government departments and with NGOs and companies at international level are important, because all people should be engaged in addressing environmental issues. The approach towards addressing environmental issues should be a collective one. Governments departments should strive to prepare strategies aimed at integrating environmental and development issues into education at all levels, done in cooperation with all segments of the society. Masondo (2002:4) advocates that “both the government and NGOs should join hands to ensure effective implementation with regard to environmental actions in the achievement of targets set during the summit”.

Furthermore, this idea is in agreement with the general agreement reached at international level at the Tbilisi, Stockholm and Moscow conferences, as set out in the Brundtland report and at both the Earth Summit and the World Summits on Sustainable Development as well as Agenda 21, that EE should be implemented in work environments and in education at both formal and non-formal levels (Sitarz, 1994:93). It is therefore of utmost importance for governments to enter into partnerships to ensure participation by all people in the environmental endeavour.

### **3.18 Partnerships with non-governmental organisations**

According to O’Donoghue and Oliver (2008:25), “NGOs and government agencies join with communities in practical environmental projects that include wetlands rehabilitation, dongas reclamation or tree planting”. Partnerships are viewed as a way of addressing environmental concerns from local to international level through various activities, as mentioned above. In Chapter 1 it was stated that both formal and non-formal education are key to addressing environmental issues. EE centres play an important role in providing EE actions as partners of the GDoE.

Other EE centres with which the GDoE has partnered are the Delta Environmental Centre and the Walter Sisulu Environmental Centre (the two centres also provide EE training for teachers). Teachers are trained while learners are taught about issues of the environment such as waste management, recycling, climate change and global warming. The Delta Environmental Centre in Johannesburg together with the Walter Sisulu Environmental Centre in Mamelodi trained teachers from Tshwane South district during the school holidays in March 2011. The centres have a proven track-record with regard to providing services ranging from curriculum-related courses for schools to courses for the public, business and industry (Loubser, 2010:160). The issue of training surfaced in Chapter 36 of Agenda 21 and is supported by Simalumba (2011:25), who mentions that “environmental education training should be done in all sectors of society”. There are other places that offer environmental lessons, which include the Walter Sisulu Botanical Gardens and the National Zoological Gardens (Walter Sisulu Botanical Garden, 2014).

Topics covered include recycling and waste management and exploring the concept of sustainable development (Delta Environmental Centre, 2011). Facilitators from the Gauteng DoE arranged an excursion for teachers in Tshwane South District to the Mogale’s Gate Environmental Education Centre to celebrate heritage month in September 2011 (Mogale’s Gate Environmental Education Centre). The Mogale’s Gate Environmental Education Centre partners with the Maropeng World Heritage Site and offers environmental lessons that include the following:

- Medicinal plants that are also planted in their nursery covered in grade 6 Social Sciences in the NCS.
  - Climate change, covered in grade 7 Social Sciences content in the NCS curriculum.
- The centres offer activities that address the environment topics in the National Curriculum and Assessment Policy Statement.
- Water in South Africa, covered in grade 4 Social Sciences CAPS curriculum.
  - Natural resources and conservation in South Africa covered in grade 7 Social Sciences content in the CAPS curriculum.
  - Processes to purify water resources, covered in grade 6 Natural Sciences content in the CAPS curriculum.

- Energy and transfer covered in grade 4 Natural Sciences in the CAPS curriculum.

The groups that visited the centre during the month of September were given a tree to plant in an attempt to address climate change. This conception concurs with that of the SABC Green Tips (2011:5) that states “If every person did something small every day, we could save the biggest thing we share, The planet, plant a tree. An average size tree produces enough oxygen in one year to keep a family of four,” while the South African government celebrates National Arbour Week every year in September, when trees are planted. The quotation by the SABC is making people aware that any action we may take to plant a tree is important and that tree gives us oxygen.

### **3.19 Summary**

Chapter 3 provides information on the Constitution of the Republic of South Africa and legislation that relates to addressing environmental issues in the country. Government departments and their EE initiatives at national level were discussed. These departments and initiatives include the DWA (*Baswa le Meetse Award, Aqua Enduro*, alien plants), the DEA (career booklets, wetlands charts), the GDoE (*Eco-Schools, EnerKey* and collaboration with the City of Tshwane on *BKB*), and the City of Tshwane municipality (*water sanitation, BKB, energy efficiency*). Partnerships between government departments and NGOs, environmental centres and parastatal such as SANBI and collaboration of government departments in South Africa were also discussed. The research approach, method, design and process of this study are discussed in the next chapter.

## CHAPTER 4

### RESEARCH APPROACH, METHOD AND DESIGN AND DATA COLLECTION TOOLS

#### 4.1 Introduction

The theoretical foundation for the effective implementation of EE actions by government departments was highlighted in chapters 2 and 3 in a literature review. Chapter 4 presents the research approach, method and design and data-collection tools employed during the study, as well as aspects such as the reliability and validity of the study. Researchers usually employ one of three approaches, namely qualitative, quantitative or mixed-methods research approaches. A qualitative approach was used for this study by employing a case study method. Researchers in qualitative research focus on individuals' social actions, beliefs, thoughts and perceptions. This study utilised qualitative research strategies to collect data, which included interviews, observations and document analysis. This chapter also addresses how the data were gathered to reach the objectives of the research and to determine the perceptions of the participants regarding the implementation of EE by the selected government departments as well as the meanings they attach to such actions.

#### 4.2 Research approach

Qualitative researchers employ a qualitative approach when explaining their data, while quantitative researchers use statistical methods especially during data analysis (Babbie, 2007:286). Qualitative researchers always choose a set number of interviewees and sometimes quantify their results. According to Rubi & Babbie (2013:47), researchers may employ both qualitative and quantitative approaches, while Babbie (2010:25) states that "a complete understanding of a topic often requires both techniques". Therefore, these approaches complement each other. However, this study only employed a qualitative approach, as it adequately emphasised the depth of understanding, attempt to

subjectively tap the deeper meanings of human experience, and are intended to generate theoretically rich observation (Rubin & Babbie, 2007:34).

Qualitative research refers to the type of enquiry in which the qualities, characteristics or properties of a phenomenon are examined for a better understanding and explanation (Rubin & Babbie, 2013:63). Marshall and Rossman (2011:69; 92 & 93) advocate that “qualitative research offers opportunities for conducting exploratory explanatory, and descriptive research, that uses the context and setting for a deeper understanding of the person(s) being studied”. Furthermore, Rubin & Babbie, (2013:63) concurs with Marshall and Rossman (2011:69; 92 & 93) that qualitative research seeks a deeper understanding of the subject in question.

Rubin & Babbie (2007:34) mentions that a qualitative approach is “chosen in situations where a detailed understanding of a process or experience is wanted, more information is needed to determine the exact nature of the issue being investigated, or where the only information available is in non-numeric form”. Rubin & Babbie (2007:34) agrees with Rubin & Babbie (2007:23) that a qualitative approach seeks an informed understanding without making use of statistics. This study employed qualitative research based on the reasons provided by Rubin and Babbie (2013:62 & 63); Marshall and Rossman (2011:209 & 139), namely that it is descriptive; it involves fieldwork; it is concerned primarily with processes rather than outcomes; it is inductive, as the researcher builds abstractions, concepts and theory from details; the researcher is the primary instrument for data collection and analysis; and it is fundamentally interested in meaning, in other words how people make sense of their lives, experiences and their structure of the world and environmental issues.

Qualitative methodologies acknowledge that all research in the social sciences disciplines and applied fields might well be subjective shifting the discourse to a discussion of epistemology and to strategies for ensuring trustworthy and credible studies (Marshall & Rossman, 2011:5). This methodology is associated with interpretivism which like constructivism values subjectivity as interpretive researchers attempts to develop an in-depth subjective understanding of people’s lives. Constructivism was employed in this study because all knowledge is a human construct (Denzin & Lincoln, 2013:255 & 257).

This study set out to find an explanation concerning the ‘why’ questions of the study, as recommended by Babbie (2007:90). Qualitative studies aim for depth rather than breadth with regard to understanding a phenomenon. This study sought to investigate the effectiveness of governmental EE programmes.

### **4.3 Situating constructivism in the study**

Constructivism advocates that all knowledge is human constructs, how people methodically construct their experiences, worlds, and the contextual configurations of meaning and institutional that inform and shape reality-constituting activity as pointed earlier by (Holstein & Gubrium, 2013:255). Furthermore, a constructivist study how, what and sometimes why (Charmaz, 2006:131); Holstein & Gubrium, 2013:255).

This study employed a qualitative approach in which knowledge claims are constructivist in nature and ethnomethodological paradigms because they are unique approaches to qualitative research (Babbie, 2010:306). The period of the 1990s’ constructivist philosophies started playing a considerable role in shaping EE methodologies (De Lange, 2004:93). The author states that one current trend is to make classroom learning relevant to learners through fieldwork where they will use what they know in the classroom and their own experiences to make sense of what they see in the field. According to De Lange (2004:93), the different interpretations of constructivism influenced educational theory in the whole world and also became a dominant orientation towards the development of C2005. According to Charmaz (2006:130) a constructivist approach means more than looking at how individuals view their situations but also theorises the interpretive work that research participants do and acknowledges that the resulting theory is an interpretation.

Government departments and the City of Tshwane municipality have implemented various EE programmes such as community gardens in Mamelodi and Soshanguve. The DWA implemented the 2020 VFWSEP, which include competitions/initiatives such as the *Baswa le Meetse Award*, the *South African Youth Water Prize*, *Aqua Enduro*, *Working for Water* and curriculum support and intervention (DWA, n.d.(a):9–10). The

BMW Group of South Africa's *seed programme* focuses on greening, which is done by starting and maintaining gardens in conjunction with the DoE, particularly schools.

The researcher's aim was to evaluate the EE projects/programmes managed by government departments, namely the GDoE, DWA and DEA, and the City of Tshwane municipality, and why these projects were executed in a specific way. It is in this type of study where the 'variables' are usually not controlled, "because it is exactly this freedom and natural development of action and representation" that the researcher wants to capture (Henning, 2005:3). A variable refers to a component of the phenomenon that is studied (Rubin & Babbie, 2013:84). This study had four variables, namely selected government departments (the GDoE, DWA and DEA and one local municipality, the City of Tshwane municipality) as the phenomenon that was studied, while focusing on individuals' social actions, beliefs, thoughts and perceptions relating to the selected government departments. The individuals referred to are the GDoE employees, particularly the subject advisors, policy and planning officials and teachers, the DWA and the DEA and City of Tshwane municipality EE implementers.

The researcher used evidence from the literature and collected data to understand and explain the effectiveness of EE actions by selected government departments. Furthermore, the researcher did not want to place this understanding within the boundaries of an instrument that was designed beforehand, as this would limit the data to those very boundaries. Therefore, in this way, understanding was also dependent on these boundaries. According to McMillan and Schumacher (2001:16), qualitative research develops context-bound generalisations because the qualitative researcher is convinced that human actions are strongly influenced by the environment in which they occur.

Rubin & Babbie (2013:248 & 250) indicates that in a qualitative approach, knowledge claims are constructivist assumptions in nature that use ethnographic design as a strategy of enquiry and observation, interviewing and case studies as methods. The nature of knowledge for this study was constructivist, and case studies were used to determine the effectiveness of EE action by government, using observations, document analysis and open-ended interviewing as strategies. Mason (2002:52) points out that most qualitative researchers at some stage use some form of qualitative interviewing, which many researchers use as their main method of collecting data. Qualitative interviewing can

involve techniques such as observations, generating and using documents and generating and using visual data. The researcher used semi-structured interviews because she chose qualitative research that employed face-to-face type of interviews. Mention was made in Chapter 1 (Section 1.12) that multiple strategies of collecting data were employed in this study.

#### **4.4 Research method: Case studies**

The aim of a case study was an in-depth study of EE actions to produce explanatory information. The purpose of conducting a case study might be to understand why and how it implemented that decision, what unanticipated problems occurred in the aftermath of the closing (Rubin & Babbie, 2007:239). According to Charmaz (2013:297), qualitative studies are also context-bound. Rubin and Babbie (2013:63) indicate that qualitative research develops context-bound generalisations because the qualitative researcher is convinced that human actions are strongly influenced by the environment in which they occur. Rubin and Babbie (2007:244) advocate that “qualitative researchers detect patterns in their inductive observations, form new concepts and generate theories that are grounded in data”.

Purposive sampling is a feature of qualitative research in which researchers select the cases to be included in the sample according to their judged possession of the unique characteristics sought for (Cohen *et al.*, 2007:114–115). The three government departments, namely the GDoE, the DWA and the DEA, and one municipality, namely the City of Tshwane municipality, were selected purposively because of their knowledge of and involvement in EE actions. The three departments and a municipality form a single case study to develop context-bound generalisations in terms of the effective implementation of EE initiatives in South Africa because Babbie (2010:309) states that a case study focuses attention on a single instance of a social phenomenon.

The fact that a case study is defined as a unit of study and a bounded system permits the possibility that any number of qualitative strategies can be combined with the case study method, with ethnography as the most common one. The researcher incorporated grounded theory with a case study method, as ethnographic case studies focus on the socio-cultural interpretation of a particular cultural group (Rubin & Babbie, 2013:250).

The selection of the case, in this study: government was done purposefully by the researcher for practical reasons, particularly regarding time and feasibility, as recommended by Mouton (2008:100).

This research project was a case study that was restricted within the boundaries of government. This investigation considered cases of government departments at both international and national levels because the aim of this study was both descriptive and exploratory (Mouton, 2008:94). Case studies pay attention to one or a few samples of some social phenomenon (Babbie, 2007:298); in this case, the three government departments and one municipality were selected, which formed part of a large pool of governmental institutions.

A case study method involves systematically gathering enough information about a particular person, social setting, group or site to allow the researcher to understand effectively how it operates or functions (Babbie, 2010:309) in this case, how government EE actions function. According to Rubin and Babbie (2013:250), a case study design focuses on one phenomenon, which is to be understood in depth, despite the number of persons or sites in the study. The researcher employed a case study research method to gather systematic and thorough information, and to use it as a vehicle for in-depth description and analysis in this research. A further reason for choosing this method was to examine the process of policy implementation in terms of the EE policies in South Africa, focusing on government, in particular its departments as its agencies. The researcher deemed it necessary to use a case study method because it provides a good opportunity for the investigation and analysis of a unit or phenomenon (Rubin & Babbie, 2007:239).

It has been highlighted in Chapter 1 (Section 1.1) that the environment has become one of the major issues of our time because the state of the environment is deteriorating. The focus in this study was on the description and investigation of whether government implements EE actions effectively, because the case study method searches for meaning and understanding (Rubin and Babbie, 2013:250).

## **4.5 Ensuring research accuracy**

The key concerns of research in general include validity, reliability, ethical issues and honesty (Elton-Chacraft *et al.*, 2008:80; Hennink, 2007:33). Validity and reliability will first be defined and then situated in this investigation.

### **4.5.1 Validity**

Validity refers to the success of a method of measurement in measuring exactly what it claims to measure (Elton-Chacraft *et al.*, 2008:80). It is a means of getting results that accurately reflect the concept being measured (Babbie, 2010:158). It is the degree to which an explanation of a phenomenon matches the reality and interpretations of the participants and the researcher (Rubin & Babbie, 2013:182). The definitions above concur that validity is a yard stick to ensure quality information.

### **4.5.2 Reliability in data-collection**

Reliability refers to the extent “to which repeated measurements under the same conditions produce the same results (Elton-Chalcraft *et al.*, 2008:27). It is viewed as a subset of validity (Elton-Chalcraft *et al.*, 2008:72) and concerns consistency (Babbie, 2010:158).

The two concepts (validity and reliability) are essential for this research because data should be reliable and valid to provide good research results. In an attempt to ensure validity and reliability, the researcher:

- guarded against deception throughout the study by asking practical questions and probing during observations and interviews,
- was involved during every stage of the study, particularly the data-collection stage, which involved close interaction with the subjects,
- piloted the interview questions,
- sequenced the questions well,
- avoided fictitious constructs,

- used language that was not vague or ambiguous,
- took notes and kept records of dates on which the fieldwork was conducted that could be revisited at a later stage to ensure accuracy of data,
- conducted the interviews and observations at government departments and schools (natural settings) to reflect the reality of life experiences,
- considered relevant ethical issues; and
- employed triangulation.

Triangulation (or multiple methods of data generation) refers to the use of more than one technique in order to check the interpretation of one against the other (Elton-Chalcraft *et al.*, 2008:79; Smith, 2008:63). The researcher employed triangulation as it is one way of addressing issues of validity because all data-collection techniques have both strengths and weaknesses. It therefore assisted with facilitating specific strengths while minimising weaknesses.

#### **4.6 Research design**

Babbie (2007:305) states that a research design in qualitative interviewing is interactive in the sense that the researcher repeat the processes of gathering information, analysing it, winnowing it until she is closer to a clear and convincing model of the phenomenon that is being studied. A research design outlines how the process of the study will unfold by showing where it will start and will be going (Denzin & Lincoln, 2013:45).

According to Denzin & Lincoln (2013:45) “positivist, postpositivist, constructionist, and critical paradigm dictate, with varying degrees of freedom, the design of a qualitative investigation”. Figure 4.1 provides a framework of how an investigation can be conducted, even though the design may not be rigid. The research design occurs at the beginning of a research project and involves all the steps of the subsequent processes. The researcher’s planning in this study is the first part of her task as the manager of an inquiry (Henning, 2005:142) by ensuring that things are done effectively and efficiently, that the work is of good quality, as well as that the research sites are available and that potential participants are willing to engage (Henning, 2005:143). It is further highlighted by Denzin & Lincoln (2013:45) that the researcher first thinks about research, reflects and

plans or designs a study to acquire competence in the methods and techniques associated with qualitative inquiry. Although in qualitative research the design elements are worked out during the course of the study (Babbie, 2010:113 & 114), the research planning framework to guide this study is outlined below.

