ZIMBABWE'S ENVIRONMENTAL EDUCATION PROGRAMME AND ITS IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT

By

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DECLARATION

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Jemitias Mapira

DEDICATION

This dissertation is dedicated to my late parents: Leonard and Neriah Mapira who, through their prayers, godly counsel and moral support, inspired me to strive for the highest academic achievement in life. As models in my Christian life, I owe them an eternal fund of gratitude. I also dedicate it to my dear wife, Stellahmay, and our daughters: Fadziso, Munyasha and Tariro. Thank you for the immense sacrifices you made during my study period. Since my wife is an aspiring doctoral student, I hope this piece of work will provide some inspiration to her.

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ABSTRACT

The *environmental education* (EE)-*sustainable development* (SD) nexus has generated much research and debate at local, national and global levels (Fien, 1993). Although the term EE is quite old, dating back to 1948 in Paris (Palmer, 1998), during the last three decades, it has regained global currency due to numerous environmental challenges that are confronting our planet Earth, including: climate change, land degradation, desertification, and de-forestation, pollution and ozone depletion. The Rio Earth Summit of 1992 generated a new zeal in the provision of EE throughout the world. Since then, many countries have adopted it as a remedial strategy to address these environmental challenges. In Zimbabwe, EE dates back to 1954 during the colonial era when it was provided in the form of conservation education among farmers and in schools and colleges (Chikunda, 2007). The Natural Resources Board (NRB), a department in the Ministry of Lands and Agriculture (which was established in 1941) played a key role in both research and the dissemination of EE (Whitlow, 1988). However, throughout the colonial era and up to the end of the millennium, the country did not have a written EE policy document. Consequently, various government departments and organisations, which provided EE, did so individually.

However, this fragmented approach proved to be ineffective and had to be abandoned through the promulgation of the Environmental Management Act (Chapter 20:27) of 2002. This development led to the establishment of an environmental management agency (EMA), which harmonised the provision of EE at local and national levels. This study based on information that was collected between 2011 and 2014, examines Zimbabwe's EE programme and its implications for sustainable development. It employed a mixed methods research design which enabled the researcher to employ both qualitative and quantitative approaches in data collection, interpretation and analysis. Derived from the pragmatic school of thought, this research design allows researchers to triangulate with different methods without provoking epistemological conflicts from other schools of thought. The study shows that nearly 84% of the EE in the country is provided by the formal education sector (which includes schools, colleges and universities) while the remaining 16% is derived from non-formal and informal education

sources such as: EMA, some government ministries and departments, and several non-governmental organisations (NGOs).

However, the bulk of the EE provided in Zimbabwe is **biophysical** in nature and is geared at transmitting facts **about** rather than **for** the environment (Fien, 1993; Chikunda, 2007 and Mapira, 2012a). Consequently, it does not instil a **sense of environmental stewardship** among ordinary citizens as reflected by increasing cases of environmental crimes including: land degradation, veldt fire outbreaks, deforestation, and the poaching of elephants, rhinos, and other wildlife resources. Furthermore, most people lack a deep knowledge of basic concepts such as EE, SD and ESD, indicating the weakness of the country's EE efforts. The study makes several recommendations for the improvement of the country's EE programme, including: more funding of EMA and its partners so that they can execute their mandate more efficiently, and revising school and college curricula with a view to infusing EE in courses and syllabi. Other recommendations are that EE should be made compulsory in all formal educational institutions while the state should take environmental issues more seriously than it has done in the past. For example, top government officials should refrain from the poaching of endangered wildlife resources like elephants and rhinos if their country's EE policies have to be taken seriously at the grass roots level. Stiffer penalties should be meted out to those found guilty by courts of law while ordinary citizens need more educational campaigns if they have to develop environmental sensitivity and a sense of stewardship, which are necessary ingredients for the success of any country's EE programme. Furthermore, alternatives of making a living should be created for villagers and peasants so that they do not have to damage their environment in order to survive. Finally, this study argues that if all the above challenges are fully addressed, Zimbabwe's EE programme can achieve its goals in the long run.

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LIST OF ACRONYMS

AGRITEX-Agricultural, Technical and Extension Services

AMCEN-African Ministerial Conference on the Environment

APAs- African Purchase Areas

APA-American Psychological Association

AREX- Agricultural Research and Extension

BSAP- British South Africa Company

CAMPFIRE-Communal Areas Management Programme for Indigenous Resources

CDU- Curriculum Development Unit

CEC-Commission of Education and Communication

CFCs-Chlorofluorocarbons

CONEX-Conservation and Extension

DDC-District Development Committees

DNR-Department of Natural Resources

EA- Environment Africa

EE-Environmental Education

EIA- Environmental Impact Assessment

EEASA-Environmental Education Association of Southern Africa

EMA- Environmental Management Agency

ENDA-Environment Development Activities

ES-Environmental Science

ESD-Environmental Education for Sustainable Development

FC-Forestry Commission

FTRLRP-Fast Track Land Reform Programme

GDP-Gross Domestic Product

GoZ-Government of Zimbabwe

ICAs- Intensive Conservation Areas

IES- Institute of Environmental Studies (UZ)