Preparatory aspects >	Methodology >	Case study/instrumentation >	Piloting
- purposes	- approaches	- reliability	
-purpose	-reliability	-validity	
-ethics	-validity	-pre-piloting activities	
-research questions			

**Figure 4.1: Research planning framework (Cohen *et al.*, 2007:78)**

To ensure validity and reliability of the interview instruments, pre-piloting activities were conducted, as recommended by Mouton (2008:103). For this study, pre-piloting activities focused on the GDoE, because all other departments implemented their EE actions in collaboration with the GDoE.

This study considered design flexibility as this is crucial for qualitative research. It differs from experimental research that is carefully planned prior to commencement of data collection, with no possibility of change once started. Qualitative research is open to change throughout the process of data collection (Babbie, 2010:318). According to Babbie (2010:318), “[t]his permits the researcher to adjust the direction of the inquiry based on the ongoing experience of collecting and thinking about the data”.

An enquiry might begin with a specific idea about the way things are (Babbie, 2010:121). This study began with a specific idea about the way things are in terms of the effectiveness of EE actions implemented by government, and this led to the development of a research design for this study. The researcher formed the impression that effective implementation of EE actions by government departments requires proper coordination and training of officials. This means coordinated teams comprising of officials from various government departments, trained in EE serving at national, provincial and district levels to ensure the effectiveness of EE actions. All officials from government

departments dealing with EE actions should be trained in EE to ensure the effectiveness of EE projects. Facilitators from the GDoE should provide effective monitoring and support at schools to ensure the effectiveness of EE actions.

According to Marshall and Rossman (2011:7) a research design refers to the plan and structure of the investigation used to obtain evidence to answer research questions. It further indicates that the design describes the procedures for conducting the study, including when, from whom and under which circumstances the data will be collected (Denzin & Lincoln, 2013:45). Makokotlela (2009:54) states that the research design is a framework that guides the researcher on how to collect, analyse and interpret the collected data. This research employed a qualitative approach, as it attempted to answer the basic questions such as how data would be collected and how the collected data would be analysed and interpreted. The purpose of the research design was to produce results of good quality.

#### **4.7 Data collection tools**

After the researcher had identified the purpose of the study, attention was given to some preliminary checks, which included data-collection techniques and the structure of the questions that were to be used (Smith, 2008:63). Data for this study were collected through three fundamental techniques, namely observations, semi-structured interviews (in-person interviews) and document analysis. The open-ended, one-to-one interviews and observations were employed because they can provide first-hand information. Interviews can generate in-depth data, because where there is a trusting relationship between the interviewer and the interviewee it can allow personal or sensitive issues to be explored (Elton-Chalcraft *et al.*, 2008:92–93).

##### **4.7.1 Observations**

Observation is central to qualitative research (Marshall and Rossma, 2011:139). Data for this study were collected through observations or ethnographies, as was indicated Section 1.13. The researcher used observations as well as interviews and documentary records for

this study (Hofstee, 2011:127). This is because observations are more objective than interviews and objects analysis (Smith, 2008:62). Henning (2005:98) has this to say about observations: “Observing the context of discourse text is thus a way of ‘reading the world’ of the participants in addition to ‘reading’ their spoken or printed texts, and the observation may explicate and also explain nuances of these texts”.

This means observations afford the researcher an opportunity to collect data that may be regarded as the pure experience of the researcher or original information because the researcher has ‘read’ the world of the study. The researcher can ‘read’ the context in question and obtain data that will supplement the spoken or written data. Mason and Dale (2011:19-20) indicates that it is vital to make full and accurate notes of what goes on during observations. This includes participant observation in natural field settings, as Mashall and Rossman (2011:139) explain, even though this is not a requirement (Hofstee, 2011:127). Shank and Brown (2007:64) state that the idea is simple: “you go and you pitch in when and where you need to understand what is going on” while Babbie, (2007:45) says observation involves “actual observation, looking at the world and making measurements of what is seen”.

The observer is active in the sense that he or she takes notes and sometimes asks questions for clarity in the context of discourse. Observations were employed for this study so that the researcher could gain personal experience in terms of the effectiveness of EE actions of selected government departments through direct observation. Comprehensive notes were taken during the observations, and the researcher probed the participants in their natural settings (Babbie, 2007:289). The researcher played the role of a participant and an observer with regard to the effectiveness of EE actions of government departments, as recommended by Babbie (2007:289), but where necessary, as this is not compulsory (Hofstee, 2011:127). The ontological perspective of the researcher is one that sees interactions and actions with the subjects as central, while the epistemological position suggests that knowledge or evidence of the social world can be generated by observing or participating in the real-life settings (Marshall & Rossman, 2011:139). Direct observations are considered because data are comprised of detailed descriptions of people’s activities and actions and the full range of interpersonal interactions and organisational processes that are part of observable human behavior (Marshall & Rossman, 2011:139).

An indication was given in Chapter 1 (Section 1.17) that this study observed the rules pertaining to ethics. Elton-Chalcraft *et al.* (2008:56) state that ethics is not necessarily the same as morals, but a notion of morality does inform our understanding of ethics. The authors explain that this understanding is influenced by cultural positions and current acceptance of what is good practice. According to Marshall and Rossman (2011:47), ethical research practice is grounded moral principles, ethics is associated with morality and is concerned with matters of right and wrong (Rubin & Babbie, 2007:37). This means ethics refers to agreeing on aspects that relate to either wrong or right. The following are some of the ethical issues that were considered in this study:

- The researcher requested permission from her institution and the ethical clearance certificate was submitted with the copy of the theses for examination (Rubin & Babbie, 2007:38).
- Permission was also requested from the selected government departments, namely the GDoE, DWA, DEA, and one municipality, namely the City of Tshwane municipality, to access government officials who were involved in EE projects because it is essential for a researcher to obtain such permission before engaging in this type of data collection (Rubin & Babbie, 2007:39). (See appendix A.)
- The researcher considered the issue of informed consent, as is the practice with observations (Elton-Chalcraft *et al.*, 2008:57; Hennink, 2007: 35).
- Participation in this study was voluntary (Rubin & Babbie, 2013: 60).
- The researcher explained the purpose of the study to the participants (Goodwin, 2007:44; Smith, 2008:63), which was to determine the effectiveness of EE by the South African government.

Observations were conducted at school level as EE initiatives by the South African government are mostly implemented in schools. An observation list was drawn up by the researcher to provide focus. (See appendix B). Aspects that were observed are indicated below:

- **Gardens:** both vegetable and medicinal gardens.
- **Recycling activities:** waste storage, type of waste (plastic waste, can and paper).

- **Water conservation:** leaking taps and leaking toilets, whether learners and teachers used their hands to drink water from the taps, how learners and teachers wash their hands using tap water, how they wash their lunch boxes using tap water.
- **Energy-efficiency strategies:** type of globes used, availability of solar water heaters.

Observation was conducted because it is more objective than interviews and document analysis (Smith, 2008:62). Observing the context discourse text is according to Marshall and Rossman (2011:139) a way of observing or participating in the real-life settings, added to reading their spoken (interviews) or printed texts (document analysis). The data collected during observations may be regarded as providing original information because the researcher had practically observed the context of discourse.

The researcher conducted the observations during school break time. This was because the researcher was not allowed to collect data during teaching and learning times. Furthermore, the observations were conducted during school support and monitoring sessions, as the researcher worked with the schools on a daily basis as a subject advisor. Class observations form part of her school visit activities and this afforded her the opportunity to observe the types of globes. Observations were carried out by using the list of sampled schools and the observation list that was compiled by the researcher.

#### **4.7.2 Interviews**

A qualitative interview is an interaction between the interviewer and the respondent in which the interviewer has a general plan of enquiry (Smith, 2008:63). As was indicated earlier, qualitative studies usually aim for in-depth rather than semi-structured and quantity of understanding (Babbie, 2007:305) . The participants' responses were probed and elaborated upon to achieve specific and accurate answers because qualitative in-depth interviews are characterised by probing procedures and not by their particular question format (Babbie, 2007:289).The researcher used interviews to gather information relating to the effectiveness of EE actions of selected government departments because it offered direct quotations from people relating to their experiences, opinions, feelings and knowledge (Babbie, 2010:318).

#### 4.7.2.1 Face-to-face interviews

According to Elton-Chalcraft *et al.* (2008:92), this type of interview provides good responses. Qualitative interviews might be structured with all the interviewees being asked the same questions (Hofstee, 2011:135) with questions ranging from open-ended to a few *yes* or *no* questions. Furthermore, this research used focus groups, where a small group of participants were asked in-depth questions about the topic in a semi-structured way, as well as one-to-one interviews (Hofstee, 2011:135) to generate data in this study.

The use of qualitative interviews as a data-generation method should be done in accordance with ethical requirements (Rubin & Babbie, 2013:60). According to Hennink (2007:33), all research should be conducted with respect to ethical principles and practices. Babbie (2007:62) states that ethics is typically associated with morality, which pertains to the concepts of ‘right’ or ‘wrong.’ Further indications are that individuals’ conceptions of right and wrong may be based on religion, political ideologies or the pragmatic observation of what seems to work and what does not. The following ethical criteria were considered by the researcher in order to elicit credible and dependable information:

- Consent was sought from the participants prior to audio-taping and taking notes of their responses (Hennink, 2007:35).
- The researcher ensured the participants of the absence of any risk of harm (Marshall & Rossman, 2011:47).
- The researcher guaranteed the confidentiality and anonymity of the interviewees by not identifying their names, but by assigning codes and keeping the information confidential (Rubin & Babbie, 2013:60; Hennink, 2007:33–38).
- Privacy was guaranteed to the participants in order to increase the truthful answers to the questions asked and to gain their trust (Marshall & Rossman, 2011:26; 47 & 62).
- The enquirer clarified the participants about the principle of justice (Marshall & Rossman, 2011:47).
- The researcher considered using appropriate and suitable methods for the participants (Elton-Chalcraft *et al.*, 2008:58).

- The enquirer identified herself and explained why she was conducting the research because deceiving people is unethical (Rubin & Babbie, 2013:61).

Open-ended questions were considered by this investigation. According to Hennink (2007:60), an open-ended question is one where no response categories are given, and participants can respond from many different perspectives. In turn, Babbie (2010:256; Rubin & Babie, 2013: 63 & 124) explains that open-ended questions allow the researcher to probe deeper into issues indicated by the participants, solliciting in a non-directive and unlocking an unbiased manner a more complete answer to a question. Accordingly, the researcher employed open-ended, one-to-one questions to elicit detailed information from the participants regarding the effectiveness of EE actions by government departments.

Interviews were conducted with the government officials or employees from the selected government departments and municipality. Participants from the GDoE included four subject advisors, ten teachers, ten heads of department and one policy and planning official. Two officials implementing EE programmes or projects were interviewed from the DWA, while two were also interviewed from the DEA. Two officials from the City of Tshwane municipality were interviewed.

Unlike with the school setup where teachers were interviewed during break time, there were no fixed times for interviews with officials from the GDoE, DWA, DEA and the City of Tshwane municipality. Appointments were made between the researcher and the officials to meet at times that were convenient for them. Officials from the GDoE, namely four subject advisors and one policy and planning official, were interviewed at the district, while the nine teachers and nine heads of department were interviewed at their respective schools. One official from the DWA was interviewed at the office while the other was interviewed at the Unisa campus. One official from the DEA was also interviewed during break at a meeting, as he did not have more time and the other in office, and one City of Tshwane municipality official was interviewed in office while the other was interviewed during break at a meeting.

The officials from the GDoE were interviewed because they are required by CAPS to implement environmental content and the principles of environmental justice as defined

in the Constitution of the Republic of South Africa (GDoE, 2011:5). This is implemented by the subject advisors (through monitoring and support) and teachers (through teaching) in the classroom. Officials from the DWA implement EE programmes such as *Baswa le Meetse* and *Aqua Enduro*, while the DEA provides career services such as internship focusing on the environment and the City of Tshwane municipality implements an EE programme, *BKB*.

#### **4.7.2.2 Sampling**

Sampling is a special subset of a population that is observed for purposes of making inferences about the nature of the total population itself (Rubin & Babbie, 2013:175). According to Mason and Dale (2011:234) sampling is an example of the issue of generalisation. Sampling is therefore the process of selecting a portion from the bigger pool of the population and then generalising the whole population. Generalisations are statements made on the basis of evidence that is local but that can be applied beyond the local context in which evidence for those statements has been assembled. The disadvantage of sampling is that a few people are selected to represent a bigger population, and therefore posing the possibility of omitting people who could have provided a wealth of information for the study in question.

##### **a Population**

A population comprises all the groups involved in activities related to what is being studied (Wanyama, 2009:69). The population in this study consisted of subject advisors, teachers/heads of department, DWA officials, DEA officials and the City of Tshwane municipality officials.

##### **b Sampling method**

This study used purposive sampling because it is a feature of qualitative research in which researchers select the cases to be included in the sample due to their judgement of their possession of the unique characteristics sought for (Cohen *et al.*, 2007:114–115). According to Rubin and Babbie (2013:175) purposive sampling involve the process of

selecting a sample based on the researcher's judgement about which units are most representative or useful. Shank and Brown (2007:127) explains that in qualitative research purposive samples are quite common and are often the desired mode of sampling. The researcher purposively selected the participants to allow the people most suitable for the study to be selected at the time that they are needed (Rubin & Babbie, 2013:175). In this study the most suitable participants were government employees from the GDoE, DWA and DEA and the City of Tshwane municipality officials to provide rich data, as they implement EE programmes and projects. Purposive sampling was employed because is vital for practical reasons, as part of the process of delineating the inquiry is setting the delimitation of the post clearly (Rubin & Babbie, 2013:175).

### **c Sample criteria**

The sampling criteria targeted the information-rich participants, particularly those who are at the forefront regarding the implementation of EE programmes and projects in schools. The researcher targeted subject advisors, teachers and heads of department because they implement environmental content as per CAPS. These participants provided adequate information for the study in question.

### **d Sample size**

The size of the sample depends on the complexity of the phenomenon that is investigated (Rubin & Babbie, 2013:165). The researcher for practical reasons selected two officials from the DWA and DEA and two officials from the City of Tshwane municipality. A larger population was selected from the GDoE because all other departments and the City of Tshwane municipality implement EE initiatives together with this department.

### **e Piloting of instruments**

Once the interview questions were reviewed and approved by the researcher's tutor and supervisor, the interview questions were piloted. The questions were pilot-tested through interviews with three officials from the GDoE and by obtaining three teachers' feedback on the questions before they were used in the study to check for bias in terms of the procedure, the interviewer and the questions themselves (Mason & Dale, 2011:65).

## **f Triangulation**

Triangulation is a means of seeking convergence or integration, a point at which data sources agree or differ in qualitative approach (Rubin & Babbie, 2007, 238; 2013:109-110). Qualitative researchers can use overlapping or multiple techniques for collecting data (Rubin & Babbie, 2007:238). Accordingly, multiple techniques for collecting data were employed in this study, namely observations, interviews and document analysis. The reason for triangulation is to enhance the validity of results by closing the gaps that might have occurred with one of the techniques of data collection.

### **4.7.2.3 Document analysis**

Charmaz (2006:35) states that all qualitative research involve analysing texts while Mason (2002:103) claims that the analysis of documentary sources is a major method of social research, and one which many qualitative researchers regard as meaningful and appropriate in the context of their research strategy. According to Marshall and Rossman (2011:60), documents are a valuable source of information and are collected as entities of data, after which the same route through analysis and interpretation is followed. Researchers may use old, new, printed, hand-written and electronic documents that address the research question if they may be of value (Marshall and Rossman, 2011:161). The author further mentions that there are many different types of documents, some of which existed prior to the act of research upon them, while others can be generated for or through the research process. Examples of the first type include minutes of meetings, books and acts of parliament, while examples of the second type include pictures, drawings and charts. The researcher used written documents as one of the sources of information. In terms of a person's ontological position, if this person is using visual or documents methods, this person will have an epistemological position that suggests that texts, documents, written records, visual documents, visual records and objects can provide or count as evidence of these ontological properties because Marshall and Rossman (2011:160) state that "both uses of documents are valuable".

Document information supplement data collected through interviews, while they provide the researcher with sufficient time to select more relevant information, as the researcher was able to analyse the documents that were collected from participants even at a later stage. The documents that were analysed included, among others, portfolios, books, guidelines, entry forms, flyers and the CAPS documents. Document analysis started during collection of documents at the sites because the researcher had to select data that were relevant to answer the study in question. The analysis continued after data collection, especially of documents where the researcher had managed to obtain extra copies and/or photocopies of them as well as instances where photographs were taken at sites such as gardens. Documents were analysed because they were regarded as a valuable source of information of social research and are collected as entities of data, after which the same route through analysis and interpretation is followed as pointed out earlier by (Marshall & Rossman, 2011:60)

The researcher visited the GDoE and the selected schools A to I and interviewed both the teachers and heads of department and also interacted with subject advisors at one district in which the researcher is stationed. Observations were made at school level, while documents were also analysed and some collected for further analysis. The DWA and DEA and the City of Tshwane municipality were also visited, where interviews were conducted and documents analysed and some collected for further analysis.

#### **4.7.2.4 Data analysis**

Data analysis is an ongoing process that begins during data collection and continues until the final report is completed (Hennink, 2007:206). Informal processing of data begins during the data-collection stage of the research, while the most formal part of data analysis involves an analysis of the transcripts of the participants. According to Babbie (2007:378), during the qualitative research data-collection process, analysis and theory are intimately intertwined. Marshall and Rossman (2011:207) indicates that in a qualitative approach, researchers use analytical tools such as general statements, patterns, themes or concepts to make generalisations.

Qualitative researchers analyse data inductively, moving from the particular to the general, from a set of specific observations to the discovery of a pattern that represents some degree of order among all the given events (Babbie, 2010:51). In this study the qualitative data were transcribed and coded using grounded theory as design, whereby the data were grouped on the basis of words, phrases and sentences that conveyed the same meaning. The individual participants' statements were categorised in terms of headings specifying opinions expressed and coded as per the research themes and emerging aspects. The three selected government departments and the one municipality formed the basis of the observations, interviews and document analysis. The following codes were used during data analysis.

<b>Variables</b>	<b>Codes</b>
Subject advisors	SA
Schools	S
Educators	E
Heads of department	HoD
Government departments: GDoE:	D1
DWA:	D2
DEA:	D3
CTLGM:	LG
Official Government department official	GDO

**Table 4.1: Codes for data analysis**

A total of 18 of the 20 intended participants, namely educators (E1 to E9) and heads of department (HoD1 to HoD9) as well as ten of the ten selected government department officials (GDO1 to GDO10) were interviewed. During this research, the process of data analysis entailed data transcription; coding of data (grouping the data into similar and dissimilar or arranging into categories and sub-categories); building themes; finding patterns; showing relationships, similarities and differences; and concluding and making recommendations.

#### **4.7.2.5 Interpretation of data**

Marshall and Rossman (2011:207-210) data interpretation means the combining of separate ideas in such a manner that it forms a complete whole. Interpretation involves the synthesis of one's data into larger coherent wholes; the researcher's interpretation with related concepts, themes, categories, general statements and the formulation of grounded theory.

#### **4.8 Summary**

The focus of this chapter was on an explanation of the qualitative research approach, research design and the case study method as the research method chosen for this study. In addition, explanations were given regarding the data-collection tools used in this research. Issues pertaining to the presentation, analysis and interpretation of the results obtained from the collected data are discussed in the following chapter.

## **CHAPTER 5**

### **PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA**

#### **5.1 Introduction**

The presentation, analysis and interpretation of data are presented in this chapter following the explanation of the research design in the previous chapter. The purpose of the data analysis that is presented in this chapter is to answer the research question that is stated in Chapter 1, namely “Are environmental education initiatives launched by the GDoE, DWA and DEA and the City of Tshwane local government effective?” This study selected a qualitative research approach, which was discussed in Chapter 4, while the rationale for selecting this approach was also explained in the same chapter. In addition, the researcher considered measures to ensure research accuracy. The research design and methodology were also dealt with in Chapter 4.

Three methods of data collection were employed by the researcher in an attempt to understand the effective implementation of EE initiatives by the government of South Africa. These included observations, interviews (See appendix B & C) and document analysis, as indicated in Section 4.7.2.3 of Chapter 4. Presentation, analysis and interpretation of data are dealt with in this chapter.

#### **5.2 Observations and site visits**

The researcher deemed it necessary to employ observations and site visits, because they were regarded as more objective than interviews and document analysis (Smith, 2008:62). Observations were carried out in nine sampled schools labelled S1 to S9. A checklist was drawn up to help the researcher during the observation process as well as the site visit (See Appendix B). It included a visit to and/or observations of gardens (vegetable and medicinal gardens), recycling activities, water conservation and energy-efficiency strategies. According to the City of Tshwane (n.d.(a)) schools, the City of Tshwane, the

BMW Group of South Africa and the DWA have jointly established some EE initiatives in schools.

### **5.2.1 Site visits and observations to determine the availability of gardens**

Site visits were carried out to establish the availability of vegetable and medicinal gardens in the nine out of ten schools that were sampled. The data revealed that seven out of the nine schools visited had a garden in which they planted vegetables, medicinal plants or both. Four schools only had a vegetable garden; one school had a medicinal garden, while two schools had both vegetable and medicinal gardens. However, two schools did not have any gardens. The above-mentioned gardens included gardens established by the City of Tshwane, the BMW Group of South Africa and the R3.00 and R5.00 budget plant nursery.

In terms of schools that had both vegetable and medicinal gardens, the one side of the school grounds was used for planting vegetables, while the other was used for medicinal plants. The medicinal plants form part of the decoration and are well cared for at these two schools, as shown in photos 5.1 and 5.2 below.



**Photo 5.1 Medicinal plants used as decorations**

The medicinal plants were also used by the teachers as teaching resources when they linked some of the topics in the curriculum to EE, especially in subjects such as Social Sciences and Natural Sciences, as reflected in Photo 5.2 below.



**Photo 5.2 Medicinal plants used as teaching resources for Natural Sciences**

As can be seen in photo 5.2. a teacher in S3 was busy teaching learners the history of medicine and the uses of some of the plants, for example *artemisia afra* (commonly known as “lengana”) that can be used to cure flu or cough, and *carpobrutus* (commonly known as “cheaps”) that can be used to heal wounds or cuts. This garden was established by the Pretoria National Botanical Garden. One of the interviewees from S3 indicated that both the teachers and learners had started using these medicinal plants. The learners were also taught that plants are important because they serve as habitat to animals while they provide oxygen. The need for conservation of plants was emphasised.

The vegetable gardens are mostly established to produce vegetables that supplement the GDoE feeding schemes. This is because most of the schools, especially the township schools in the Tshwane South district, have learners who come from poverty-stricken families. The BMW Group of South Africa initiated such gardens in some of the schools

after having been approached by some principals for donations to buy food for children who came to school with empty stomachs and could not learn effectively. Photos 5.3 and 5.4 refer to the BMW Group of South Africa's *seed programme*.



**Photo 5.3** The BMW Group of South Africa's programme in S1



**Photo 5.4**Vegetable garden established by the BMW Group of South Africa Seed programme in S1

The BMW Group of South Africa's *seed programme* is considered by S1 as a pillar of support concerning the schools that participated in this study. The principals, teachers and learners loved the gardens. The lead was taken by one Natural Sciences and Technology teacher to maintain the garden. Contrary to the situation at this school, a few of the other schools could not sustain the projects after the people who had started such projects had left.

The data also revealed that S1 and S6 had both flower and indigenous plant gardens. The flower gardens include those that were established through the *BKB* programme. Their main purpose is to beautify the school while they may also be used for other purposes, such as expelling certain types of snakes. The indigenous plant gardens grow local plants. The indigenous plants are used when the learners are taught about water conservation, as they are compared with the jacaranda trees in the City of Tshwane regarding how much water these trees consume per day. The data revealed that learners are taught about the alien plants and the amount of water they consume on a daily basis.

The collected data revealed that S4 received seedling donations from the R3.00 and R5.00 budget plant nursery. The garden in this school was the responsibility of both the school and the community. However, only two community members were working in the garden during the site visits. The owner of the R3.00 and R5.00 budget plant nursery and one of the employees were also at the garden to check the progress made and to provide support if needed. The seedlings were still extremely small. Gardens in S4, S5, S6, S7 and S9 were not sustainable for various reasons, which included lack of involvement of all teachers in the schools and support after the people who started such projects had left. Teachers regard their involvement in garden activities as extra responsibilities in addition to their core activities.

### **5.2.2 Site visits to determine the availability of recycling activities**

The collected data revealed that all the schools were once engaged in recycling either plastic bottles or cans. However, currently only one out of the nine schools, namely S9, is engaged in recycling activities. In all the schools recycling was or is mainly done for plastic bottles and sometimes cans. The bottles are generated by schools because teachers and learners drink water, cool drinks and juice from plastic bottles. This results in the high generation of plastic bottles. In addition, schools with kiosks generate more bottles than the ones without. Even though the bottles may repeatedly be used to fetch water from the taps, ultimately they are thrown away. S2 practised recycling plastic bottles to a point where learners enjoyed it and did not need any supervision. They collected bottles from their homes to take to school.

Concerning cans, the GDoE feeding schemes provide township schools with tinned fish, and this contributes greatly towards the generation of cans every month. In many of the township schools, “the cans are just dumped until the City of Tshwane removes the rubbish”, as indicated by E5. All the schools stopped recycling because of the challenges concerning transporting waste (bottles and cans) from schools to the recycling sites. In S2 the teacher indicated: “transport people would promise to collect the waste, but took so long that the members of the community who resided near the school would complain about the waste”. In other schools they could not obtain transport at all to remove the

waste. Teachers with cars would volunteer but stopped transporting the waste at a certain stage without giving any reasons.

### **5.2.3 Site visits and inspections on the conservation of water**

Taps and toilets on school grounds were inspected with the intention of assessing whether the schools conserved water. As reported in the literature review, the DWA conducts a *Baswa le Meetse* programme to teach learners to conserve water. The visits focused on checking leaking taps and toilets and the usage of water from taps by both the learners and the teachers. The GDoE officials checked the leaking toilets and taps as part of school support to ensure that any leak is fixed.

In five out of the nine schools visited, water was stored in containers. Learners used jugs to drink water and also used jugs or dishes to wash their hands after using the toilets and during lunch time. The Foundation Phase teachers used jugs to help learners wash their hands during lunch time. An attempt was made in schools to fix leaking taps and toilets. The water was usually wasted by senior learners in the higher grades, namely grades 6 to 12, especially those who chose to bring packed lunches from home because they wanted to wash their lunch boxes using running water from the taps. However, the majority of learners received their lunch from feeding schemes, where the plates were mostly washed in the kitchens.

### **5.2.4 Findings on energy-efficiency strategies**

The intention of this visit was to determine whether energy-efficiency actions had been implemented in the schools. It was found that although lights were switched off after school, all the schools still used the old non-energy-efficient globes.

## **5.3 Interviews with officials from selected government departments**

The instrument, namely the interview schedule, was pilot-tested with one government department, namely GD1, and amendments were effected accordingly. Hereafter the

interviews were conducted, and the data were then audio-recorded, transcribed and coded according to the identified interview guide before they were analysed and interpreted. Nine out of the ten intended schools and three out of the three intended government departments, namely GD1, GD2 and GD3, as well as the LG participated in this research study. The researcher's intention was to understand whether EE initiatives by the South African government were effective and also to understand the contribution and effectiveness of EE initiatives of the South African government at a local level, namely the City of Tshwane municipality. Tape recording the interviews are important because the researcher may not be able to capture and remember everything the participants say. The researcher used a tape recorder to record the interviewees' responses, as explained in Chapter 1, Section 1.15.2, while notes were also taken by her as the primary instrument during the data-collection process.

According to Goodwin (2007:45), the data collected through interviews must first be assessed in order for the researcher to analyse only the data that will add value to the study. The coding of data was done during the analysis process and recurring codes were combined to form themes, as this indicates their importance (Babbie, 2007:297). Similar ideas such as portfolios, forms, printed items and conservation formed themes. The topics and themes that the researcher wished to engage the interviewees in were developed by the researcher with a flexible question structure to allow the researcher and the interviewees to develop unexpected themes, as was pointed out in Chapter 4. Unexpected themes included: owl's nest, rubbish bins, forms and printed items. The structure of the questions formed the basis for the categorisation of data and their analysis. The interviewees' responses were transcribed and read carefully with the intention of making sense out of these responses.

### **5.3.1 The subject(s) for which teachers and subject advisors were responsible and the findings derived from the data**

This question was asked to the teachers and subject advisors as they are allocated subjects for which they are responsible. The researcher wanted to establish whether the teachers and subject advisors considered effectively implementing EE content in their allocated subjects. Four subject advisors were interviewed. The data revealed that each advisor was

responsible for only one subject, as he or she was a specialist, as shown in Table 5.1 below.

<b>Subject advisor</b>	<b>Subject responsible for</b>
SA1	Social Sciences
SA2	Economic and Management Sciences
SA3	Life Orientation
SA4	Sotho languages

**Table 5.1: Subject advisors and the subjects for which they were responsible**

The data collected from the schools were divided into two categories, namely educators and heads of department. Both teachers and heads of department were interviewed to determine the effectiveness of the implementation of EE initiatives by government in schools with regard to environmental partnerships programmes, projects and the curriculum. In addition, the researcher wanted to establish the level of knowledge regarding EE, as every subject has some content that addresses environmental aspects. The data were collected from nine out of the ten schools selected to participate in this research. The participation figure was therefore 90%, and this should provide sufficient information for this research to answer the research question. Table 5.2 below shows the subject(s) for which the educators and heads of department were responsible in both the primary and secondary schools.

<b>PRIMARY SCHOOL SUBJECTS</b>	
<b>E1 to E9 (total: 9)</b>	<b>HoD1 to HoD9 (total: 9)</b>
Natural Sciences	Mathematics
Natural Sciences and Technology	Life Skills
Social Sciences	Arts and Culture
Sepedi	Economic and Management Sciences
Afrikaans Home Language	Life Orientation
	English
	Social Sciences
<b>SECONDARY SCHOOLS</b>	

Life Orientation	Mathematics
Social Sciences	Physical Science
Tourism	Life Sciences
	Technology
	Natural Sciences

**Table 5.2 Subjects for which both the teachers and heads of departments were responsible**

This study included a wide range of subjects in both primary and secondary school to enable the researcher to understand whether EE initiatives by the South African government were effective.

### **5.3.2 Understanding of the concept of ‘environmental education’**

The data revealed that the concept of ‘environmental education’ is understood in different ways by the officials from GD1 and GD2. Some understood it as education about the environment, looking after it and how it contributes to our daily lives. One official from GD1 felt that the intention of EE is to:

*sensitise people about the environmental challenges so that they can have a positive attitude towards the environment or nature. It is teaching learners and communities about environmental health problems and skills to address these challenges. This includes the commemoration of days such as the Earth and Wetlands days as well as their conservation.*

This explanation indicates that the GD1 official understand the meaning of the concept ‘EE’ and the actions that need to be taken in this regard. It reflects on the activities in which the GD1 officials were once or are currently engaged. EE teaches them about the importance of the environment and on how to care for it.

E3 understands it to mean:

*education concerning awareness of how to take care of the environment by keeping it clean, greening the school yard by planting trees and stop contributing towards global warming, planting vegetables, medicinal plants and flowers in their schools, making compost from vegetables peels, stopping pollution with “pick up litter” activities, learning about alien plants such as weeds, recycling and through programmes and environmental activities such as Baswa le Meetse and Bontle ke Botho.*

In addition, E2 stated that “EE teaches people about the area in which they live, the available resources and considering their sustainable use so that the future generation can also benefit from the same resources”.

In turn, an official from GD2 indicated that “EE pertains to integrated education about the environment in terms of nature, specifically water”. This means it focuses on how water interlinks with our daily lives at home, in businesses and in industries, as water is a resource that needs to be taken care of. Furthermore, EE educates learners and communities about how our daily activities impact the environment and how to go about remedying the impacts, as well as water-use efficiency.

The officials from GD3 understood the concept to refer to education that builds capacity or competencies for sustainable development and action-oriented education geared towards balancing the social, economic and ecological or biophysical considerations or needs. The concept is understood by the LG official as “an integral part of sustainable development and an important part of the country’s understanding of environmental impact and how do they relate to their actions”.

### **5.3.3 How participants found out about the concept ‘environmental education’**

The officials from GD1 found out about EE in various ways. SA2 indicated that they had found out through media such as “television advertisements, newspapers and billboards, especially the City of Tshwane municipality with messages such as ‘Love your city, Respect your environment, do not litter’, pamphlets and handouts”. SA1 mentioned that

she found out through the CAPS, because the subject for which the interviewee was responsible had some environmental content. In addition, SA1 was a member of the Gauteng Environmental Education Forum (GEEF). This is a forum that is comprised of officials from various government departments such as the GDoE, DEA, DWA, GDARD, the City of Tshwane local municipality, the Pretoria National Botanical Garden, universities and EE centres as well as environmental centres. “The concept [of EE] forms part of the content in my subject,” the SA1 indicated. SA4 said: “I knew the concept through officials of the DWA, who had visited our school to talk about the importance of the environment”. The researcher wanted to establish the participants’ understanding of the concept because this was the point of departure.

The data revealed that the Es knew about the concept of ‘EE’ through various ways. Some indicated that they knew about the concept through the GDoE during the celebration of environment days such as Wetlands, Arbour and World Environment celebrations. Accordingly, the subject advisors for Tourism, Social Sciences and Life Orientation organised some activities/field trips for schools to celebrate these days. The purpose of the celebration of such days is to instil patriotism in learners and to focus their attention on ecological challenges so that they are more aware of the negative impact of human actions on the environment. Some of the officials came to know about the concept by studying the DoBE’s policy documents on the curriculum, which include content that addresses environmental aspects or topics. In addition, the subject of Natural Sciences includes topics such as *Life and living*. Three interviewees responded that they learned about the concept through studies at tertiary level, as one had obtained a national diploma and two a bachelors’ degree. E1 indicated that “the concept was introduced by interacting with a non-governmental organisation that engaged with our school on waste management”. The concept was known through working with GD1 and GD2.

The GD3 official knew about the concept through the “UNESCO programmes and conferences such as the Tbilisi principles, World Summit on Sustainable Development (Rio 92) and the UN Decade on Education for Sustainable Development”, while LG4 knew about it “through studies at the University of South Africa towards a bachelor of honours in sciences”.

#### **5.3.4 The level of effectiveness of EE initiatives undertaken by the South African government**

Regarding the effectiveness of EE initiatives undertaken by government, SA2 stated as follows:

*the EE programmes' level of effectiveness was low because they were not supported and/or monitored, which also led to the lack of sustainability of their EE initiatives. There were too few environmentalists to support and ensure effective implementation of these initiatives.*

When asked about the effectiveness of EE initiatives, E4 mentioned that:

*the GDoE should consider making EE an independent subject to receive the attention it deserved because it was now integrated in some subjects, for example, the Social Sciences Senior Phase Grade 7 topics such as the natural resources and conservation in South Africa and Intermediate Phase Grade 4 topics such as water in South Africa and health and environmental responsibility: water as an important need and local environmental health in Life Skills Intermediate Phase Grade 4.*

An official from GD1 indicated: “We also undertake excursions to botanical gardens to learn about biodiversity, medicinal plants, indigenous plants and deforestation”.