IKS-Indigenous Knowledge Systems

ISO-International Standards Association

IUCN-International Union for the Conservation of Nature

MDC-Movement for Democratic Change

MDGs- Millennium Development Goals

MMET-Ministry of Mines, Environment and Tourism

NEPAD-New Partnership for Africa's Development

NTPD-National Tree Planting Day

NCS-National Conservation Strategy

NGOs-Non-governmental Organisations

NPAs-Native Purchase Areas

NRB- Natural Resources Board

PWMA-Parks and Wildlife Management Authority

REEP-Regional Environmental Education Programme

REES-Regional Environmental Education Support

RDM-Regional Drought Monitoring Organ

RSS-Research and Specialist Services

SADC- Southern African Development Community

SAFIRE-Southern Alliance for Indigenous Resources

SD-Sustainable Development

SNAs-Special Native Areas

SOP-Standard Operating Procedure

TFCAs- Trans-frontier Conservation Areas

TLACC-Tribal Land Authority Conservation Committees

TTLs-Tribal Trust Lands

UDI- Unilateral Declaration of Independence

UNCED-United Nations Conference on Environment and Development

UNDESD-United Nations Decade for Sustainable Development

UNEP-United Nations Environment Programme

UNESCO-United Nations Educational, Scientific and Cultural Organisation

UZ-University of Zimbabwe

VIDCO-Village Development Committee

WADCO-Ward Development Committee

WCED-World Commission on Environment and Development

WCS-World Conservation Strategy

WESSA-Wildlife and Environment Society of South Africa

WES-Wildlife and Environment Society

WSSD-World Summit on Sustainable Development

ZANU-PF-Zimbabwe African National Union-Patriotic Front

ZELA-Zimbabwe Environmental Law Association

ZIANA-Zimbabwe Inter-Africa News Agency

ZWA-Zambezi Water Authority

ZWEELF-Zimbabwe Environmental Education Consultative Forum

CHAPTER ONE: INTRODUCTION

1.0 Introduction

A major challenge which the world has been facing since the Industrial Revolution is that of environmental degradation (Otiende, 1997). Some of the causes of environmental degradation are: global warming and climate change, ozone depletion due to atmospheric pollution, deforestation, desertification, and water pollution. In response to this global crisis, many countries all over the world have adopted mitigation strategies, which are enshrined in their laws and policies (Miller, 1994). The main goal of these strategies is to reduce further damage to the environment and to achieve Sustainable Development (SD). However, at both national and global levels, several hurdles have emerged. They include: modern civilization's heavy dependency on fossil fuels, technology that causes both air and water pollution, reliance on wood fuel, which triggers and perpetuates deforestation, a weak legal framework that is inefficient in dealing with the prevailing problems, poverty, which reduces the ability of some countries to deal with environmental problems, and lack of political will to take environmental issues seriously among some governments.

The latter problem, coupled with poverty has been quite serious in developing countries such as Zimbabwe (Moyo, 1991). Following United Nations conventions during the last decade, the Southern African Development Community (SADC) countries, in line with global trends, adopted environmental education (E.E.) and education for sustainable development (E.S.D.) as tools, which are geared at promoting environmental awareness, protection and education (SADC Report 4, 2006). However, the new concept has generated much controversy as some researchers view it as mere rhetoric that is aimed at hoodwinking the global community while old forms of environmental degradation continue unabated (Fien,1995). According to Sauve(1996,22), '*This conception of sustainable development (ESD) leads to the same educational proposals that characterized the previous conception (EE)*'. A discussion of the relationship between EE and ESD is presented in Chapter Two. Since little is known about the progress that has

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occurred in some of these countries, this study seeks to examine Zimbabwe's performance in its goal of achieving S.D. through its EE and ESD programmes. This is done in the light of the objectives, research questions and conceptual framework of the study.

1.1 Background to the Study

Since the 1960s, environmental degradation has become a global concern among governments, policy makers and researchers (Miller, 1994). To date, there is a general worldwide consensus that the earth is under serious threat due to the negative impacts of human activities (Simmons, 1991). Although they have escalated during more recent decades, most of these impacts can be traced back to the advent of the Industrial Revolution during the 19th century (Panneerselvam and Ramakrishnan, 1996). Increasing human and livestock populations, industrialization, urbanization and numerous forms of machinery have become a major threat to the delicate ecological balance, which the earth enjoyed before the advent of modern technology. Some of the problems, which emerged from the current crisis include: global warming and climate change, ozone depletion, deforestation, desertification, air and water pollution (WCED, 1991). Since most of these problems cut across national and political boundaries, concerted efforts by the global community have been necessary.

The emission of greenhouse gases such as carbon dioxide, methane, nitrous oxide and carbon monoxide together with ozone-depleting pollutants such as chlorofluorocarbons (CFCs) are a threat to the natural state of the atmosphere (Simmons, 1995). Although most of these problems originate in the industrialised countries (Europe, USA, Russia, China and Japan), their effects have impacts on the poor, less industrialised countries of the Third World (Miller, 1994). For example, USA and China together are responsible for the emission of 40% of total global carbon into the atmosphere, and yet they have been reluctant to enter into legally binding global agreements for the reduction of their emissions (*SABC News International, 12/12/09*). One of the most well known global

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conventions on the state of the environment was the World Commission on Environment and Development (WCED), which was presided by Gro Harlem Brundtland, Norway's former prime minister. In 1987, the commission published its findings, goals and resolutions, which were aimed at environmental protection and sustainable development. Environmental protection is subsumed in the SD concept, whose aim is to:

''*meet the needs and aspirations of the present without compromising the ability to meet those of the future''* (WCED, 1991, 40).

Organised by the General Assembly of the United Nations, the commission was tasked to achieve four main goals including: proposing long-term environmental strategies for achieving SD by the year 2000 and beyond, recommending the ways in which concern for the environment could be translated into greater co-operation among different countries across the globe, considering strategies by which the international community could effectively deal with environmental problems, and developing shared perceptions of long-term environmental issues and the appropriate efforts needed in order to achieve SD. However, the WCED report (*Our Common Future*) has attracted at least two criticisms since its publication. Firstly, according to Palmer (1998, 64), '*it set a very broad and complex agenda for change in the direction of achieving sustainable development, without identifying the many and specific barriers that exist to achieving the intended goals. Mechanisms for achieving the end results appear as rather vague statements lacking in precision or guidelines for translating them into specific actions*'.

Secondly, other critics argue that the world '*should not assume that we can look for solutions to our problems within the framework of the current development pattern…Because the present structures have given us the disease, is it then logical that they should also provide the cure? This seems to be the limitation of this Commission because, it…stemmed from the current framework*' (Palmer 1998, 65). The phrase '*current framework*' refers to the Western mode of development (capitalism or materialism), which is responsible for the current global environmental crisis. For these reasons, some researchers advocate a radical shift from the current modes of development

to more sustainable models. For example, proponents of the Gaia theory, lobby for '*a concept of development that is based on restoring internal control, creating stability and peaceful co-operation*' among all stakeholders (Palmer, 1998, 66).

 Following the Brundtland Commission, the UN convened *The Earth Summit* of 1992 in Rio de Janeiro (Brazil) in June (3-14). The conference gave birth to Agenda 21, a detailed document comprising some 40 chapters, which covered various issues including: poverty, toxic waste, desertification, education and trade. Another document, commonly known as the Rio Declaration, was also produced at the summit. It was a statement comprising 27 principles for SD. While the Rio Declaration was a blueprint for a sustainable future, Agenda 21 was a guideline for its interpretation (Palmer, 2003). The Earth Summit drew 120 heads of states and governments as well as delegates from over 170 countries. As the global environmental crisis continues to attract research and debate, EE has emerged as a major mitigation strategy throughout the world. Panneerselvan and Ramakrishnan (1996, 6) define EE as a:

"*way of implementing the goals of environmental protection. Environmental Education is not a separate branch of science but it is a life-long integral education*".

Since 1989, the UN has organised several world conferences, which have been aimed at discussing ways of protecting the environment, arrest further damage and promote SD. Some of the issues discussed, according to the World Commission on Environment and Development (WCED, 1991) have included: climate change, ozone depletion, deforestation, desertification, drought, conservation of bio-diversity, development of environmentally sound biotechnology, waste disposal methods and improvement of the living conditions of the poor. At global level, since the Rio Earth Summit of 1992 several achievements have occurred (Lotz-Sisitka, 2005, 12). Firstly, most countries have established government agencies, which are responsible for environmental issues, which are becoming more important concerns in national development projects. Secondly, many institutions and organisations, which deal with environment and development issues, have been created. They include such groups as: women, business, industry, indigenous

communities, local authorities and non-governmental organisations (NGOs). These organisations operate at local, national, regional and global levels. Thirdly, major international organisations are now involved in promoting SD by addressing problems of environmental degradation. Science and technology are also contributing significantly to human understanding and knowledge of the environment and to improve the process of SD. Furthermore, several improvements have occurred such as: decline in population growth, reduction in mortality rates, health and educational advances. However, Southern Africa has remained backward in all these areas. A major outcome of Agenda 21 has been a growing focus on "*the need for wide scale environmental education programmes in diverse settings and the need to re-orient all education and training towards sustainable development, while many international conventions and national policies include and emphasise education and capacity building*" (Lotz-Sisitka, 2005, 13).

In spite of these positive developments, serious gaps have emerged in the implementation of Agenda 21, according to the same author. They include: a fragmented approach toward SD, no major changes in unsustainable patterns of consumption and production, lack of mutually coherent policies in finance, trade, investment, technology and SD, insufficient financial resources, no substantial mechanisms for the transfer of technology, the impacts of economic globalisation (market liberalisation) on trade, culture, social life and the natural resource base, and the increased dominance of neo-liberal orthodoxy and the rapid spread of global capitalism (which lead to increased gaps between the rich and the poor, increased inequality and consequent poverty). Other challenges are: lack of trickle-down effects of economic development to some parts of the world, narrow, poor and uncritical articulation of SD, lack of political and social will to close the inequality gaps as shown by increased consumption and production patterns especially among the elite classes, and the general lack of political, social and economic will to reverse current patterns of over-consumption and production among wealthy classes and countries, respectively.

Over the years, many countries across the globe have adopted EE as a national strategy of sustainable environmental protection. The general aim of EE has been to promote

environmental awareness with a view to protecting the natural environment for the achievement of sustainable development at local, national and global levels. It can be conducted at institutional levels (schools, colleges and universities) and at the grassroots (villages and communities). The term **Environmental Education** was first used in France (Paris) in 1948 (Palmer, 2003). By the 1970s, it had gained currency in its application at global level. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) convened its first inter-governmental conference on EE in the former USSR in 1977 (Tbilisi). The Tbilisi Report defines and goes further to outline the aims and objectives of EE.

In more recent years, SADC has identified Environment and SD as a priority intervention tool (SADC Report, 2006). Zimbabwe, as part of SADC, is a signatory to the SADC protocol on the UN Decade on Education for Sustainable Development (UNDESD), which runs from 2005 to 2014 (Lotz-Sisitka, 2005). In 1993, SADC '*initiated the development of a Regional Environmental Education Programme (REEP), and formalised this initiative in 1997 when implementation partners were secured. The overall objectives of enabling environmental education practitioners in the SADC region to strengthen environmental education processes for equitable and sustainable environmental management choices, guides the programme*' (SADC REEP Information Brochure, 2008:1). Since its inception, the organisation has been involved in supporting policy development processes, production of ESD literature, networking, training of manpower and research and evaluation.

The SADC REEP seeks to achieve five Millennium Development Goals (MDGs), which are relevant to ESD. According to Lotz-Sisitka (2005), they include: the eradication of extreme poverty and hunger, universal primary education, gender equality and women empowerment, combating diseases such as malaria, HIV and AIDS, and getting rid of colonially inspired subject boundaries. A major activity of the regional organisation is to mainstream '*environmental education for sustainable development into southern African countries. Through its focus on transformative learning and capabilities for socio-ecological resilience and sustainable development the SADC REEP contributes to the*

policy objectives of the environment and education sectors' (SADC REEP Information Brochure, 2008:2). Based in Howick (South Africa), SADC REEP's environmental education centre promotes networking and knowledge exchange within the region. According to the above information brochure ESD research is conducted in collaboration with Rhodes University, which has been approved by the United Nations University as the SADC region's centre of expertise. As mentioned previously, this study seeks to survey/examine Zimbabwe's EE programme since the colonial era. This is done in the light of the developments, which are currently taking place in the SADC region and elsewhere in the world.

1.2 Statement of the Problem

Concern for the plight of the global environment during the latter part of the 20th century led to the formation of the World Conservation Strategy in 1980 (Miller, 1994). Its main goal was to preserve the biosphere and promote SD through resource conservation (Palmer, 1998). According to Miller,1994), three organisations were responsible for its formation, namely: the International Union for the Conservation of Nature and Natural Resources (IUCN), the United Nations Environment Programme (UNEP) and the World Wide Fund for Nature (WWF). Following this development, Zimbabwe launched its first post-independence official policy document known as the National Conservation Strategy (NCS) in 1987. It took the country some five years to produce the blue print (1982-87). According to Lopes (1996: 168), the goal of the NCS was to:

'*integrate sustainable resource use with every aspect of the nation's social and economic development and to rehabilitate those resources which are already degraded*'.

However, the NCS recommendations were never put into effect due to the lack of political will at the implementation stage and, institutional and budgetary constraints. As a consequence, Zimbabwe has been criticised for not adhering to its own laws on the environment (Bengtsson, 1996). At the official planning level, the country has continued to employ top-down approaches instead of bottom-up strategies in its policy making and implementation approaches. This is reflected by budgetary systems, which are centralised

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and leave no room for participation during and after the planning process (Lopes, 1996). This has created numerous conflicts and frustrations at various levels of formal planning systems in general. Grass-roots participation in decision-making is generally ignored and yet it is an essential ingredient if development projects have to succeed (Nkala, 1996).