From the above responses, it is clear that officials from GD1 are aware of the integration of EE into the subjects; however, they think if it is to be effective, the DoBE should consider making it an independent subject. Furthermore, the data revealed that other departments such as the GDARD and DWA assist schools with regard to EE. An official from GD1 stated:

*The Department of Environmental Affairs provides us with trees to plant especially on arbour day while the Department of Agriculture provides us with garden tools. However, I cannot say is effective because things are done as*

*events, they happen for a day; no one comes back to monitor the progress after that. The event will come again the following year.*

### **5.3.5 Factors that can/do lead to the failure or the partial effectiveness of EE initiatives**

Projects and programmes were implemented haphazardly and were mostly implemented in schools by partners without the knowledge of the subject advisors (district). A teacher would be selected to coordinate the project or programme, but after the period of the initiative lapsed, the project or programme would stop due to the lack of monitoring and support. According to E1, subject advisors should be involved to ensure effective monitoring and support because they interact with schools on a daily basis. The collected data further revealed the lack of resources to address challenges.

Various reasons were cited by eleven educators out of eighteen (E1-9 and HoD1-9) as contributing factors to the failure or the partial effectiveness of EE initiatives. The factors included:

- The lack of monitoring and support after the project or programme period lapses. The period at which the project or programme lapse is contextual. Ten educators indicated that monitoring and support stops on the day on which the period of the project or programme lapse because funding also stops.
- Three mentioned that monitoring and support stops after the champion left the school or is promoted to a higher post and six said monitoring and support will stop because other teachers regard EE activities as an extra to their duties leaving the champion with more work as the people who started the project shall have left.
- Not all educators integrate EE into their subjects despite the fact that it forms part of the subject content, only the champions do integrate.
- All eighteen educators indicated that workshops are not conducted to ensure effective implementation.
- Three educators indicated the teachers do not make it practical; they teach it as a theoretical subject.
- Three educators said that educators do not make it interesting for learners.

- EE is perceived by all eighteen educators to be part of certain subjects such as Life Orientation, Natural Science and Technology, Social Sciences, Technology and Geography.
- The CAPS demand much time from the educators. E2 remarked: “We were an Eco-School for about seven years but because of the lack of time [after the introduction of CAPS] the school terminated its membership with [the] Wildlife Environmental Society of South Africa”.

The reason for terminating the membership was because the school was expected to design lesson plans for both the GDoE and WESSA (*Eco-Schools* lessons) and this posed a great challenge to the school because they all had deadlines for the submission of finished tasks. E2 continued to say:

*We are now doing EE in a lesser and more relaxed way, we still encourage our learners to have gardens at home and to plant trees to address some content in subjects such as Social Sciences, Natural Sciences, Life Orientation and Languages. Language is considered as a vehicle towards the realisation of effective implementation of EE.*

In some schools, such as S4, the gardens become the responsibility of the community. Learners and teachers are not involved, as teachers regarded EE activities as an adjunct to their teaching. Following the factors mentioned above in terms of the collected data, it can be concluded that EE is not given enough attention in schools. The main problem is that teachers regard it as an additional load on top of what they already have to carry.

### **5.3.6 EE programmes and/or projects government departments implement and the findings derived from them**

The programmes or projects implemented included the *recycling* of plastic bottles and/or cans, greening, or both. Greening was done in the form of gardens, which included *BKB* and vegetable, medicinal, indigenous and flower gardens in S1, S3, S4, S6 and S7. An official from the GD1 indicated that programmes or projects included:

*The Bontle ke Botho programme that is implemented by the City of Tshwane municipality, the BMW seeds programme by the BMW Group of South Africa, medicinal plants donated by the Pretoria Botanical Garden, the vegetable seedlings donation project by the R3.00 and R5.00 nursery, the water conservation (water wise) project by the DWA and recycling.*

It is worth mentioning that EE is “crucial to promote sustainable development and to improve the capacity of people to address the environment” and development issues, as noted by Simalumba (2011:26). The data from the educators revealed that one teacher in a school is appointed to coordinate the project or the programme, but when the period for the project lapsed, teachers did not continue; instead, they stopped too. For example, the *BKB* gardens, *energy-efficiency* and *recycling* activities stopped in schools such as S6 after LG officials stopped their post-programme monitoring and support to the school. The data from the educators revealed that the same situation occurred with some schools that joined the *Eco-Schools* programme. According to MMAEP (2013:1–5), the sustainability of recycling projects at schools becomes a challenge after the external support is withdrawn. It is essential to research how many *Eco-Schools* are effective in implementing and sustaining the above-mentioned projects/activities, as well as their affiliation as *Eco-Schools*. The following form part of the projects or programmes implemented by the Department of Environmental Affairs:

- The Fundisa for Change programme for environmental learning through teacher education focusing on CAPS support to enrich and strengthen teaching and learning on the environment and sustainability content as outlined in the curriculum.
- The learnership programme providing an opportunity for the youth to acquire experience, qualifications and skills in the area of the environment and sustainability content applicable to local communities.
- Environmental and sustainability career-development programmes for schools to create awareness of careers, jobs, occupations and skills for the green economy.
- Outreach programmes to raise awareness of environment and sustainability content through publications, flyers, media and workshops, among others.
- An environmental venture creation / eco-partnership development programme to build entrepreneurship in the environment or a sustainable field.

- Community and employee EE projects and programmes.

### **5.3.7 Data on the effectiveness of EE partnership projects and programmes in schools and findings based on them**

An interviewee from S1 remarked that:

*In some schools the partnerships with the GDoE were effective. EE initiatives were effective because certain schools had school gardens and they used recycled materials to make posters. The GDoE collaborated with the DWA and the LG for the celebration of special days such as Arbour Day.*

It was indicated by E3 from S1 that they “maintained the vegetable garden started by the BMW Group of South Africa’s *seed programme* because the majority of learners still lived in poverty”. The gardens were a boost to the GDoE’s feeding scheme that was sometimes not able to provide sufficient vegetables to schools. At times, learners received vegetables to take home. In addition, WESSA worked closely with the regional coordinators from the DWA on the *Baswa le Meetse* competition. Furthermore, the *MTN Foundation* of South Africa sponsored prizes in competitions; for example, the winners of the *Baswa le Meetse* competition received 21 computers loaded with educational software plus free internet access for 12 months.

This indicates the effectiveness of the projects and/or programmes. An official from GD3 mentioned that:

*With the formation of the National Environmental Educator’s Forum, partnerships have been strengthened across the three spheres of government, government agencies, business and civil society reaching out to specific target groups. There is a behavioural change though different target groups often lack the financial resources to practise environmental friendly activities. The partnership with regard to the implementation of EE projects and programmes in schools is satisfactorily effective.*

Contrary to what is mentioned above, the collected data also revealed that, in general, partnerships regarding project/programmes are faced with sustainability challenges. The data revealed challenges such as lack of integration of the projects and programmes with the relevant content that is taught in a term for a specific grade, which leads to initiatives becoming events that are done and celebrated for a particular time; and EE is not compulsory, so a few schools participate in the projects. There are few vegetable and medicinal gardens that are still cared for in the schools. Subject advisors are sometimes invited on the days of the celebrations or prize-giving and they do not monitor the projects after the competition. The data revealed that when asked how they integrate EE initiatives with the content they teach, Es indicated that they were not trained in this regard, while those who were trained mentioned the lack of proper teacher training in EE. Teachers think EE is a subject that is not compulsory, so some of them do not participate in EE projects. The initiatives are therefore separate from what they do in the classroom environment, hence, initiatives become add-ons, as stated by E3.

It is interesting to note that teachers who coordinated the project disengage once the people who started the project leave and no one volunteers to take over. E4 of S4 had this to say: “This does not mean teachers are not willing to sustain these projects/programmes but they just need time, support and monitoring”.

### **5.3.8 The effectiveness of collaboration of various government departments in implementing EE projects and/or programmes**

The data revealed variety of views given by the participants. On the one hand, the data revealed that the DWA signed a memorandum of agreement with the GDoE regarding the implementation of EE projects and/or programmes. The agreement refers to programmes such as *Baswa le Meetse* and *Aqua Enduro*, which data reveal that their implementation is effective. The subject advisors assist the DWA by developing LTSM and also help with the adjudication of EE competitions such as the *Baswa le Meetse*. An official from the DWA indicated that interaction is fairly satisfactory, but more could be done to maximise officials’ interaction.

In addition, the officials from various government departments, who are members of the GEEF, met at provincial level to discuss environmental issues, especially the implementation of EE projects and/or programmes. The officials are from departments such as the DWA, DEA, GDoE, GDARD and the City of Tshwane municipality.

The GDoE, DWA and DEA joined forces on greening activities. The GDoE teaches learners on greening and the DEA provides trees and assists the GDoE with their planting. The DWA explained good times for watering plants to learners. An official from the DEA mentioned that “EE is a theme that is applicable across governments, which includes Water Affairs, Education, Environmental Affairs, Agriculture and Rural and Development and the City of Tshwane municipality”.

The official further mentioned that the adoption of the outcomes approach of government, which entails the coordination of reporting, monitoring and evaluation of 12 government outcomes and a cluster approach and reporting structure such as working groups, MinTech and MinMec collaboration across government, has become effective.

Contrary to what is mentioned above, GEEF Member from GD2 indicated that there was no collaboration, while GEEF Member from GD1 asserted that existing collaboration needed to be improved through proper planning. This GEEF member further contended that various departments implemented EE projects and/or programmes in silos, which contributed to the duplication of projects and/or programmes. This means EE initiatives are implemented partially.

### **5.3.9 The availability of a coordination team that ensures effective implementation of EE in schools**

The data indicated that although there is interaction among the government departments, coordination systems were not in place consistently. The educators’ responses showed an interest in having coordination in place, because they thought it would ensure the monitoring and support of three projects and five programmes and therefore their effective implementation in schools.

### **5.3.10 Training received by the participants in EE and findings**

The data on training provided varying results, from participants receiving no training, attending departmental and WESSA workshop, to receiving tertiary education. E6 stated: “I attended one WESSA workshop, one NGO workshop and one in-service training” LG3 official said “I have tertiary qualification (bachelor of science)”.

### **5.3.11 Data on participants’ qualifications in EE**

The data revealed that one GD2 official had no formal education in EE, while one LG3 official had a degree in environmental management. The remaining two GD1 officials did not have qualifications in EE. The data revealed that participants’ qualifications ranged from having passed a module to having a certificate, national diploma, first degree or honours’ degree in the field of environment, engineering and science.

### **5.3.12 Target groups and the implementation of EE programmes and/or projects**

The results from the DWA showed that the *Baswa le Meetse* competition targeted Grade 6 learners, *Aqua Enduro* targets Grade 11 learners who were taking Mathematics and Physical Sciences, while the *Youth Water Prize* targets both Senior Phase and FET band (grades 9 to 12) learners. The learners had to complete a project, for example a water purification model that should be functional when tested. The *Youth Summit* targeted all learners who participated in various competitions from grades 6 to 12. The DEA data revealed that EE programmes and/or projects cut across the Human Capital Development pipeline: schools and communities, universities, Technical, Vocational Education and Training (TVET) colleges, workplaces/labour market and sector education and training authorities. The interviews further revealed that the target groups for LG4 were learners, NGOs, ward councillors, community structures, educators, employees and community

development workers, including both the primary and secondary schools, especially with regard to the establishment of gardens.

### **5.3.13 Level of fairness of EE project competitions**

None of the subject advisors from the GDoE were ever involved in the competitions. The data reveal that 8 out of the 20 participants indicated that they were never involved, four educators indicated that competitions were very fair, one pointed out that competitions were less fair, one said they were not fair, while six were not sure.

### **5.3.14 Means of ensuring the effective implementation of EE programmes and projects and their sustainability**

The interview with a GD2 official revealed that various strategies were employed to ensure the effective implementation of EE programmes and projects. The official stated the following:

*The mobilisation through the media during the initial stages to ensure everyone was reached in connection with the EE programmes and projects, workshops were conducted for a group of teachers, learners and communities while guidelines were also explained to ensure understanding of how to go about carrying out and sustaining the projects. Support was also provided after the workshops for those who needed it as well as after the competitions for those who won to ensure sustainability. Another strategy is through sound project management capacity building, and provision of resources for monitoring and evaluation including conducting needs analysis prior to developing any programme for the identified target group.*

This proves the focus and, therefore, the effectiveness of initiatives and ensures the undertaking of a joint venture concerning implementing effective EE projects or programmes while minimising, if not avoiding, duplication of activities completely. All departments and NGOs should work together in monitoring and supporting as well as

ensuring the availability of resources, as stated by a GD2 official. The issue of the lack of various resources was explained in Chapter 3 as a challenge towards the sustainability of projects.

In addition, the Balebogeng Primary School still had the solar heater, the JoJo tanks and the shade structure that the school had won by participating in the *BKB* competition. It is worth noting that Balebogeng was not among the schools that were selected for observations; however, the school was observed during school support, as discussed in Chapter 3 in Section 3.13. The solar heater was visible from the roof of one of the classrooms at the school, while the JoJo tanks and the shade structure were observable from the school premises (See Appendix D). The JoJo tanks are used to capture rain water, which is used to water the crops and plants, while the shade structure is used as a venue for meetings, for example with the parents. The solar heater was unfortunately damaged by a storm.

According to a GD1 official, the EE programmes and projects that were linked to the curriculum, monitored by both the subject advisors and partners, were sustainable.

### **5.3.15 Involvement of the curriculum unit**

The subject advisors assess the relevance of the programme and discuss this with the partners while they also provide support during the implementation of the initiatives. The involvement is, however, not effective because few subject advisors are involved due to lack of coordination of environmental education programmes and projects. Furthermore, some programmes and projects are implemented without the knowledge of the subject advisors which makes it difficult for them to be involved.

## **5.4 Document-analysis**

Document-analysis was employed because it is a valuable source of information, as substantiated in Chapter 1. It provides evidence of the data provided during the interviews and also supplements some information that might have been left out by the interviewees or not observed by the researcher. The intention of documentary analysis was to have a

better understanding of whether the implementation of EE initiatives by the South African government was effective. The researcher used both old, new and printed documents, because they addressed the research question, as recommended by Marshall and Rossman (2011:160-161; Elton-Chalcraft, 2008:78).

#### **5.4.1 Portfolios**

Four portfolios were accessed and analysed in this study. Two were accessed from a former *Eco-Schools* from S2, while the others were accessed from schools that had won the *BKB* competition, namely S1 and S6. An explanation of the CAPS documents is also provided.

##### **5.4.1.1 Bontle ke Botho portfolios**

The two portfolios that were analysed contained evidence of the process that was followed and were presented for assessment at the end of the process. The portfolios prepared for the *BKB* portfolios competitions from S1 and S6 were analysed with the purpose of attaining in-depth knowledge regarding the process followed from the beginning until the days on which the competitions were conducted. In addition, the researcher wanted to establish the extent of the involvement of subject advisors and other departments in the process of compiling the portfolios and the effective implementation of the programme.

The portfolios contain photographs showing the schools before the programme/project was implemented and after the programme/project was implemented, staff members from the schools, partners and learners. Furthermore, descriptions of the activities conducted are also kept in the portfolios, such as meetings at which the inception of the programme/project was discussed. The minutes of such meetings were provided as evidence.

#### **5.4.1.2 Eco-Schools portfolios**

The two *Eco-schools* portfolios from S2 were compiled by the *Eco-Schools* coordinator for two years, namely 2012 and 2013. The researcher analysed two schools' portfolios for the years mentioned above. The school started by compiling a school profile and then conducted an audit. The school established an Eco-committee that was made up of eight members whom each represented a grade from R to 7, with extra members: one groundsman and an administrator. This committee was responsible for the organisation of *Eco-Schools* activities. Meetings were held by the *Eco-Schools* committee and minutes were taken. Copies of the minutes were filed, for example, the first meeting was held on 24 November 2011 and then a series of meetings followed. The minutes indicate the dates on which the meetings were held, members who were present, the agenda and the decisions taken. The committee discussed issues regarding planning, the main theme and sub-themes to be covered and how to roll out the projects.

The theme of the programme was environmental management, focusing on sub-themes that included the development of wildlife at the school environment, conservation of water and electricity, recycling and establishment of environmental clubs for learners. The analysis of the portfolio revealed that an audit and review were conducted by S2 while an affiliate to the *Eco-Schools* programme, as outlined below.

#### **The first and second Eco-School audits and reviews**

The *Eco-Schools* concept was discussed in Chapter 3, Section 3.10.1. S2 is a former *Eco-Schools* that conducted an audit and review as one of the steps that an Eco-School should follow, as discussed in Chapter 3. The first whole-school review was conducted on 1 March 2012 and the second review took place on 22 October 2013. The purpose was to identify the environmental management needs and environmental learning opportunities of the school. A checklist was provided with a key code of 1 = weak; 2 = not good; 3 = ok and 4 = strong. The total score for each of the five themes would assist the school to decide on what theme to choose based on the weaknesses and strongest themes. The five themes that were reviewed over two years under environmental management at S2 are shown in Table 5.3 below.

<b>Review no. 1 on 1 March 2012</b>	<b>Review no. 2 on 22 October 2013</b>
<ul style="list-style-type: none"> <li>• Theme 1: Resource use</li> </ul>	<ul style="list-style-type: none"> <li>• Theme 1: Resource use</li> </ul>
<ul style="list-style-type: none"> <li>• Theme 2: Local and global issues</li> </ul>	<ul style="list-style-type: none"> <li>• Theme 2: Local and global issues</li> </ul>
<ul style="list-style-type: none"> <li>• Theme 3: Nature and biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>• Theme 3: Nature and biodiversity</li> </ul>
<ul style="list-style-type: none"> <li>• Theme 4: Healthy living</li> </ul>	<ul style="list-style-type: none"> <li>• Theme 4: Healthy living</li> </ul>
<ul style="list-style-type: none"> <li>• Theme 5: Community and heritage</li> </ul>	<ul style="list-style-type: none"> <li>• Theme 5: Community and heritage</li> </ul>

**Table 5.3 The five themes reviewed under environmental management at S2**

The themes were similar for both years and they were followed by lesson plans that were taught every day. The themes provided a focus while the lesson plans were aligned to these themes. Although S2 won the *Eco-Schools* platinum flag, it is no longer an affiliate to the *Eco-Schools* programme. This is because of the lack of integration of the *Eco-Schools* programme with the DoBE curriculum, as the interviewee from S2 indicated that both the GDoE and *Eco-Schools* officials wanted their lesson plans. The *Eco-Schools* programme would be sustainable if there was integration of the curriculum and *Eco-Schools* programme so that teachers would have one lesson plan that addresses both the *Eco-Schools* programme and the DoBE curriculum.