Zimbabwe adopted EE during the colonial era and has continued to disseminate it through formal and non-formal sectors of its education system (Chikunda, 2007). In preparation for the Rio Summit of 1992, the government compiled a report, which advocated for several issues, which would form part of its policy on the environment. According to Lopes (1996), they included: the arrest of land degradation in communal areas, improved legislative framework, making rural people more accountable for their environment, development of materials and campaigns targeted at schools and inclusion of environmental studies in teacher's training colleges. Although they are under-funded, non-governmental organisations (NGOs) in Zimbabwe also play a remarkable role in the development of the country (Auret, 1990). Examples include: Environment 2000, Christian Care, Environment Africa, and Care International.

Some NGOs such as the Environmental Development Agency (ENDA) Zimbabwe, and Zimbabwe Environmental Research Organisation (ZERO), prepared their own reports for the RIO Summit, arguing that land reform and resettlement were necessary if SD had to be achieved in the country's communal areas (Lopes, 1996). During the last decade, Zimbabwe embarked on a 'fast track' land reform programme, which has been criticised for its violent nature and corruption (Bond and Manyanya, 2003). In practice, the problem of land hunger in the communal areas remains critical and there is a need for a more transparent redistribution programme, which will address the needs of the landless majority. Multiple-farm ownership by some government and ruling party (ZANU-PF) officials has tarnished the image of the land reform (*The Zimbabwean Vol. 5 No. 47: 26 November, 2009: pages 1-2)*.

Before the advent of the new millennium, Zimbabwe's legislative framework on the environment was highly fragmented (Mapira and Mungwini, 2005). Different ministries

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had their own laws on environmental issues, for example: Agriculture, Mining, Industry, Tourism and Environment. This fragmented approach often led to inter-ministerial conflicts as each ministry was governed by its own laws (Gandiwa, 2004). One of the most powerful laws was that of the mining sector, which took precedence over other laws. According to Chiwota and Hauge (1996, 129):

'*The Mines and Minerals Act (1977) is a powerful Act which overrules most other Acts in that very few restrictions are attached to the exploration of mining rights once a mining permit has been obtained. However, the Act leaves the way open for mining ventures to have negative impacts on the environment through extensive timber felling without reforestation, poaching by mine-workers, siltation, minimum mine dumps management and supervision, and non-compliance with quittance requirements when a mine is closed*'.

In order to address the problem of conflicting laws and to harmonise their operations, a new law was introduced, namely the Environmental Management Act (Chapter 20:27) of 2002 (Gandiwa, 2004). The Act led to several developments including: the establishment of an Environmental Management Agency (EMA) and an Environment Fund, amendment of references to intensive conservation areas and committees and associated matters in various Acts, repealing of the Natural Resources Act (Chapter 20:13), the Atmospheric Pollution Prevention Act (Chapter 20:03), the Hazardous Substances and Articles Act (Chapter 15:05) and the Noxious Weeds Act (Chapter 19:07) and provision for matters connected with or incidental to the above.

Operating under the Ministry of Environment and Tourism, the new Act overrides other laws except '*where it is expressly provided to the contrary*' (EMA, 2002:359). The Act states that every person has a right to: a clean environment that is not harmful to health, access to environmental information, protect the environment for the benefit of present and future generations, and participate in the implementation of laws, which are aimed at protecting the environment. One of EMA's goals is to promote EE and environmental awareness at both local and national levels. It seeks to engender values, attitudes, skills

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and behaviour, which promote sustainable environmental management. The overall aim of the Act is to promote SD in all aspects of development, which are linked to the environment. Although EMA has been in operation for nearly a decade, little is known about its performance on the achievement of SD and EE, a gap, which this study seeks to fill.

At global level, EE has a fairly long history, which dates back to the late 1940s when the term was first used in Europe. In the UK, the term was introduced in 1965 (Palmer, 1998). Over the years, the concept has evolved into a global strategy aimed at mitigating the adverse effects of environmental degradation through the promotion of public environmental awareness. Hence, the main goal of EE is to protect the natural environment and achieve SD in the long run. All the 14 SADC countries (*including Zimbabwe*), under the UN Decade of ESD have agreed to adopt EE and ESD and they are at varying levels of the implementation process (SADC Report, 2008). Although Zimbabwe has also adopted the EE and ESD programmes as a national strategy, little is known about its progress so far.

Consequently, the aim of this study, as mentioned earlier, is to survey/examine the country's EE programme since the colonial era. This is done in the light of the research questions, objectives, literature review, and conceptual framework presented in this study. The survey takes into account the experiences of other countries, which are cited in this study. These include: Australia, Canada, China, UK, USA, Kenya and Uganda, and the SADC region in including: Botswana, South Africa and Tanzania. While giving global and regional perspectives of the EE programme, they also provide important lessons, which can be used as a framework for an examination/survey of the Zimbabwean EE programme. As a member of the SADC region, the country is a signatory of the region's SD and ESD goals, an issue, which the study takes into consideration (Lotz-Sisitka, 2005).

1.3. Research Questions

The following research question and sub-questions are proposed for the study:

Research question

How are EE and SD concepts understood in literature and how have they been applied at global level and in Zimbabwe?

Sub-questions

a) Which EE approaches are used in Zimbabwe and what challenges have they encountered so far?

b) Are EE programmes in Zimbabwe oriented towards SD?

c) What implications do they have in Zimbabwe's quest for SD?

d) Which solutions or strategies can be suggested for their improvement?

1.4. Objectives of the Study

The main objectives of this study are to:

a) Shed light on Zimbabwe's EE programmes and their implications for SD

b) Generate information on EE programmes for the benefit of researchers, policy-makers and ordinary people, and

c) Provide lessons, which can benefit other countries pursuing similar programmes.

1.5. Assumptions of the Study

This study is based on three assumptions, which include:

a) Little is known about Zimbabwe's EE programme, hence there is a need for detailed studies such as this one

b) Since the promulgation of the country's EE policy document in 2003, Zimbabwe has encountered some challenges/problems, which call for investigation and solutions in the country's quest for SD at local and national levels, and

    c) Lessons drawn from Zimbabwe's experience can benefit researchers, policy makers and some developing countries pursuing EE programmes.