#### **5.4.1.3 The Curriculum and Assessment Policy Statement**

The CAPS documents for each subject have content that provides some opportunities to integrate EE. A sample of three subjects was taken for this research to check the inclusion of environmental content into these subjects, namely Social Sciences, Life Skills, and Natural Sciences and Technology for grades 4 to 6, in which environmental content was noticed. The integration of environmental content between the *Eco-Schools* programme and the GDoE would ensure sustainability of the *Eco-Schools* programme and the *Eco-Schools* programme would help with the training of teachers in EE.

#### **5.4.1.4 Photographs**

Photographs were taken on the day when the City of Tshwane held a World Environment Day celebration at S7. The photographs show the event during which the City of Tshwane mayor and the officials attending the celebration established a vegetable garden in school S7. In addition, the photographs show the donations from the City of Tshwane to S7, which included garden tools such as spades, forks, wheelbarrows, watering cans and seedlings, to enable the school to sustain the established vegetable garden.

#### **5.4.1.5 The Youth Summit on Water and Climate Change outline document**

The Youth Summit on Water and Climate Change outline document (DWA, 2012b) explains that “the *Youth Summit on Water and Climate Change* is an intensive education programme that addresses water, environmental issues and careers”. The summit is a week-long event taking place in June each year to align with Youth Month in South Africa. It includes the initiatives conducted on educational youth programmes from various units such as water-use efficiency and working for water quality. The key objective of the summit is to cause the youth to converge at a centralised venue to share knowledge on issues relating to water and climate, fostering awareness of water and the environment, increasing enthusiasm among the youth to pursue a water-related career, integrating youth education programmes for maximum impact and exposing learners and educators to topical issues on water and climate change (DWA, 2012b). In addition, learners have access to various programmes and activities, which include the following:

- Excursions to various sites such as water-treatment plants and river health projects.
- Youth debates: Learners participate in a forum of debate on water and climate change where teams compete against each other.
- Clinics: Experts on water and climate change provide lectures on topical issues.
- Exhibitions expose learners to various stakeholders in the water sector to exhibit and discuss water sector careers and the latest technologies pertaining to water.
- African participation: The summit provides a session for out-of-school youths, which is attended by the youth from the African continent to provide an opportunity for

countries in Africa, for example, to share different youth programmes implemented in the water and sanitation sector and to address challenges of climate change.

The national awards ceremony is hosted on the last day by the Deputy Minister of Water and Environmental Affairs to acknowledge excellence in teaching and learning on issues pertaining to water and climate change. Learners who competed in various action projects of the department such as the *Baswa le Meetse Award* and *youth debates* receive prizes and certificates of excellence from the minister at the ceremony. The annual water summit ends with a celebratory function.

#### **5.4.1.6 Attendance register**

An attendance register signed by the teachers at one of the meetings that was organised by the subject advisor from Tshwane South district, where the DWA official distributed and explained the entry forms, was accessed. Thirty-two teachers who attended the meeting received *Baswa le Meetse* entry forms, which they were told to complete and submit to the DWA by the end of December 2014.

#### **5.4.1.7 Programme**

A formal programme dated 26 November 2014, was obtained during the celebration of the *Baswa le Meetse* competition. The purpose of the day was to present a media classroom to the Midrand Primary School in the Gauteng province. This was the school that won the *Baswa le Meetse* competition in 2014. The media classroom was resourced with 21 computers donated by the *MTN Foundation*, which partnered with the DWA. This information concurs with what was mentioned by the interviewee of the DWA. The celebration confirms that the *Bawsa le Meetse* competition is a collaborative effort by the GDoE, DWA, Arts and Culture, and the *MTN Foundation*, which were all represented. The Gauteng DoE pillar no. 6 advocates modernised digital green schools with ICT infrastructure and equipment, such as tablets, iPads and desktop computers, to be utilised by learners in the classroom instead of textbooks and smartboards to be utilised by

teachers instead of the traditional chalkboards. This is in agreement with the supply of computers to the Midrand Primary school by the *MTN Foundation*.

#### **5.4.1.8 Groen Sebenza jobs fund partnership programme document**

According to the DEA, SANBI, in partnership with 32 environment/biodiversity organisations, has embarked on a major skills development and job creation pilot programme, *Groen Sebenza* (DEA, 2013). The programme is a jobs fund partnership project, consisting of organisations from all tiers of government, NGOs and the private sector (DEA, 2013). Its purpose is to develop priority skills in the biodiversity sector to create sustainable job opportunities for 800 unemployed graduates and those with Grade 12 certificates.

The DEA, as one of the partners in this programme, is implementing an FET certificate training programme in a New Venture Creation Learnership (NQF Level 4: 66249) for 50 unemployed learners (30 unemployed graduates and 20 unemployed applicants with Grade 12 certificates). The applicants should be interested in establishing or should have established small or micro environmental enterprises (new business ventures) or in becoming involved in environmental enterprise expansion. The department is, therefore, looking for interested applicants who are qualified in the occupations mentioned below to participate in the *Groen Sebenza* programme and to establish micro environmental enterprises. The qualifications include the following: environmental educators (5), environmental technicians (10), enforcement and regulatory officers (5), natural resources community officers (10), biodiversity (10), eco-tourism enterprise / hospitality workers (10).

Applicants from among the rural, distressed and peri-urban unemployed youth from previously disadvantaged backgrounds who also meet the requirements mentioned below are invited to apply for the above-mentioned positions (DEA, 2013).

- For the school leaver placement: a Grade 12 certificate.
- For the graduate placement: a national diploma or first B-degree.
- South African citizenship.

- A demonstrated and clearly articulated commitment to the environment.
- A commitment to career development in the environmental sector.

Successful graduate candidates will be offered a stipend of R7 100 and school-leavers (matriculants) will receive R4 500 per month, and must commit to a contract of two and a half years with their host employer.

#### **5.4.1.9 Environmental centres and environmental education centre programmes**

Issues regarding the partnership of environmental centres and EE centres with the GDoE in implementing EE were discussed in Chapter 3. The data revealed the availability of programmes for two environmental centres (the Delta Environmental Centre, 2010, Walter Sisulu Environmental Centre, 2011) and one EE centre (Mogale's Gate Environmental Education Centre, 2011), which were provided to the subject advisor for Social Sciences in the Tshwane South district to facilitate the effective joint planning of EE programmes and their implementation. The programmes outline aspects such as the activities to be implemented during each term for the Foundation, Intermediate, Senior and FET band subjects, which include Life Skills, Natural Sciences and Technology, Life Sciences and Social Sciences. The programme also covers celebration of environmental days and the contact details of the centres. Furthermore, the Delta environmental centre conducted a workshop for subject advisors on exploring the concept of sustainable development (the Delta Environmental Centre, 2011).

The Delta Environmental Centre provides training for teachers and subject advisors on EE in the form of a short course accredited by the University of Johannesburg's Faculty of Education with 14 credits at NQF Level 5.

#### **5.4.1.10 Induction workbook for interns in the environment and biodiversity sector**

The workbook provides basic information regarding interns (Raven & Rosenberg, n.d:vii). It can be used by any department to assist interns with regard to knowing who they are and where they are heading, finding their feet in terms of the policy framework, getting the basics right and knowing how to make the most of an internship learn and advance programme. The aim of this book is to provide a bridge between the interns'

academic training and the workplace and to help interns towards working for a better environment and a better life for all (Raven & Rosenberg, n.d.:vii). The book consists of a series of questions/activities to help interns prepare themselves for the work environment. This workbook assists in training interns to gain practical experience of a better environment, which entails environmental management.

#### **5.4.1.11 Expanding access to career information services document**

The document indicates that the demand for career guidance exceeds the supply, resulting in many people not being able to access it (DEA, n.d.(a)). The DEA highlights that employed people, tertiary students, mothers with young children, women returning to work, older adults, people with disabilities, remote communities and a range of disadvantaged groups are among those whose needs are not adequately catered for. This therefore calls for public provision of career guidance services by private, enterprise-based and community-based entities. However, a policy challenge is to find ways of stimulating such involvement through partnerships and outsourcing, while schools need information about training and qualifications to support effective development of the workforce and identify career and development pathways (DEA, n.d. (a)).

According to Mathiba (2014:n.d), the Environmental Sector Skills Plan (ESSP) and the Human Capital Development Strategy (HCDS) have confirmed that students pursue environmental studies but do not necessarily develop a clear picture of the world of work. The workbook document focuses on the biodiversity sector but also provides broader environmental sector information, while acknowledging that schools need information about training and qualifications to support the effective development of the workforce and identify careers.

### **5.5 New themes and or concepts grounded in the data that was collected from S2**

This section addresses the unexpected themes or new concepts emanating from the portfolios.

### **5.5.1 An owl's nest**

S2 made an effort to attract wildlife in the school environment, because the learners were in an urban environment wherein they cannot see wildlife in their natural habitats.

*The school realised the learners stayed in towns and that few of them had the opportunity to see wildlife in their natural habitats. The school would try to provide an opportunity for learners to address this area.*

An educator from S2 and a member of the *Eco-Schools* committee asked an employee of the Parks Board to assist them with the building of an owl's nest, as the school was aware that there are many owls in the area. Currently, there are two owls staying in the nest.

### **5.5.2 Engagement with the environment**

Regarding engagement with the environment, E1 stated the following:

*We were aware that littering on the ground was a problem at the school and discussed the issue. The intention of discussing this aspect was to educate learners on the negative impact of littering in the environment with reference to the various types of littering, and whether the littered material is biodegradable or not.*

The school planned to make learners aware that littered material could be used to make gifts and that paper could be recycled so that trees can be conserved.

### **5.5.3 Involvement of parents and the community**

In order for schools to engage learners, they first needed to involve the parents and the community. This is important for the schools, as they need the support of parents, who would in turn support their children.

#### **5.5.4 Clubs**

In an attempt to teach environmental aspects the school established environmental clubs. The school would try to make learners aware of all environmental aspects identified during the audit and address them through environmental clubs. Teachers were sure that learners could not distinguish between good and bad plants, for example, or those that used the most water. They did not plant trees and therefore did not observe how they grew, while they did not know which trees to plant. S2 agreed that special days are identified and indicated in the term programme, including tree planting day. This fact concurs with what was mentioned by one of the interviewees, namely E1 from the S2, who stated that learners planted trees at the school and were also given some trees to plant at home. Willow Feather Farm donated 1 500 trees, which were sufficient for each learner to plant a tree at school, according to the interviewee. Learners were also given one tree each to plant at home. They were required to report on how the trees were growing at home.

#### **5.5.5 Cushion**

The school that won the competitions received a beautiful cushion that bore the name of the project, *Bontle ke Botho*. S1 won the *BKB* competition for having the best food and medicinal gardens. The cushion was placed on a sofa in the principal's office. The school started the garden with the help of the BMW Group of South Africa's *seed programme* after one of the retired principals realised that some learners came to school hungry because their families were poverty-stricken, as explained earlier. The principal approached the BMW Group of South Africa *seed programme* and asked for its assistance. The BMW Group then offered the school seedlings. A vegetable garden was established, which is still well cared for and its produce contributes towards the GDoE's feeding scheme.

### **5.5.6 Rubbish bins**

The rubbish bins were inspected during the celebration of World Environment Day. S7 was given rubbish bins bearing the City of Tshwane municipality logo. The rubbish bins were labelled as the City of Tshwane “cans” and “plastic”. The intention of donating the rubbish bins was to encourage recycling in schools.

## **5.6 Forms**

Forms relating to the implementation of EE were obtained, which included application and registration/entry forms. The explanation of these forms follows below.

### **5.6.1 Application form: Funding of food production unit**

S5 completed an application form to apply for the funding of food production resources that included seeds, garden tools and water provision. The Department of Agriculture promised to dig a borehole that would be used to water the crops. The form actually comprised a questionnaire that assesses the situation of the school in terms of the availability of water and land/space and the activity intended to be practised, such as planting vegetables, flowers and fruit or poultry farming. The school had started with the process by completing the form.

### **5.6.2 Baswa le Meetse entry form**

The *Baswa le Meetse* entry form was analysed to understand the process of entering the competition. To enter the competition learners/schools first had to register. The form outlines the background, aims and objectives, who qualified for participation, categories, themes, general competition rules, how to be involved, details regarding support for the interested schools/learners, judging criteria, the selection process and contact details of the national office. The schedule for the competition is as follows: the closing date for the submission of registration forms is December of each year. The district auditions are in

January, the provincial competitions in March and the national competitions and awards and the Youth Summit in June. The schools are asked to mark the category in which they are interested, among the following: music, poetry, drama, poster and praise singing. The prizes are outlined in Table 5.4 below.

PROVINCIAL		NATIONAL	
PRIZE	AMOUNT	PRIZE	AMOUNT
1 <sup>st</sup> prize	R4 000	1 <sup>st</sup> prize	R6 000
2 <sup>nd</sup> prize	R3 000	2 <sup>nd</sup> prize	R5 000
3 <sup>rd</sup> prize	R2 000	3 <sup>rd</sup> prize	R3 000

**Table 5.4: Prizes for the competition at provincial and national level**

The rules of the game state that 50% of the prizes won is for the learners and must be utilised for their educational needs, while the remaining half should be spent on purchasing school resources.

### **5.6.3 Aqua Enduro guidelines and entry form**

Aqua Enduro is one of the initiatives aimed at addressing the skills shortage in the scientific and engineering disciplines and identifying learners who have a passion for water and the required determination and discipline to pursue a career in the water sector. The initiative stems from World Water Monitoring Day, celebrated on 18 October every year. The day highlights the importance of monitoring the quality of water both as a resource and as drinking water. The intervention projects are identified by both the educators and the learners and are conducted in partnership with the *Eco-Schools* programme. Importantly, the identified problems should be water and sanitation-related and the teachers and learners should develop a plan to solve those problems.

The *Aqua Enduro* competition targets Grade 11 learners who take Mathematics and Physical Sciences, while focusing on the impact of climate change on water resources. The guidelines outline the selection process for the participating finalists with the dates

for every step to be taken. Nine learners, each from one province, compete on a given topic. As the final event takes place in one of the nine provinces, the DWA covers all the costs of the finalists and the supporting educators' travelling, accommodation and meal expenses. Both the DWA and the GDoE support the provincial team of six learners. They are responsible for the logistical arrangements, supervising learners and accompanying them to and from the events in terms of their respective provinces. Prizes to be won include the following:

- Floating trophies for the winning provincial teams.
- Full water sector scholarships for the first three winning learners.
- Acknowledgement for individual excellence.

#### **5.6.4 The South African Youth Water Prize registration form**

The South African *Youth Water Prize* registration form was accessed during the interviews with a GD2 official. The South African *Youth Water Prize* is a science and technology project that targets Grade 9 to 11 learners not older than 20 years. One of the objectives of the project is to promote the protection of South Africa's natural resources.

The learners should identify problems related to water, such as water pollution or water wastage in their schools, undertake research on it and recommend a solution to solve the problem. It includes two categories, namely:

- An awareness research project on the identified problem, taking action and recommending a solution and
- An invention that can be used to solve the identified problem. The invention should be functional when tested.

This project can be done individually or in groups of not more than three learners who have a special interest in science and technology and are innovative and passionate about water and the environment. The competition begins at provincial level and then proceeds to the national level. The national winner represents South Africa in Stockholm for the junior water prize to compete with learners from 30 countries. Important dates are outlined such as the closing dates for entry and dates for the workshop, project

submission and the provincial and national competitions. The prizes for the winners are as follows:

**1<sup>st</sup> prize:**

- A bursary from the DWA(for a career in the water sector),
- R15 000 towards tertiary education at the University of Natal (optional),
- A ticket to Stockholm to participate in the junior water competition,
- A subsistence allowance of R3 000 for an educator and a R2 000 subsistence allowance for a learner and
- An R8 000 cash prize plus a computer/ laptop.

**2<sup>nd</sup> prize:** A R6 000 cash prize plus a computer/laptop.

**3<sup>rd</sup> prize:** A R4 000 cash prize plus a computer/laptop.

## **5.7 Printed items**

This refers to printed items such as the *Eco-Schools* platinum flag, T-shirt and business card that were accessed at S2, S7 and S4. All these printed items were aligned to the aspects of environmental education which are relevant to this study.

### **5.7.1 Eco-schools platinum flag**

The Eco-Schools platinum flag was accessed on the day the interviews were conducted at S2, which is a former *Eco-School*. Although the school is no longer affiliated to the Eco-Schools programme, it still has the platinum flag. However, the flag could not be hoisted as the school was not participating in this programme any longer. The colours of the flag are white, green and blue, bearing the title “Eco-Schools”.

### **5.7.2 T-shirts**

All the learners and teachers in S7 were given T-shirts printed with the words “World Environment Day”. The T-shirts also bear the logos of the City of Tshwane and UNEP as partners of the event. The City of Tshwane municipality logo reads “City of Tshwane

Igniting Excellence”, while the UNEP logo reads “Think. Eat. Save. World environment Day 5 June”. The purpose of the T-shirts is to spread the message to the communities by those who wear them.

### **5.7.3 Business card**

A business card was accessed at S4 the day on which the interviews were conducted. The researcher found that a school that received seedling donations kept a business card of the R3.00 and R5.00 budget plant nursery. This was to ensure that the details of the nursery were available for anyone that wished to contact them when the need arose. The details on the card included the name of the nursery, the nursery website, the account e-mail address, the official e-mail address, both the physical and postal addresses and the telephone numbers.

## **5.8 Conservation**

Issues pertaining to conservation were discussed in Chapter 3, in which water and energy conservation were highlighted. The information regarding the conservation of water and energy was accessed from both the *Eco-Schools* and *BKB* portfolios.

### **5.8.1 Conservation of water and electricity**

S2 regards water and electricity as essential resources in everyone’s life – learners and parents included. This was part of the *Eco-Schools* audit results. The learners were to learn about alternative ways of providing energy. One of the lesson plans was evidence to this fact that learners drew alternative ways of providing power/energy, for example a gas stove, a candle, a wooden fire and a home-built oven. In addition, they learnt to conserve water because the taps were often not tightly closed, causing water leakages. To solve this problem, the school used drag/press taps instead of those that needed to be closed.

Both S1 and S6 engaged learners in the conservation of water by teaching them not to leave taps running and to report leaking taps and toilets. This was done in partnership with the LG.

### **5.8.2 Recycling**

S2 state that people/learners should learn to recycle and reduce the amount of waste. Less waste will reduce the amount of dumping if they employ the re-use approach. Less waste means less mining of new minerals, which will benefit the environment and ensure safe electricity and water. Less waste means less pollution. A few recycling activities focus on domestic and school environments and these include:

- Begin making compost at home and school with kitchen waste to fertilise the soil and recycle.
- Design a recycling programme for waste paper.
- Use less water, electricity and paper, and save these resources.

### **5.9 The Department of Environmental Affairs**

The discussion below relates to the training of teachers in EE to address the need for teacher training in this area. Fundisa is a collaborative programme formed specifically to enhance transformative environmental learning through teacher education.

#### **5.9.1 Fundisa for Change brochure**

The Fundisa for Change brochure provides an outline of the teacher training provided. Fundisa was established in 2010 through a project call from the Biodiversity Human Capital Development Programme led by SANBI and the Lewis Foundation (DEA, n.d.(b)). Further indications are that in providing leadership and ensuring service delivery in the environment sector, the DEA has initiated a comprehensive assessment of the skills demand and supply for the environment sector, which has led to the development of an ESSP. The department points out that the ESSP provides guidance on improving

environmental skills development planning and implementation within the national education, training and development system. Furthermore, the plan influenced the design of HCDS for the biodiversity sector (led by SANBI and the Lewis Foundation), and the Department of Science and Technology's Global Change Grand Challenge HCDS. In addition, links were made with the DWA's HCDS and the HCDS for Forestry, Agriculture and Fisheries.

The National Environmental Skills Development Planning Forum (NESDPF) was established out of these partnerships. The forum is a streamlined, responsive national gathering of individuals from government agencies and partners that are actively involved in catalysing and supporting nationally relevant environmental skills development planning initiatives. To achieve these goals, the NESDPF supports several groupings focusing on addressing the scarce and critical skills outlined in the ESSP. This includes the Fundisa for Change partnership in accordance with which the DEA provides additional financial support. The DEA provides the leadership in all environmental skills plans and has contributed to the establishment of this programme, while it has committed itself to supporting the establishment of pilot sites for this initiative. In addition, the DEA has access to provincial networks of environmental educators and can assist with the initiative to ensure alignment and institutional support from the DoE and national systems of governance. Fundisa is a collaborative programme formed specifically to enhance transformative environmental learning through teacher education. It responds to the many pressing sustainable development issues facing the South African society (DEA, n.d.(b)).

## **5.10 The City of Tshwane local government**

The information discussed below provides evidence of the celebration of environmental days through partnership, particularly National Water Week.

### **5.10.1 Water and sanitation division letter**

LG wrote a letter dated 9 January 2013 to the GDoE requesting the release of ten learners and one educator to attend the celebration of the 2013 National Water Week on 20 March

2013 in the Akasia Hall (City of Tshwane, 2013). Learners are taught about the conservation of water during National Water Week. This includes fixing leaking taps and toilets as well as using glasses to drink water from taps. The invitation was extended to all principals of schools. Eleven out of the thirty-one invited schools were from the Tshwane South district, the area covered by this research study. The names of the primary schools that were invited were: Kgabo, Isaac More, JJ De Jong, Walton Jameson, Bathabile, Makgatho, Thoho-Ya-Ndou, Nellmapius, Vuka-U-zenzele, Emasangweni and Meetse A Bophelo.

### **5.10.2 Bontle ke Botho: Gauteng's green and clean campaign flyer**

Gauteng's green and clean campaign flyer was applicable for the years 2014–2015 (City of Tshwane, 2014). This campaign was discussed in Chapter 3, Section 3.15. The flyer outlines what BKB is, the campaign categories, the themes, the prize money, municipal and provincial categories, the procedures regarding how to enter and details of the coordinators in the municipalities and the GDARD.

### **5.11 Participant's behaviour**

The effectiveness of EE initiatives are measured by the participants' behaviour. Seven out of the nine visited schools had gardens which were established as result of EE programmes. In S2 the teachers used the garden that was established by the Pretoria National Botanical Garden as a teaching resource for Natural Sciences and Social Sciences. The teacher from S3 in photo 5.2. taught learners the history of medicine and the uses of some of the plants, for example artemisia afra (commonly known as "lengana") that can be used to cure flu or cough, and carpobrutus (commonly known as "cheaps") that can be used to heal wounds or cuts, that plants provide oxygen and also habitat to animals. One of the interviewees from S3 indicated that both the teachers and learners had started using these medicinal plants. However, this happened in two out of the seven schools that had gardens. S2 practised recycling plastic bottles to a point where learners enjoyed it and did not need any supervision. They collected bottles from their

homes to take to school. Recycling was sustained in one out of nine visited schools namely S9. The activity stopped due to lack of transport as explained in 5.2.2.

In five out of the nine schools visited, water was stored in containers. Learners used jugs to drink water and also used jugs or dishes to wash their hands after using the toilets and during lunch time. The Foundation Phase teachers used jugs to help learners wash their hands during lunch time. An attempt was made in schools to fix leaking taps and toilets. The water only wasted by the grades 6 to 12 learners, especially those who chose to bring packed lunches from home because they wanted to wash their lunch boxes using running water from the taps. The rest of the learners received their lunch from feeding schemes, where the plates were mostly washed in the kitchens and their behaviour towards water conservation could not be fully assessed.

On the other hand energy was saved by switching off the lights after school, however, old non-energy-efficiency globe are still used in all the visited school. As pre the findings of this study the initiative in this regard were focused only on switching lights off after school. There was no mention on whether the electronic appliances such computers used by both the teachers and learners were also switched off after school.

## **5.12 Summary**

Chapter 5 focused on the presentation and analysis of the data collected by means of observations, interviews and document analysis. The research summary, conclusions, recommendations, strength and limitations, guidelines and further research of this study are dealt with in chapter 6.

## CHAPTER 6

### RESEARCH SUMMARY, CONCLUSIONS, RECOMMENDATIONS, STRENGTHS, LIMITATIONS, GUIDELINES AND FURTHER RESEARCH

#### 6.1 Introduction

One of the aims of this research was to investigate how effective the implementation of EE initiatives were by selected government departments and the City of Tshwane municipality in South Africa. A further aim was to examine whether government officials were trained in EE and whether there was coordination of and effective collaboration between EE programmes or projects. The presentation and analysis of data were dealt with in Chapter 5. The topics and themes that the researcher wished the interviewees to discuss were developed by the researcher within the framework of a flexible question structure to enable both the researcher and the interviewees to answer the questions and develop unexpected themes and concepts. The themes discussed were guided by the main research question and sub-questions. Four unexpected themes and two new concepts emerged from the analysis of data, as they were grounded in the collected data.

The study was guided by the main research question, which read:

Are environmental education initiatives launched by the GDoE, DWA and DEA and the City of Tshwane local government effective?

The main research question was supported by the sub-questions, which were:

- What ensures the effectiveness of EE initiatives?
- What causes the failure or leads to the partial effectiveness of EE initiatives?
- What can government departments do to ensure the effectiveness of EE actions in schools?
- What kind of training can be provided to government departments officials to ensure the effectiveness of EE actions?
- What role can a team of officials from various government departments play to ensure the effectiveness of EE actions?

- How can EE actions be managed so that they are effective and have a lasting effect?
- How can partnerships and collaborations with other entities make EE initiatives more effective?

Chapter 6 presents an overview of the investigation regarding the achievement of the research’s aim and objectives. Almost all the supplementary questions had a direct link to the aims and objectives of the study, which were spelled out in Chapter 1. The data that were collected by means of three methods of data collection were triangulated during data analysis in an attempt to answer the questions of the study. This chapter also provides the synthesis of the research. Furthermore, the research summary, recommendations, research limitations, guidelines conclusions and areas for further research are discussed in this chapter.

## 6.2 Summary of key research findings

A summary of the research findings regarding the effective implementation of EE initiatives by selected government departments in South Africa is presented below. The summary of the key findings related to the objectives of the study, which were spelled out in Chapter 1, are shown in Table 6.1 below.

OBJECTIVES	RESPONSES
1 Determine what causes the failure or partial effectiveness of EE initiatives.	1.1 Improper training of officials, for example teachers and subject advisors, 1.2 Failure to integrate EE initiatives into the curriculum, 1.3 Haphazard implementation of EE initiatives, 1.4 Insufficient resources, 1.5 Lack of monitoring and support of EE initiatives, 1.6 The approach to celebrate special environmental days as events hinders the

	effective implementation of EE initiatives,
2 Determine the effectiveness of EE initiatives undertaken by government.	<p>2.1 Some schools, for example SA sustained gardens, SB sustained recycling activities, and SC sustained a medicinal plants garden,</p> <p>2.2 There is collaboration among the officials of the government departments,</p> <p>2.3 Environmental days are jointly observed by the government departments and</p> <p>2.4 Systems are in place to conserve water.</p>
3 Evaluate the effectiveness of collaborations and partnerships between government departments.	<p>3.1 Moderate collaboration exists among the officials of government departments and the City of Tshwane municipality and</p> <p>3.2 A high level of partnership is practised by the government departments.</p>
4 Determine whether government departments' officials who deal with EE issues are trained in EE.	4.1 Officials received training through tertiary education, WESSA and NGO workshops.
5 Determine factors that lead to the effectiveness of EE initiatives.	<p>5.1 Effective monitoring and evaluation of EE initiatives,</p> <p>5.2 Effective collaboration among the government departments' officials and between the government departments' officials and NGOs or partners,</p> <p>5.3 Proper and effective teacher and subject advisor training in EE,</p> <p>5.4 Effective coordination will ensure effective implementation,</p> <p>5.5 Meaningful EE activities integrated into the curriculum to avoid extra work</p>

	for teachers.
6 Determine the role a team of officials from various government departments can play to ensure effective EE actions.	6.1 Work together as a team with a common goal, 6.2 Plan and implement coordinated activities to avoid duplication and confusion as well as conflict among the government departments' officials and the schools.
7 Determine how EE actions can be managed so that they are effective and have lasting effects.	7.1 There should be effective collaboration and partnerships among government officials, 7.2 Partners should liaise with the curriculum implementers to discuss what and how activities should be engaged in, 7.3 Programmes or projects should be monitored during and after the partnership period has lapsed and 7.4 Appoint more than one champion in each school to coordinate the programme or project.

**Table 6.1: The key findings related to the objectives**

### **6.2.1 Findings from the site visits**

Observations were employed in this research because they are more objective than interviews and documents analysis (Hofstee, 2011:127; Smith, 2008:62). The findings among the selected schools regarding the availability of gardens, recycling activities, conservation of water and energy efficiency are discussed below.

### 6.2.2 Availability of gardens

Gardens are implemented as one of the EE activities. The information on gardens is summarised in Table 6.2 below.

School identity	No. of gardens	Type of garden
S2 , S5 , S8 and S9	None	Not applicable
S4, S7,	Two gardens, one in each school	Vegetable gardens
S3	One	Medicinal plants garden
S1 and S6	Two for each school	Both vegetable and medicinal gardens (S1 includes flowers)

**Table 6.2: Results on the availability of gardens**

The establishment of gardens form part of EE initiatives, as discussed in Chapter 2. The summary presented in Table 6.2 above reveals three types of gardens, namely vegetable, medicinal and flower gardens. These were established by the City of Tshwane municipality, the BMW Group of South Africa, the Pretoria National Botanical Garden and the R3.00 and R5.00 budget plant nursery. The vegetable gardens serve as supplements to the GDoE's feeding scheme, especially in township schools, while the medicinal plants gardens serve three purposes, namely to provide medicine, used as a teaching and learning resources and for decoration. It was noted that the effectiveness of these gardens and their sustainability are challenges faced by the schools. Teachers resort to the establishment of vegetable gardens because they do not understand how to implement EE. However, the gardens stop to exist once the programme is over.

### 6.2.3. Recycling activities

All the schools were once engaged in the recycling of either plastic bottles or cans. Learners became interested and brought plastic bottles to school. They stopped recycling due to challenges regarding the transportation of waste from schools to the recycling

sites. The main challenge faced by schools is the lack of finances to pay for the transportation of waste to the recycling sites. The City of Tshwane takes a long time to collect the generated waste while the partners from recycling sites will also delay. This challenge caused conflict between the schools and the communities. The uncollected garbage caused an unpleasant smell, which caused the communities to complain.

#### **6.2.4. Water conservation**

Issues pertaining to the conservation of water were discussed in Chapter 2. The results confirmed that schools had systems in place to conserve water. This included storing water in containers, fixing leaking taps and toilets, learners using jugs to drink water and using jugs or dishes to wash their hands after using the toilet and during lunch time, as well as the GDoE monitoring leakages. The water usage of senior learners during lunch time had a less negative impact, because the majority of learners received their lunch from the feeding scheme where their plates were mostly washed in the kitchen by the feeding scheme workers. It was noted that Balebogeng Primary School was able to sustain the solar heater, shade structure and JoJo tanks won during the *BKB* competition. The school sustained the initiatives because it was monitored and supported by a subject advisor for Social Sciences.

#### **6.2.5. Energy-efficiency strategies**

The issues surrounding energy efficiency were discussed in chapters 3 and 5. The results are in alignment with the discussion in chapter 3. The GDoE had put systems in place to ensure all the lights were switched off after hours. Computers were programmed so that they switch off automatically after being idle for some time. Although the results indicated that lights were switched off after school, non-energy-efficient globes were still used.

### **6.3 Interaction with participants**

The interviews assisted the researcher to obtain useful results because they afforded her an opportunity to probe the topics under discussion further.

#### **6.3.1 Subject allocations**

The allocation of subjects to advisors was based on subject specialisation. Each of them was allocated one subject. The research results of the interviews with Es in primary schools indicated that teachers were generally teaching five subjects, namely Natural Sciences, Natural Sciences and Technology, Social Sciences, Sepedi and Afrikaans Home Language, while the heads of department were responsible for seven subjects, namely Mathematics, Life Skills, Arts and Culture, Economic and Management Sciences, Life Orientation, English and Social Sciences.

The results from the secondary schools show that Es were generally teaching three subjects, namely Life Orientation, Social Sciences and Tourism, while the heads of department were responsible for five subjects, namely Mathematics, Physical Science, Life Sciences, Technology and Natural Sciences, providing a sufficient number of subjects to offer.

Subject advisors were allocated one subject and they were responsible for many schools in their districts. The allocation of one subject would enable them to monitor and support EE initiatives effectively in schools. However, this does not happen, because the research results showed that subject advisors were not trained in EE. If more than one subject is allocated to teachers, this will provide them with an opportunity to integrate similar environmental content from the allocated subjects. It was noticed that the practical situation showed ineffective implementation due to the lack of proper teacher training, resources and methodology.

### 6.3.2 Knowledge about the concept ‘environmental education’

The officials from three selected departments, namely the GDoE, DWA and DEA, and the City of Tshwane municipality understand the concept of ‘environmental education’ differently in relation to what they practise in their work environments.

With regard to the knowledge about the concept ‘environmental education’, GD1 officials relate the concept to providing awareness education and teaching learners how to take care of the environment through various activities. These activities were greening the school yard by planting trees to stop contributing towards global warming; planting vegetables, medicinal plants and flowers in schools; looking after them and explaining how it contributed to our daily lives; and sensitising people about environmental challenges so that they can have a positive attitude to the environment or nature. Other activities were teaching learners and communities about environmental health, problems and skills to address these challenges and the commemoration of environmental days such as Earth and Wetlands days as well as their conservation. In addition, they engaged in making compost from vegetable peels, stopping pollution by picking-up-litter activities, learning about alien plants as weeds, and water conservation and recycling through programmes such as *Baswa le Meetse* and *BKB*.

A GD2 official declared:

*An integrated education about the environment in terms of nature specifically water, how water interlinks with our daily lives at home, businesses and in industries, since water is a resource that needs to be taken care of, and to educate learners and communities on how our daily activities impact the environment and how to go about remedying the impacts as well as water use efficiency.*

A GD3 official explained:

*The concept refers to education that builds capacity or competencies for sustainable development, an action-oriented education geared towards*

*balancing the social, economic and ecological or biophysical considerations or needs.*

To an LG official, the concept ‘environmental education’ refers to:

*an integral part of sustainable development and an important part of the country’s understanding of the environmental impact and how do they relate to their actions.*

The officials understand this concept in terms of the focus of EE implementation in their departments and municipality; however, the institutions have a common goal that relates to education about the environment and sustainable development.