1.6. Study Area

Zimbabwe is located in Southern Africa and is part of the 14 member SADC regional grouping. A land -locked country, it shares borders with Botswana to the west, South Africa to the south, Mozambique to the east and Zambia to the north. It has a population of 12.9 million according to the last census, which was conducted in 2012 (CSO, 2012). In 1992, it had the second highest literacy level in Africa after Tunisia (CSO, 1992). At that time, its rate was 83% and by 2002, this had risen to 85% (CSO, 2002). To date, it has the highest literacy rate on the African continent pegged at nearly 92 % (CSO, 2012). This remarkable achievement can be attributed to the massive expansion in educational facilities, which the black government launched soon after independence in 1980 (Auret, 1990). There was also a massive expansion in the number of tertiary institutions including: teacher's colleges, polytechnics and universities (Patsanza, 1988). To date, the country has thousands of schools, numerous colleges and 14 universities, including 8 state-run and 6 privately owned ones (Mapira and Ngwenya, 2009). However, in spite of these positive developments, the country has been plagued by numerous problems including: land degradation, political turmoil, economic down-turn, decline in educational standards due to increasing poverty levels, chronic droughts, food shortages, the flight of skilled manpower into the *Diaspora* (*especially neighbouring countries such as South Africa and Botswana*) and environmental problems as rural communities try to eke out a living out of resources such as: minerals, wood fuel and other forms of wildlife (Bond and Manyanya, 2003).

In urban areas, some of the major environmental problems are: waste disposal, air and water pollution (Chenje and Johnson, 1994). The disposal of solid waste has led to the emergence of numerous dumps, which pose health risks to urban residents (Masocha and Tevera, 2003). In Masvingo, the city's only solid waste dump has been notorious for providing breeding conditions for flies, mosquitoes and rats, common disease vectors

(Mapira 2011b). On the other hand, sewage disposal problems have led to the pollution of rivers, which pass through some urban centres. For example, since the 1990s, the Mukuvisi and Nyatsime Rivers have been heavily contaminated leading to the pollution of Lake Chivero, Harare's main source of water (Bagg, 1992). In Masvingo, the Shagashe River, a tributary of the Mutirikwe, the main source of water for the city has also been heavily polluted (Mapira, 2011a). Attempts to solve these problems have failed due to the inadequate funding of municipalities and urban councils (Mapira and Mungwini, 2005). On the other hand, rapid urban population growth rates exert pressure on ageing sewers resulting in bursts and blockages (Mapira, 2007).

Land degradation in communal areas is partly due to increasing population and overstocking pressures. For example, according to Whitlow (1988), from 1964 to 1977 these areas experienced population and livestock increases of about 119% and 50%, respectively. The result was that

'*by the late 1970s environmental degradation had reached such critical levels that it would take several decades for processes of regeneration to restore the vegetation and soil cover to a productive state, assuming that population pressures were drastically reduced and measures were taken to encourage such regeneration*' (Mapira, 2011c :6).

Mazvimavi (1989) claims that due to **El Nino** events, Zimbabwe experiences a drought once every three to five years and a very serious one once every ten years. According to Mapira (2011c: 7) '*the effects of droughts in the country include: water scarcity, dwindling pastures, death of livestock and food shortages. Apart from exerting pressure on the national budgets droughts also impact negatively on… peasants who depend on rain-fed agriculture*'.

Environmental management efforts have also deteriorated since the inception of the country's *Fast Track Land Reform Programme* in the new millennium. Chimhowu, Manjengwa and Feresu (2010: 65) state that,

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'*While the exact figure for the rate of deforestation in Zimbabwe is unknown, estimates suggest that deforestation ranges between 100 000 and 320 000 hectares per year*'

Gold and diamond panning have also worsened land degradation in various parts of the country while the poaching of wildlife in the form of plants and animals has exacerbated the problem. The same researchers claim that at least one million panners operate along more than 5 000kms of the country's rivers. Poverty is the main cause of this environmental crisis (Chenje and Johnson, 1994). Although Zimbabwe has a Ministry (Environment and Natural Resources), which is responsible for environmental protection as well as numerous NGOs, which complement government efforts, this has not curbed the problem at both local and national levels.

The country is also a member of several international organisations, which seek to promote environmental sustainability. Examples, according to Chimhowu, et. al, (2010), include: Convention to Combat Desertification, Framework on Climate Change, Convention on Biological Diversity, Montreal Protocol to phase out Ozone Depleting Substances, Bamako Convention on the Ban of the Import into Africa, and the Control of Trans-boundary Movement and Management of Hazardous Wastes within Africa, and Stockholm Convention to phase out or restrict the use and trade in persistent organic pollutants (POPs). In 2007, Zimbabwe's Minister of Environment and Tourism was elected to chair the UN Commission on SD. This was an acknowledgement of the country's leading role in the sustainable use and management of resources (G.o.Z, 2009).

At global level, E.E. has been adopted as one of the long term solutions to environmental problems (Palmer, 2003). As mentioned previously, Zimbabwe's E.E. programmes originated during the colonial era, even though little is known about them due to the lack of publicity. Consequently, this study seeks to fill this gap through a survey or examination of the country's formal, informal and non-formal institutions, which provide EE (G.o.Z, 2003). They include: schools, colleges and universities, Government Ministries, Departments and Non-Governmental Organizations (NGOs). A survey/examination of their operations in the quest to achieve SD through EE is expected

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to yield the required information. This, in turn, is expected to augment Zimbabwean literature on this topical issue. The survey is done in the light of the research questions and objectives (Chapter One) as well as the conceptual framework of the study (Chapter Three).

1.7. Significance of the Study

With the exception of Australia, Canada and the UK, at global level, there is a general lack of success stories in the implementation of EE programmes (Fien, 1993). This has been attributed to several factors including: the lack of political will, types of EE approaches used, resource constraints, lack of EE success stories and ordinary people's negative attitudes toward environmental issues (Palmer, 1998). Although Zimbabwe's EE initiatives have a fairly long history, which dates back to the colonial era, in recent years, it has gained a new thrust, propelled by the SD concept, which emerged during the late 1980s. Previously, EE existed in the form of fragmented conservation education in formal, non-formal and informal institutions. However, in 1994 a new syllabus was introduced in primary schools in order to address challenges emanating from emerging global environmental problems (*Primary School Environmental Science Syllabus*, 1994). Throughout the colonial era and the first two decades after independence, the country did not have an official EE policy in spite of the fragmented efforts that have been mentioned above.

Zimbabwe's EE policy was promulgated in 2003 with the goal of making '*sustainable development a national priority, to take a pro-active role in environmental issues and to respond to environmental challenges facing Zimbabwe at the personal, local, national, regional, and global levels through education and communication processes*' (G.o.Z, 2003:3).While in secondary schools, plans are under way to integrate EE in subjects like Geography, Science and Agriculture, in informal and non-formal education circles, it is conducted mainly by some government ministries and departments, EMA, non-governmental organisations (NGOs), municipalities and lobby groups aimed at promoting environmental sustainability at local, national and regional levels. However, in spite of these developments, little is known about the country's EE programmes. Consequently,

this study seeks to fill this information gap by providing information, which can benefit researchers, planners and policy makers in Zimbabwe and other developing countries, which seek to implement EE programmes.

1.8. Limitations of the Study

Three factors could have limited the quality of the study, namely: time, funds and study areas to be used. The time allocated for the study was restricted to the duration of the study programme, which was three to four years. However, efforts were made to ensure that maximum benefits were derived from the time that was available for all the stages of the research programme. For example, the researcher employed research assistants in order to administer some of the interviews and questionnaires in those areas, which were not readily accessible to him. Although this increased expenses, prudent budgeting solved this problem. Finally, not all schools, colleges, universities and NGOs could be visited. Consequently, the researcher had to carefully draw samples of these institutions and organisations before embarking on the fieldwork.

1.9 Definition of key Terms

This section defines some key terms, which run through this study, including:

Curriculum greening is an attempt to broaden existing subjects or disciplines by adding environmental topics to them (Manjengwa, Price and Stiles, 1999). The aim is to develop curricula, which are broader, more balanced and capable of addressing prevalent environmental crises (Mbiba, 2003). Examples of subjects, which have benefited from curriculum greening in schools, colleges and universities to date, are: Geography, Agriculture and Natural Sciences in general.

Environmental Education (EE) seeks to educate people about their natural and cultural environs with a view to conserving them for both present and future generations. First coined in 1948 in Paris (France), in more recent decades, the term has gained currency at global level in response to emerging environmental problems such as: global warming and climate change, desertification, air and water pollution (Palmer 1998). It has evolved to become a major subject or discipline in some schools, colleges and universities

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(Chauhan, 2009). Its growing popularity is due to the realization that the Earth is under increasing stress due to human activities dating back to the Industrial Revolution of the 19th Century (Miller, 1994).

Environmental (Ecological) Literacy refers to the level of environmental knowledge or awareness of individuals in a community (Chauhan, 2009). It develops gradually as people interact with the natural environment around them. Consequently, it might be higher among rural folks and lower among urbanites. As people interact with their environment over a long period, they develop what has been commonly referred to as indigenous knowledge, a type of wisdom that is based on an understanding of the laws of nature around them (Mapira and Mazambara, 2013). It has been argued that the urbanisation process reduces ordinary people's environmental awareness levels or ecological literacy (Le Grange, 2007).

Education for Sustainable Development (ESD) has emerged in recent decades to refer to a new type of education, which marries the older concept of EE to the relatively new one, SD (SADC Report, 2006). Although EE has always been geared towards the achievement of SD, during the last two decades this link has been popularized, adding a new zeal. Molapo (1999:5) has defined ESD as: '*a lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, and commitment to engage in responsible individual and cooperative actions. These actions will help ensure an environmentally sound and economically prosperous future*'.

Environmental Legislation refers to the passing of laws aimed at protecting the natural environment especially biological diversity (Miller, 1994). Most countries now have laws, which seek to safeguard their natural ecosystems and cultural environments against further damage (Chauhan, 2009).

Environmental Stewardship is a term used to refer to mankind's ability to take care of the natural environment with a view to protecting it from further damage (Miller, 1994). This is a major goal of EE at local, national and global levels (Palmer, 1998).

Formal Environmental Education is a form of EE, which according to Molapo (1999: 7) '*takes place in a structured way, within formal education systems, at pre-primary, primary, secondary and tertiary levels*'.

Green Economy is a term, which has been coined in recent years to refer to a type of development that is geared at the achievement of SD. According to Palmer (1998), it involves: a change of cultural attitudes and lifestyles, using (ecological) resources in a more sustainable manner, and re-adjusting technology in order to achieve SD.

Greenhouse Effect is a major cause of global warming and climate change (Miller, 1994). It is caused by an increase in average global temperature increases due to the emission of greenhouse gases such as: carbon dioxide, methane, nitrous oxide, a process dating back to the Industrial Revolution (WCED, 1991).

Green Parties are political parties, which champion the cause of the environment (Miller, 1994).They are quite visible and active in industrialized countries (for example in Europe and North America) where they have influenced environmental legislation considerably. However, in most developing countries, they hardly exist since environmental problems are generally ignored due to the diversion of attention on more pressing issues such as hunger and poverty (WCED, 1991).

Informal Environmental Education is, according to Molapo (1999:7) '*relatively un-structured, and is picked up through the media, peers and personal experience*'.

Mixed method research designs, are '*those that include at least one quantitative method and one qualitative, where neither type of method is inherently linked to any particular inquiry paradigm*' Gray (2011, 199). The use of such designs in social research bridges

the gap between traditionally conflicting methods, namely qualitative and quantitative, which are based on antagonistic schools of thought (positivist and interpretivists).

Non-formal Environmental Education, on the other hand, '*occurs outside of the formal education system (for example, through community programmes, clubs and interest groups) but is usually also planned and structured*' (Molapo, 1999:7).

Sustainability, according to Molapo (1999) refers to three interrelated conditions. Firstly, there is a need for reconciliation between economic development and environmental conservation. Secondly, any understanding of environmental concerns should be placed within the socio-economic and political context. Finally, there is a need to combine the environment and development concerns".

Sustainable Development (SD) has been defined as: a form of development, which seeks to meet the '*needs of the present without compromising the ability of future generations to meet their own needs*' (WCED, 1991:8). SD has at least three dimensions, namely ecological, economic and social (Moffat, 1992). While ecological SD focuses on the biophysical aspects of the environment, the economic dimension deals with issues of production and profitability. On the other hand, social SD addresses such issues as: poverty, inequality and injustice, which prevail in some communities.

1.10. Summary

This introductory chapter has laid a foundation for the whole study as it outlined the main SD and EE issues at global level, in the SADC region and in Zimbabwe. Environmental degradation due to human activities has led to a global crisis, which has no easy solutions. For example, modern civilization's heavy dependency on fossil fuels such as coal and oil has increased carbon emissions and other green house gases, which result in the warming of the earth's atmosphere. Since the publication of the World Commission on Environment and Development (WCED) report (*Our Common Future*) in 1987, the term Sustainable Development (SD) has gained global currency and many international conventions have been held in order to discuss and debate on problems such as: climate

change, ozone depletion, deforestation, desertification, drought, bio-diversity loss, waste disposal and their possible solutions.