### **6.3.3 Participants’ revelation about the concept ‘environmental education’**

The participants knew about the concept of ‘environmental education’ through various means. The selected government departments, especially the DWA, used the media to ensure that almost every person was reached by the news of the *Baswa le Meetse* programme. In addition, *Groen Sebenza*’s environmental vacancies were also advertised through the media. The CAPS has through subjects content exposed most teachers and subject advisors to the concept. The integration of environmental content into the subjects is evident in the subject policy documents. The knowledge of the subject advisors for Social Sciences about the concept was extended by joining environmental education forums such as GEEF. Both the teachers and the subject advisors celebrated environment days, which provided them with an opportunity to expand their knowledge of the concept. It was interesting to note that some officials learnt about the concept during their studies at tertiary level.

The role of NGOs such as *Eco-schools*, EE centres and environmental centres was evident, working in close cooperation with the officials from the selected government departments. Furthermore, UNESCO programmes and conferences played a role in exposing officials to the concept, especially the DEA officials. The participants displayed

some knowledge and understanding of environmental activities as well as engagement in various activities. This is an indication of the interest they had in EE initiatives. Following the participants' responses in Chapter 5, it was clear that officials from the GDoE were aware of the integration of EE into the subjects; however, it was noted by some that it would be effective if the GDoE were to make it an independent subject. The lack of monitoring of the initiatives by the government departments' officials is viewed as one of the factors that contribute to the ineffectiveness of EE initiatives by the South African government.

#### **6.3.4 The level of effectiveness of EE initiatives undertaken by the South African government**

Different views emerged on the level of effectiveness of EE initiatives undertaken by government. One was that EE initiatives were effective because schools had school gardens and used recycled material to make pot plants and that there was collaboration among the stakeholders during the celebration of special days such as Arbour Day. Contrasting views also emerged: first was the fact that EE was not a subject or compulsory subject and second so it was not taken serious, the lack of proper teacher training in EE caused the ineffectiveness or low level of government implementation of EE programmes. It has been noted that the lack of support and/or monitoring after the partners left led to the lack of sustainability of EE initiatives.

It was noted that the lack of integration of the projects and programmes activities with the relevant content taught in each grade and term caused some problems, because the initiatives became events that took place and were celebrated only for that particular day. Furthermore, teachers were not taught to integrate environmental content during their training. Therefore, the EE initiatives were separate from what they did in the classroom, hence these initiatives became add-ons.

### **6.3.5 Factors that led to the partial or total failure of implementation of EE initiatives**

There are several factors that led to the failure and/or partial implementation of EE initiatives. One factor was the lack of proper training of teachers and subject advisors on how to integrate EE initiatives in the curriculum, which led to projects and programmes being implemented haphazardly and therefore not succeeding. Other factors included the lack of resources, the non-involvement of subject advisors to monitor EE initiatives and support schools on a regular basis, the lack of monitoring and support after the project or programme period lapsed, failure by teachers to integrate EE into their subjects despite the fact that it formed part of the subject content and the lack of workshops to empower teachers on how to integrate environmental content to ensure its effective implementation. Other factors included that teachers who coordinated the project disengaged once the people who started the project left, teachers lacked time to sustain EE initiatives as it is viewed as an add-on, teachers do not make it practical and interesting for learners and teach it like theory content, environmental days are celebrated only as events, the collaboration among stakeholder is ineffective or lacking in general, and EE is perceived to pertain to certain subjects such as Life Orientation, Natural Sciences and Technology, Social Sciences, Technology and Geography, while CAPS demanded a lot of time from educators.

The results revealed multiple factors which need effective coordination to ensure effective collaboration that will lead to effective implementation of environmental education initiatives as indicated in the theoretical framework of this study.

### **6.3.6 Environmental education programmes and/or projects implemented by government departments**

It was interesting to note that various projects/programmes are implemented by government departments, the City of Tshwane municipality and NGOs. These include the *recycling* of plastic bottles and/or cans; the *BKB* programme; greening through *vegetable, medicinal, indigenous and flower gardens*; *vegetable seedlings donation projects* by the R3.00 and R5.00 budget plant nursery; *Baswa le Meetse* and *Aqua Enduro*; The BMW

Group *seeds programme*; the *Fundisa for Change programme*; *Groen Sebenza*; and planting *medicinal plants* donated by the Pretoria National Botanical Garden. It is evident that government departments are taking certain actions to address environmental problems through different initiatives. On the other hand, the sustainability of these projects/programmes is still a challenge.

### **6.3.7 Coordination teams**

Systems in terms of coordination are not in place to ensure the effective implementation of EE initiatives in schools. None of the stakeholders from the GDoE, DWA and DEA, NGOs and partners had coordination teams. The establishment of a coordination team would contribute positively towards the effective implementation of EE initiatives because the coordination teams would organise meetings on dates that allowed maximum representation or participation by government departments' officials and the City of Tshwane municipality officials and all participating parties. Efforts to coordinate EE initiatives by the government department officials and the City of Tshwane municipality officials met with challenges, as discussed in Chapter 3.

### **6.3.8 The target groups regarding the implementation of EE programmes and/or projects**

The initiatives were uniformly spread from the Intermediate Phase to the FET band to provide learners with environmental knowledge that formed the basis of EE. The following target groups were noticed: Grade 6 learners for the *Baswa le Meetse*, Grade 11 learners who were taking Mathematics and Physical Science for *Aqua Enduro*, while the *Youth Water Price* targets the Senior Phase Grade 9 and FET band (grades 10 to 12) learners. The learners were supposed to complete a project, for example a water purification model that should be functional when tested. The Youth Summit targeted all learners who participated in various competitions from grade 6 to 12. EE programmes and/or projects cut across the Human Capital Development pipeline, and pertain to schools and communities, universities, TVET colleges, workplaces/ labour market, the

sector education and training authorities, NGOs, ward councillors, community structures, educators, employees and community-development workers.

It was noted that activities were hands-on, for example water purification. It is important for our learners to acquire such skills, as water is a scarce but essential resource, while South Africa has problems with regard to water availability and supply. The most interesting part is that learners were supposed to complete a functional model. This means the learners had to be skilled and apply the skills in life practically.

### **6.3.9 The level of fairness of EE project competitions**

It was evident that EE competitions such as the *BKB* and *Baswa le Meetse* as well as *Aqua Enduro* were conducted in schools. The competitions involved showcasing of the work done regarding a project that would be presented through a report with some form of evidence such as photos or written essays that were assessed by appointed judges, hence, the availability of portfolios that were analysed in Chapter 5.

The majority of the participants were never involved in EE project competitions. Only six out of 24 interviewees were involved and that made it difficult for this research to reach a conclusion regarding whether the competitions were fair or not. However, a question arises as to why only a few people were involved in EE competitions. This might be that people are less interested or there is no fairness in the competitions.

### **6.3.10 Ways of ensuring the effective implementation of EE programmes and projects**

There were various strategies employed to ensure the effective implementation of EE programmes and projects, such as the mobilisation conducted through the media during the initial stage to ensure that everyone was reached concerning the implementation of EE programmes and/or projects. Pre- and post-workshops were conducted to ensure the sustainability of EE programmes and/or projects, guidelines were provided to schools and support was also given to those who sought it. There was sound project management

capacity building and provision of resources, monitoring and evaluation, including conducting a needs analysis prior to developing any programme for the identified target group.

Although the media were used to ensure that almost everyone was reached with information on the *Baswa le Meetse* competitions, the question arises as to whether the use of media to announce the information about the competition was effective or whether people were just not interested.

The effective application of these strategies needs further investigation, as there is a lack of resources, and due to the issues discussed in Section 6.3.5 above, which showed that EE initiatives faced challenges regarding the sustainability of projects and/or programmes.

## **6.4 Findings from the document analysis**

The summary of written materials relevant to the study was analysed in Chapter 5, namely forms, portfolios, CAPS, the *Youth Summit on Water and Climate Change* outline document, attendance registers, programmes, *Fundisa for Change*, *Groen Sebenza*, environmental centre and EE centre programmes, an introduction workbook for interns in the environment and biodiversity sector, the *BKB* flyer and other information that emerged from the data.

### **6.4.1 Forms**

Efforts were made to ensure the smooth running of the EE competitions. This was done by making forms available such as entry forms for funding and entering competitions such as the *BKB*, *Baswa le Meetse* and *Aqua Enduro* to those who were interested in entering the competitions. The provision of guideline forms enabled the proper registration and management of time so that the completed forms were not returned for correction.

### **6.4.2 Attendance register**

The research results indicated the availability of an attendance register signed by the teachers during a meeting organised by the subject advisor from the Gauteng Department of Education in the Tshwane South district. Thirty- two teachers who attended the meeting received the entry forms that were explained to them and they were told to complete and submit them to the Department of Water Affairs by the end of December 2014 for entry in 2015. This is an indication of the collaboration between the officials from the Gauteng Department of Education and the Department of Water Affairs.

### **6.4.3 Portfolios**

The results indicated the availability of portfolios in two different schools for different programmes, namely *BKB* and the *Eco-Schools* programme. These portfolios contained evidence of EE activities for the programmes, as discussed below.

#### **6.4.3.1 *BKB* portfolios**

The portfolios contained photographs showing the school before and after the project was implemented as well as of staff members from the school, learners and officials from partnerships, the minutes of meetings and the descriptions of activities that were conducted.

#### **6.4.3.2 *Eco-Schools* portfolios**

The portfolios contained information that relate to an owls' nest, the conservation of water and electricity, engagement with the environment, the involvement of parents and the community, the establishment of clubs and recycling activities.

#### **6.4.3.3 Eco-Schools platinum flag**

The results indicated the availability of an Eco-Schools platinum flag won by a school at the time when it was affiliated with the *Eco-Schools* programme. The Eco-Schools flag was first discussed in Chapter 3, Section 3.10.1, in which it was explained that schools that perform well in the programme are awarded the platinum flag.

#### **6.4.3.4 The Eco-Schools audit and review**

It was noted that two audits and reviews were conducted between 1 March 2012 and 22 October 2012. Five themes that needed attention were identified and implemented. These included the resources used, local and global issues, nature and biodiversity, healthy living, and community and heritage, which were implemented through the lesson plans. The green flag was a testimony that the school addressed the environmental problems identified during the audit.

#### **6.4.4 The South African curriculum**

Systems are in place to enable the teaching and learning of issues regarding the environment. It has been noticed that both the principle and content of CAPS (grades R-12) required teaching and learning about the environment in schools. All teachers had the mandate to teach contents relating to the environment as spelled out in the CAPS documents for different subjects. The integration of environmental content into the curriculum is viewed as an achievement, because education is considered as the vehicle to the implementation of EE both informal and even in a formal manner. This is because the curriculum complies with the Constitution of the Republic of South Africa, as discussed in Chapter 1.

The question, however, is how effective the integration of EE is in the teaching and learning of all subjects. The results indicated challenges such as lack of proper teacher and subject advisor training, resources, and monitoring and support, which hampered the effective implementation of EE initiatives. The results confirm educators' expression

about the implementation of EE, which was highlighted in Chapter 3. Educators further showed their frustration caused by the introduction of many concepts even before they can understand the concepts that were first introduced. It was noted that teachers lacked the capacity and competency to implement EE initiatives effectively, which was brought about by poor teacher training. The results of this study revealed that educators thought the initiatives would be effective if EE was considered a subject, which confirmed that they did not implement the EE initiatives effectively. However, this study advocates that EE initiatives would be effective if there is effective coordination and collaboration.

### **6.5 Programme**

A programme of celebrations of Midrand Primary School, which won the *Baswa le Meetse* competition, was viewed, during which the DWA handed over the media classroom to the school. The school is situated in the Gauteng province. The *Baswa le Meetse* was a collaborative effort that was attended by officials of the GDoE, DWA, Arts and Culture, and the *MTN Foundation* – again, a confirmation of collaboration on celebration days. It is important for all stakeholders to monitor and support the school to ensure the effective use and sustainability of the media classroom by the school.

### **6.6 Fundisa for Change**

The research results highlight the practice of partnerships in South Africa in which policy and implementation are considered. *Fundisa for Change*, for example, is a partnership programme aimed at enhancing transformative environmental learning through teacher education, which confirms that partnerships do take place.

The programme responds to many pressing sustainable development issues facing South African society (DEA, n.d.(b)). Partners in the programme include, among others, the DEA, the GDoE, the DWA, *Eco-Schools*, WESSA, Rhodes University, the South African Council for Educators, *BMW seed programme*, the University of South Africa and the Lewis Foundation. The DEA provides leadership with regard to all environmental skills plans and has contributed to the establishment of the *Fundisa for Change programme*. The department further has access to provincial networks of environmental educators and

has the capacity to assist the initiative to ensure alignment and institutional support from the DoE and national systems of governance. The DEA has committed to supporting the roll-out of pilot sites for this initiative and provides additional financial support to the *Fundisa for Change* programme.

The findings of this study showed a partnership between WESSA, the GDoE, the DWA, and EE centres and environmental centres in the implementation of EE initiatives. Although the research findings revealed that partnerships exist between South Africa and other countries like Germany on *energy efficiency* and other partners like the Eco-Schools programme, the challenge of effective implementation of EE initiatives and their sustainability was noticed. The partnerships are highly superfluous, faced with the challenge of sustainability of EE initiatives that are linked to the lack of time and the overload of work on the side of teachers, who then regard EE initiatives as an add-on. In addition, the question regarding the effectiveness of qualitative EE development programmes still remains. Another evidence of partnerships revealed by the research findings is discussed in below.

### **6.7 Groen Sebenza jobs fund partnership programme**

SANBI entered into a partnership with 32 environment/biodiversity organisations. The purpose of *Groen Sebenza* is skills development and creating a pilot plan for job creation. The programme is a jobs fund partnership project (consisting of organisations from all tiers of government, NGOs and the private sector). Its purpose is to develop priority skills in the biodiversity sector to create sustainable job opportunities for unemployed graduates and those with Grade 12 certificates. The development of skills in the environment field might contribute positively to the effective implementation and sustainability of EE initiatives. However, the partnership is too big, which might hamper the effective implementation of the programme because the results of this study revealed challenges even with small partnerships, such as *BKB*.

## **6.8 Environmental centre and environmental education centre programmes**

Issues regarding the partnership of environmental centres and EE centres with the GDoE in implementing EE initiatives were discussed in Chapter 3. The results indicated the availability of programmes for two environmental centres (the Delta Environmental Centre and the Walter Sisulu Environmental Centre) and one environmental education centre (Mogale's Gate Environmental Education Centre), which were provided to the subject advisor for Social Sciences at the Tshwane South district to facilitate effective joint planning of EE programmes and their implementation. The programmes outline aspects of the activities to be implemented during each term for Foundation, Intermediate, Senior and FET band subjects and for the celebration of environmental days.

The findings provided evidence regarding the collaboration between the environmental centres and EE centres with the GDoE in implementing EE initiatives. The activities offered by the centres are aligned with the content of specific subjects of CAPS. This provided a good opportunity for the integration of environmental content with the activities for each subject and creates meaningful learning. At the time of the study, collaboration between the GDoE and the centres was evident, however, the effectiveness of activities offered by the centres to learners and how teachers incorporate the activities into assessment leave much to be desired.

## **6.9 Careers and qualifications**

### **6.9.1 Induction workbook for interns in the environment and biodiversity sector**

The government departments of South Africa are indeed engaged in EE initiatives to address environmental challenges. It was interesting to notice that the purpose of this workbook was to provide basic information regarding interns with the aim of bridging the gap between the interns' academic training (through practical experience) and the workplace (Raven & Rosenberg, n.d:vii.). The aim was to assist interns and professionals in terms of working for a better environment and a better life for all. The results indicated that the ESSP of 2010 and the HCDS confirmed that students pursued environmental studies but did not necessarily develop a clear picture of the world of work. The

workbook focuses on the biodiversity sector while it also has relevance to the broader environmental sector. The action by the department is essential, as the application of theory learnt from school is essential to ensure the effectiveness of EE initiatives.

### **6.9.2 Expanding access to career information services and working for a greener world**

The issue of careers in the DEA was discussed in Chapter 1, Section 1.7.1.2. In the case of careers, the research findings indicated that the demand for career guidance exceeded the supply, resulting in many people not being able to access it (DEA, n.d.(a)). Employed people, tertiary students, mothers with young children, women returning to work, older adults, people with disabilities, remote communities and a range of disadvantaged groups are among those whose needs are not adequately catered for. There is a need for supplementary public provision of career guidance services by private, enterprise-based and community-based entities. The challenge in terms of a policy is to find ways of stimulating involvement through partnerships and outsourcing (DEA, n.d.(a)). The research findings with regard to participants' training in EE pointed to the lack of training, which hampered effective implementation of EE initiatives. Information about careers, especially in the environment sector, needs to be given attention to enable people to implement EE initiatives.

### **6.9.3 Short course**

With regard to the short courses offered by the Delta Environmental Centre, both the teachers and the subject advisors benefited from such training. The material provided and activities conducted were integrated with CAPS.

### **6.9.4 The Youth Summit on Water and Climate Change outline document**

The programme's intention is to address water and environmental issues as well as careers. The document outlines the key objective of the summit, its duration and the

themes it addresses. The programmes and activities in which learners engaged during the summit are clearly spelled out. These were excursions, youth debates, clinics (experts in water and climate change providing lectures on topical issues), exhibitions and African participation.

The fact that the Deputy Minister of Water and Environmental Affairs hosted the ceremony to acknowledge the excellence of the teaching and learning process on to issues pertaining to water and climate change showed the seriousness on the side of the government of South Africa. The learners who competed in various projects of the department such as *Baswa le Meetse* and the *youth debate* received prizes and certificates of excellence from the minister at the ceremony. The summit is important, as it addresses current environmental issues such as water scarcity.

#### **6.9.5 Training received by the participants in EE**

Training in EE is important, as it provides knowledge and skills that facilitate effective implementation. It has been noticed that some participants had tertiary training in EE. An NGO such as WESSA played a role with regard to the training of government officials, particularly teachers. The provision of EE training through workshops was also evident, which is important, as it forms part of teachers' professional development that could address the challenges regarding the effective implementation of EE initiatives.