Zimbabwe, in keeping with other SADC countries, has developed a national environmental policy which seeks to provide solutions to some of these problems (GoZ, 2009). One of the solutions that have been suggested is that of Environmental Education (EE). Although it dates back to the 1940s, this concept has been re-invigorated in more recent decades and is viewed as one of the possible solutions to the current global environmental crisis. Since the 1990s, EE has been married to SD, leading to the emergence of a new jargon, namely Education for Sustainable Development (ESD). The controversy surrounding EE and ESD has been mentioned in passing in this chapter and is discussed in detail in the next chapter. Chapter One also provides a statement of the problem for this study through an explanation of reasons for Zimbabwe's adoption of EE and ESD policies.

This is followed by a list of research questions and assumptions that form the basis of this study. Other issues included in the first chapter are a description of the study area, significance of the study, its limitations, definitions of key terms, and acronyms of terms that are used throughout the study. Chapter Two provides a theoretical framework of the study in the form of a detailed literature review. This is followed by Chapter Three, which outlines the conceptual framework of the study. Chapter Four discusses the various methods, which are employed throughout the study. Chapters Five and Six present the main findings of the study while the seventh chapter discusses, analyzes and examines their implications for SD at both local and national levels. The last chapter (Eight) provides conclusions and recommendations for the entire study. This is followed by references and annexures. As mentioned previously, the next chapter critically reviews literature on EE and SD concepts as they have been applied in various parts of the world including Zimbabwe. In this way, it lays a theoretical foundation for the entire study.

CHAPTER TWO: LITERATURE REVIEW

2.0. Introduction

This chapter reviews literature on EE and SD with a view to laying a theoretical foundation for the study. It highlights the application of these concepts at global, regional and national levels. It also paves the way for a critical analysis of the EE programme in Zimbabwe and draws conclusions and recommendations, which emanate from the study. The main issues under discussion in this chapter include: The Plight of the Global Environment, The Quest for SD, The Birth, Growth and Spread of EE and its application in various parts of the world including Zimbabwe. The chapter ends with a section on how Zimbabwe's EE policy was developed and how it has been implemented in the country's formal and informal/non-formal education sectors. Another section also explains the significance of the chapter to the whole study.

2.1 The Current Plight of the Global Environment

The earth, one of the nine planets in our solar system, is estimated to be 4.5 billion years old (Haggett, 1983). During much of its long history, it enjoyed ecological balance and biodiversity until modern human civilization, with its sophisticated technology, brought some negative impacts, which are not easy to reverse (Miller, 1994). Although human beings are believed to be late arrivals on the planet, their impact on its ecosystems have been both tremendous and devastating (Simmons, 1991). However, most of these impacts can be traced back to the beginning of the Industrial Revolution, more than a century ago (WCED, 1991). Some of the major problems, which have emerged as a result of human interference with the earth's natural ecological balance include: global warming and climate change, deforestation, desertification, destruction of some ecosystems, loss of biodiversity, land degradation, ozone depletion and pollution (Leggett, 1990; Miller, 1994). Although these problems have attracted research activity and debate at global, regional and national levels, workable solutions are hard to come by (Benton and Short, 2000).

The biggest single environmental challenge facing global society in the 21st century is climate change (WCED, 1991). According to Miller (1994), global warming and climate change are a result of modern industrialisation, which has accelerated the *greenhouse effect*. Under normal conditions, the greenhouse effect is a natural and beneficial process, which prevents the earth from over-cooling (Muthiani, 1997). By trapping long-wave radiation, the earth's atmosphere conserves some of the heat in order to maintain a steady temperature balance, which is ideal for most life forms on earth. Some of the gases, which are responsible for this process include: water vapour (H2O), carbon dioxide (CO2), Methane (CH4), Chlorofluorocarbons (CFCs), nitrous oxide (NO) and carbon monoxide (CO). However, water vapour is not a problem since it is an integral part of the earth's hydrological cycle and is necessary in the regulation of global climates.

The main causes of climate change therefore, are those gases whose natural proportions have increased due to the effects of industrialisation. They include: carbon dioxide, methane, CFCs, nitrous oxide and carbon monoxide (Miller, 1994). As the most important greenhouse gas, carbon dioxide is produced by the combustion of fossil fuels such as: coal, natural gas and petroleum products. It is also believed that within the next half century, the global temperature due to the increase in greenhouse gases will double. By the year 2030, average global temperatures due to global warming are expected to increase by 1.5 to 4.5●C (Otiende, Ezaza and Boisvert, 1997).

The effects of global warming, according to Muthiani (1997) include: snowmelt in mountains and polar regions, a rise in sea level, which threatens to drown countries which are at or below sea level such as Bangladesh, the Netherlands and islands like the Maldives and Kiribati in the Indian and Pacific Oceans, respectively and an increase in the number of floods and droughts in some parts of the world. The loss of land to the sea is likely to lead to an increase in the number of so-called environmental refugees. The loss of bio-diversity due to the drowning of some coastal areas in the seas and oceans is another negative effect. The depletion of the ozone layer due to CFCs leads to human health problems such as: skin cancer, eye cataracts and immune deficiencies. The

destruction of the ozone layer is also a threat to phytoplankton, the base of marine food chains. Ozone depletion leads to an influx of ultra-violet rays from the sun, which threatens the survival of all organic life (flora, fauna and human beings).

Most of the problems of global warming have been caused by advanced industrialised countries and regions such as: USA, China, Japan and Europe. However, India has also rapidly industrialised in recent years and is contributing to the problem while China's heavy dependency on coal is a cause for concern (Cannon and Jenkins, 1996).Since it has become the second largest global economy after the USA at the end of 2010, its contribution to greenhouse gas emissions is remarkable (*SABC NEWS International, 12 December, 2009*). In the past, both China and USA have been reluctant to reduce their carbon emissions. As global super-powers, they have set a bad precedence (Palmer, 1998). However, some countries in Europe, namely: Britain and Germany have set a good example as shown by their reduction of carbon emissions in recent years. Hopefully, other industrialised countries shall emulate them and follow their example (*The Sunday Mail, 20th December, 2009*).

Africa is the least developed continent on earth, accounting for barely one percent of the global economy (Otiende, et al, 1997). As such, it is the least industrialised continent and has not contributed much to the problem of global warming compared to other continents. However, it has its own problems, namely: deforestation, desertification, biodiversity loss, river siltation, pollution and general poverty, which reduce its capacity to deal with environmental problems at local, national and regional levels. Since global warming and climate change do not respect political boundaries, developing countries suffer more than their more developed counterparts, which are the main causes of the problems but have a greater capacity to deal with them (Orodho, 1997). For this reason, Africa should strive to address global environmental problems as well. The failure of the recently convened Copenhagen Conference to produce a legally binding treaty on carbon emissions is a cause for concern at global level (*The Sunday Mail, 20th December, 2009*).