#### **6.9.6 Participants' qualifications in EE**

It is interesting to note that the participants' qualifications ranged from having passed a module to having a certificate, national diploma, first degree or honours' degree in the field of environment, engineering and science. The results showed that few participants were qualified in EE. This might be one of the contributing factors to the partial implementation of EE. The finding is linked to the initiative that was taken by the DEA to provide career information in the environment sector.

## **6.10 Water and sanitation division**

A letter written by the City of Tshwane to the GDoE requested the release of ten learners and one educator to attend a celebration of National Water Week on 20 March 2013 at the Akasia Hall. Eleven out of thirty-one invited schools came from the Tshwane South district, the area covered by the current study. Collaboration between the City of Tshwane municipality and the GDoE is therefore evident.

## **6.11 Bontle ke Botho: Gauteng's green and clean campaign flyer**

The results revealed the availability of 2014 to 2015 flyer on "Heightening environmental awareness and sustainable environmental actions through partnership". In addition, the flyer outlines what *BKB* is, the campaign categories, themes, prize money, municipal and provincial categories and prizes, the procedure on how to enter and the details of the coordinators in the municipalities and the GDARD. This campaign was discussed in Chapter 3, Section 3.15. The information that emerged from the data is discussed below.

## **6.12 Other information that emerged from the data**

The emergence of other information from the data that were highlighted in Chapter 4 was evident. Qualitative research is associated with emerging information or aspects. The items discussed below emerged from the collected data.

### **6.12.1 Printed items**

The evidence of printed items that relate to the implementation of EE initiatives was revealed by the findings. The printed items were important since they were relevant to the study.

### **6.12.2 Cushion**

The results indicated the availability of a cushion at S1 which had won the *BKB* competition for having the best vegetable, flower and medicinal gardens. Communication about the EE programme, *BKB*, was extended to the use of printed items. The intention was to spread the message effectively and to encourage people to join the programme.

### **6.12.3 T-shirts**

The results indicated the availability of T-shirts that bore the logos of partners who were behind the establishment of a vegetable garden in one of the nine schools S7 with which the researcher interacted. The intention of distributing the T-shirts was to extend the message about the environment to communities around the school.

### **6.12.4 Photographs**

The photographs depicted the people who attended World Environment Day, the garden tools and seedlings as well as food parcels supplied by the City of Tshwane. The availability of rubbish bins for different types of waste bearing the City of Tshwane logo was also revealed by the results from photographs. A garden was established on 5 June 2013 at S7 with the help of the City of Tshwane. The researcher formed part of those who attended the occasion.

### **6.12.5 Business card**

The role of NGOs in implementing EE initiatives was evident, as the findings indicated a business card that was accessed from S4. It was noticed that the school was in partnership with the R3.00 and R5.00 budget plant nursery. The business card was filed for the purpose of keeping the details of the sponsor, as this was the only sponsor the school had.

### **6.12.6 Clubs and owls' nest**

The two concepts of 'clubs' and 'owls' nest' emerged from the data that were collected from a school that was awarded the *Eco-Schools* green flag. *Eco-Schools* clubs were established to ensure the effective implementation of the *Eco-Schools* and the sustainability of the programme. In addition, the existence of an owls' nest in the school yard occupied by two owls that found a shelter, which was built by the learners, is a good signal of sustainability of the *Eco-Schools* programme.

## **6.13 Conclusion and recommendations**

The findings of this study showed that the implementation of EE initiatives by the selected government departments has some challenges, which prompted the researcher to provide some guidelines for improving the implementation of EE initiatives. The conclusion, recommendations, strengths and limitations, guidelines and opportunities for further research are summarised below.

### **6.13.1 Conclusion**

The programmes and projects that are implemented in schools addressed practical environmental issues in South Africa. The government departments, namely the GDoE, DWA and DEA, made an effort to address environment problems at national levels. Partnerships were entered into with NGOs and collaboration occurred among the government departments and the City of Tshwane municipality. However, there were some problems that contributed towards the partial or complete failure of the initiatives by government. The sustainability of programmes/projects was a challenge, because teachers regarded these programmes or projects as additional burdens on top of their normal workloads, together with the lack of proper teacher training and the unavailability of resources, post-monitoring and support programmes or projects, the lack of integration of EE initiatives with CAPS and ineffective collaboration and coordination.

The selected case studies at international level namely; Mexico, Namibia, Brazil and Canada shows that all the countries came up with some initiatives to implement EE, South Africa is no exception. Legislative frameworks were developed while projects were implemented. In all the countries both successes and weaknesses were experienced.

### **Successes**

In Mexico the Ministry of Education published the materials and distributed them to rural libraries. University faculty members had volunteered their time to teach and over 200 teachers had taken the course, while more were on the waiting list. Six course manuals had been published and three others were in a state of development, providing evidence of a changing environment in the community. In addition, more latrines had been built and more stoves were used as a result of the course.

The South African Constitution addresses the issues of the environment namely; that everyone has the right to a healthy environment. In addition, the curriculum infuses environmental content in every subject while currently EE is also offered in institutions of higher learning as a module. In addition, there are environmental and EE centres as well as Botanical gardens that offer EE activities and or courses. Namibia has a draft EE policy document developed by the ministry of Education and Environment and Tourism with the support of NEEN. Enviroteach project was also implemented in Namibia. Brazil also developed some environmental legislative while the Sao Carlos Ecological Pole project was initiated. Like South Africa, Canada infused EE in the curriculum.

### **Weaknesses**

In Mexico teachers with little background in environmental resources tend to avoid the Natural Sciences component of the primary curriculum, while environmental topics presented in the curriculum are often irrelevant for rural communities. In South Africa EE is perceived to be relevant to specific subject such as Physical Science, Geography, Natural Sciences, Natural Sciences and Technology and Social Sciences. Teachers for the mentioned subjects have not shown considerable impact regarding effective implementation of EE. The lack of resources and ineffective teacher training is another challenge in South Africa. Some teachers in Mexico attended the course for an increase in their salaries and free materials, the situation compares positively with South Africa. On

the other hand training offered in institutions of higher learning produce teachers who face similar challenges when compared with those who were not trained in EE in South Africa. In Namibia the lack of EE resources and EE centres are alleged to be the factors that led to ineffective implementation of EE and the lack of sustainability of enviroteach project. The lack of public participation in the decision-making process and the application of laws are seen as stumbling blocks to the effective implementation of environmental initiatives in Brazil while South Africa's Constitution, the right to a healthy environment for everyone is not practical. In Canada there was no collaboration between teachers and environmental education providers to create curricula opportunities that build on experiential learning and integrated school experiences, South Africa has collaboration that needs to be strengthened.

Following the discussion above and in 5.11 the study concludes that the initiatives launched by the Gauteng DoE, DWA and DEA and the city of Tshwane local government are partially effective.

### **6.13.2 Recommendations**

Recommendations are provided to improve the implementation of EE initiatives by the government departments of South Africa.

- There should be monitoring, support and evaluation of EE projects and programmes after the partners have left to ensure the sustainability of the projects and programmes. This will enable the partners, subject advisors and teachers to identify challenges that might arise and jointly address them.
- To avoid the failure or partial implementation of EE projects and programmes, the officials from the government departments and partners should plan and implement EE projects and programmes in conjunction with one another.
- There should be proper and effective training of EE implementers (teachers, subject advisors and all other stakeholders). A diagnostic analysis should be done to identify areas where training is needed and the period needed for such training.

- Teacher training institutions (universities in South Africa) should ensure effective infusion of environment content in all subjects.
- A coordination team for environmental programmes and projects consisting of members of the various departments should be introduced to ensure the effective implementation of EE projects and programmes.
- Involvement of the parents and community is crucial for the effective implementation of EE. The government departments should plan together for the implementation of environmental programmes and projects.
- Involvement of the principals and all teachers and not only one teacher is essential when implementing EE projects and programmes in schools to ensure the sustainability of the initiatives in many schools. The involvement of one teacher can be a problem if he or she leaves the school because of promotion or resignation, which is common in many schools.
- EE activities should be aligned with the curriculum to avoid activities to become add-ons to teachers. EE partners should work closely with the curriculum unit to ensure that the activities are relevant to the grade and term as well as conduct meaningful assessment that speak to the CAPS programme of assessment.
- Effective collaboration is a vital tool and should be encouraged. If well managed, it can afford all stakeholders the opportunity to share knowledge, skills and strategies towards effective EE initiatives. The curriculum developers and implementers should collaborate and constantly assist teachers to effectively manage and sustain EE initiatives.
- The curriculum implementers should form sustainable forums in which they will discuss the successes and weaknesses of strategies employed to implement EE initiatives in their particular subjects. This will enable them to share good practice and effectively address the challenges. In addition, the curriculum implementers

will have an opportunity to discuss policy and ways of integrating environmental activities with the curriculum, which the study found to be a challenge.

- The districts should keep a database of programmes and projects embarked on, especially reports on the successes and weaknesses. This will assist both the partners and the GDoE to assess the status quo of the EE initiatives post the partnership and to be in a position to assist teachers.
- Effective partnership amongst the government departments, NGOs, municipalities and private companies is essential in addressing local and global environmental issues. Partnerships are important because addressing environmental issues should be a joint effort locally and globally.

#### **6.14 Strengths and limitations**

Researchers are governed by research ethics, which this study observed. The researcher was allowed to interview the teachers during break time only, which was a constraint as the interviews had to be conducted in less than 30 to 45 minutes, which are the time frames allocated for breaks in many schools. The researcher was a subject advisor in the GDoE and had interacted with a number of partners regarding EE initiatives for quite some time, and therefore understood the participants' responses well. One out of the ten schools could not participate in this study. The information missed might have added value to the study in question. The data collected from the nine schools showed some similarities, which means the schools covered provided information that was sufficient for this study to answer the research questions raised in Chapter 1.

#### **6.15 Guidelines for positive contributions to the effective implementation of EE projects and/or programmes**

The following guidelines are provided by the study for the effective implementation of EE projects and/or programmes:

- Establishment of government EE coordinating teams at national, provincial and district levels.
- Establishment of EE units by the DoE at national, provincial and district level.
- Appointment of environmentally qualified coordinators at national and provincial levels to ensure the implementation of environmental content spelled out in CAPS and the effective implementation of projects and programmes.
- Appointment of environmentally qualified subject advisors at district level to ensure the integration of environment content into everyday teaching and learning, assessment and to monitor and support schools.

#### **6.16 Guidelines for government officials from various departments for joint planning and the implementation of environmental education initiatives**

A team of officials should be established from the various departments and local governments who will plan and implement EE projects and/or programmes together. This will ensure the attendance of meetings and environmental activities by all officials and their continual representation. Systems should be in place to set procedures that should be followed to monitor and support schools.

#### **6.17 Guidelines for effective partnerships**

If the partners worked closely with districts, this could minimise if not avoid conflict among partners, subject advisors and teachers. It could benefit the DoE if schools were to address environmental content as per CAPS, while partners would have effective and sustainable programmes and/or projects.

## **6.18 Further research**

The effective application of EE strategies by government departments to ensure sustainability of EE initiatives needs further research. The environmental education initiatives implemented in communities by the city of Tshwane municipality can also be further researched.

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# APPENDICES

## APPENDIX A: APPROVAL LETTER



### GAUTENG PROVINCE

Department: Education  
REPUBLIC OF SOUTH AFRICA

For administrative use:  
Reference no. D2013/211

#### GDE RESEARCH APPROVAL LETTER

Date:	19 October 2012
Validity of Research Approval:	4 February 2013 to 27 September 2013
Name of Researcher:	Makokotlela M.V.
Address of Researcher:	P.O. Box 39756 Moreleta Park 0044
Telephone Number:	012 401 6357 / 083 758 7759
Fax Number:	012 401 6358
Email address:	matlala.makokolela@gauteng.gov.za
Research Topic:	Determining the effectiveness of environmental education actions of selected government departments in South Africa
Number and type of schools:	SIX Primary and FOUR Secondary Schools and FIVE other Institutions
Districts/HO	Tshwane South

1. The District/Head Office Senior Manager/s concerned must be presented with a copy of this letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.
2. The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.
3. A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.
4. A letter / document that outlines the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.
5. The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.
6. Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.
7. Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year.
8. Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.
9. It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.
10. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.
11. The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.
12. On completion of the study the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.
13. The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.
14. Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

Dr David Makhado

Director: Knowledge Management and Research

DATE: 2012/10/19

Making education a societal priority

Office of the Director: Knowledge Management and Research  
9<sup>th</sup> Floor, 111 Commissioner Street, Johannesburg, 2001  
P.O. Box 7710, Johannesburg, 2000 Tel: (011) 355 0508  
Email: David.Makhado@gauteng.gov.za  
Website: www.education.gpg.gov.za

## **APPENDIX B**

### **OBSERVATION CHECLIST**

#### **1. Availability of a garden/s**

- Vegetable garden
- Medicinal garden

#### **2. Recycling activities**

- Waste storage
- Type of waste
- Plastic waste
- Tins
- Paper

#### **3. Water conservation**

- Leaking taps
- Leaking toilets
- Did learners and teachers use their hands to drink water from the tap/s?
- Did learners and teachers wash their hands using tap water?
- Did they wash their lunchboxes using tap water?

#### **4. Energy efficiency strategies**

- Type of globes used
- Solar water heater

## **APPENDIX C: INTERVIEW QUESTIONS**

### **DATA COLLECTION TOOLS: IN-DEPTH ONE-ON-ONE INTERVIEW QUESTIONS: SEMI-STRUCTURED QUESTIONS**

#### **i Department of Education: Facilitators/Teachers**

1 For which subject/s are you responsible for?

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2 What do you understand about the concept environmental education?

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3 How did you find out about the concept environmental education?

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4 How effective is EE initiatives undertaken by the South African Government?

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5 Which factors can/do lead to the failure or the partial effectiveness of EE initiatives?

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6 What EE programmes and/or projects you know are implemented in schools?

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7 How effective are the environmental education partnership projects and programmes in schools?

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8 How effective is collaboration between the various Government Department officials in implementing environmental education projects and/or programmes?

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9 Which coordination team is in place to ensure effective implementation of environmental education in schools?

National coordination team	Provincial coordination team	District coordination team	None
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10 What kind of training did you receive in environmental education? Tick what is applicable to you.

Work shop	In-service training	Tertiary training
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Other, specify \_\_\_\_\_

11 What qualification/s do you have in environmental education? Tick what is applicable to you.

Certificate	National Diploma	Degree	Masters	Doctoral
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Other, specify \_\_\_\_\_

12 How do you rate the fairness of the environmental education projects competitions?

Not fair	Less fair	Very fair	Never been involved
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## DATA COLLECTION TOOLS: QUESTIONS

### ii Department of Water Affairs: Aqua-Enduro/Baswa le Meetse

1 What do you understand about the concept environmental education?

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2 How did you find out about the concept environmental education?

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3 Which environmental education programmes and/or projects do you implement in schools?

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4 Who is your target group in schools with regard to environmental education programmes and/or projects?

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5 What training did you receive in environmental education? Tick what is applicable to you.

Work shop	In-service training	Tertiary training
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Other, specify \_\_\_\_\_

6 What qualification/s do you have in environmental education? Tick what is applicable to you.

Certificate	National Diploma	Degree	Masters	Doctoral
-------------	------------------	--------	---------	----------

Other,  
specify \_\_\_\_\_

7 How do you ensure the effective implementation of environmental education programmes and projects for your target group?

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8 How effective is the collaboration between the various Government Department officials regarding the implementation of environmental programmes and/or projects?

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9 How effective are the environmental education partnerships regarding projects and/or programmes in schools?

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10 What coordination systems are in place to ensure effective implementation of environmental programmes in schools?

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## DATA COLLECTION TOOLS: QUESTIONS

### iii Department of Environmental Affairs: Officials

1 What do you understand about the concept environmental education?

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2 How did you find out about the concept environmental education?

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3 What environmental education programmes and/or projects do you implement?

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4 Who is your target group with regard to the environmental education programmes and/or projects?

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5 What training did you receive in environmental education? Tick what is applicable to you.

Work shop	In-service training	Tertiary training
-----------	---------------------	-------------------

Other, specify \_\_\_\_\_

6 What qualification do you have in environmental education? Tick what is applicable to you.

Certificate	National Diploma	Degree	Masters	Doctoral
-------------	------------------	--------	---------	----------

Other,  
specify \_\_\_\_\_

7 How do you ensure effective implementation of environmental education programmes and projects for your target group?

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8 How effective is collaboration between the various government department officials with regard to the implementation of environmental education programmes and/or projects?

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9 How effective are the environmental education partnerships regarding projects and/or programmes pertaining to your target group?

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10 What coordination systems are in place to ensure the effective implementation of environmental education programmes for your target group?

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**DATA COLLECTION TOOLS: QUESTIONS**

**iv The City of Tshwane Municipality: Officials**

1 What do you understand about the concept environmental education?

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2 How did you find out about the concept environmental education?

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3 Which environmental education programmes and/or projects do you implement?

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4 Who is your target group with regard to these environmental education programmes and/or projects?

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5 Who training did you receive in environmental education? Tick what is applicable to you.

Work shop	In-service training	Tertiary training
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Other, specify \_\_\_\_\_

6 What qualification/s do you have in environmental education? Tick what is applicable to you.

Certificate	National Diploma	Degree	Masters	Doctoral
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Other,  
specify \_\_\_\_\_

7 How do you ensure the effective implementation of environmental education programmes and projects for your target group?

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8 How effective is the collaboration between various government department officials with regard to implementing environmental education programmes and/or projects?

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9 How effective are the environmental education partnerships regarding projects and/or programmes in your target group?

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10 Which coordination systems are in place to ensure the effective implementation of environmental programmes for your target group?

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11 What role can a team of officials from various departments play to ensure the effectiveness of EE initiatives?

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12 How can EE actions be managed to ensure their effectiveness and lasting effect.

**APPENDIX D: EVIDENCE OF BONTLE KE BOTHO SUSTAINABLE PROGRAMME**



Jojo tank



Shade structure