2.2 The Quest for Sustainable Development (SD)

The establishment of the World Conservation Strategy (WCS) by the International Union for the Conservation of Nature (IUCN) in 1980 can be regarded as a land mark in the global quest for SD. This is because it opened the concept to international debate and discussion for the first time. The resultant document (70 pages long) was a product of the work of 700 scientists and experts as well as 450 government agencies (Palmer, 1998). The WCS, whose goal was to find remedies for the global environmental crisis advocated for the incorporation of three priorities in all development programmes, namely: the maintenance of essential ecological processes, the sustainable use of natural resources, and the preservation of genetic diversity and the conservation of wild species.

The WCS identified and articulated the paradox of economic development in the following quotation:

'*as we increase our demands on the Earth to support us we are reducing its capacity to do so. Forests are being felled and wetlands drained. We are using up the world's irreplaceable stocks of minerals and fossil fuels at an ever-increasing rate. We dump our wastes in the oceans, rivers and atmosphere…and build roads and houses on good agricultural land. We exploit wild animals and plants to the point of economic, if not total extinction. We take for today and think little of tomorrow. The World Conservation Strategy, is a global remedy for this dangerous situation…an instruction manual for keeping the Earth alive*', (Palmer, 1998:60).

Apart from bringing the concept of SD into global currency, it also critically examined the relationships among the economy, development and environment as well as leading to the establishment of a World Commission on Environment and Development (WCED). The discussions and debates, which the commission generated, helped to re-define, analyse and refine information on the concept of sustainability. Beginning in 1983 when it was launched, the WCED formulated several objectives for the achievement of

sustainability, which, according to Palmer (2003), included: reviving economic growth, changing the quality of growth, meeting essential needs for jobs, food, energy, water and sanitation, ensuring a sustainable population size, conserving and enhancing the resources base, re-orienting technology and managing risk, and merging environment and economics in decision-making processes.

The Brundtland Commission published its report (*Our Common Future*) in 1987 and it defines SD as a form of development which:

"*seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future…Environmental protection is thus inherent in the concept of sustainable development, as is a focus on the sources of environmental problems rather than on the symptoms*" (WCED, 1991, 40).

Since then, the concept of SD has generated a lot of controversy due to its multi-dimensional character. For example, at least three types of SD can be recognised; namely ecological, economic and social (Moffat, 1992 and 1996). While the goal of ecological SD is to protect the environment and its ecosystems against further damage thereby preserving biodiversity, economic SD seeks to ensure that economic activities generate profit in the exploitation of resources. Social SD, on the other hand, strives to address the needs of the poor and achieve social justice in the process. With such a diverse character, a major problem of SD is to reconcile these apparently contradictory goals. For example, the goal of economic SD, with its emphasis on profit-generation is not in harmony with that of ecological SD, which seeks to safeguard the environment from further damage.

On the other hand, social SD is also difficult to achieve because of the capitalist orientation of the global community. Capitalism, as a system of government, favours the rich at the expense of the poor (Miller, 1994). In developing countries such as Zimbabwe, for example, the panning of gold and diamonds by some villagers has often led to environmental degradation. Although these poor people are on the forefront of these activities, they sell their products to the rich who buy them at low prices and resell them

at much higher prices in order to maximize their profits (Lopes, 1996).The lack of affordable sources of energy has driven the poor into activities such as deforestation in many communal areas on the outskirts of towns and cities in Zimbabwe (Whitlow, 1988). The practice of land clearance for cultivation and the lack of protein-rich foods in communal areas, forces the poor into the poaching of wildlife and fish leading to the loss of biodiversity (Moyo, 1991). It can be argued that several factors militate against the achievement of SD in various parts of the world. They include modern society's dependency on fossil fuels such as coal, diesel and petroleum, which pollute the land and the atmosphere, wood-fuel consumption, which leads to the destruction of woodlands, major sinks of carbon dioxide, modern technology, whose operations pollute air, water and the land, and industrialisation and urbanisation, which are a threat to natural environments and their ecosystems. Poverty pushes some people into heavy dependency on natural resources such as forest products and wildlife while ignorance and the lack of environmental awareness at grassroots level about the negative impacts of some activities on the local, national and global environments are also contributory factors.

2.3. The Birth, Growth and Spread of EE

It is obvious from the previous section that SD cannot be achieved without the promotion of environmental awareness among the general public. If the goal of environmental protection has to be achieved, EE should be given some priority at all levels. Three major conventions laid a foundation for the global spread of this innovative approach to the protection of the environment. They include: the Stockholm (1972), Belgrade (1975) and Tbilisi (1977) conferences (Palmer, 1998). As a result of these developments, the UN Environment Programme (UNEP) was established with its headquarters in Nairobi (Kenya). While the Stockholm conference endorsed the need for EE at global level, the Belgrade workshop came up with a document that is commonly known as the Belgrade Charter. The charter paved the way for the establishment of mechanisms for the introduction of EE at international level.

The Tbilisi Conference became the birthplace of EE at global level (Palmer, 1998). It outlined three goals, which had been adopted at the Belgrade workshop, namely: to foster clear awareness of and concern about economic, social, political and ecological inter-dependence in rural and urban areas, to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment, and to create new patterns of behaviour of individuals, groups and society as a whole, towards the environment.

Over the years, a lot of research and progress have been made in the field of EE throughout the world (Fien, 1993, Gottlieb, 1997, Mhashu, 1996, Otiende, et al, 1997, Palmer, 1998, Benton and Short, 2000, Witt and Witt, 2000). In both industrialised and developing countries, policies now exist, which seek to promote EE as national strategies of environmental protection and conservation (Palmer, 2003). According to Otiende (1997), the perspectives of EE from a western point of view are likely to differ from those of Africans. This is because of differences in cultures, historical backgrounds and levels of economic development. For example, although poverty is the driving force behind environmental degradation in Africa, the opposite is true for industrialised countries where affluence is the main cause. In other words, while Africans damage their environments out of necessity (poverty), Europeans and Americans do so due to greed (over-consumption). However, it is doubtful whether the western model of EE is appropriate to African countries (Orodho, 1997).

According to some researchers, environmental awareness education is not new to Africans. It is as old as these societies (Otiende, et al, 1997). For example, traditional cultures such as those of the Maasai maintained ecological balance with their harsh environments until colonialism disrupted them. Land expropriation by the colonial masters, commercialisation of agriculture and the introduction of veterinary services led to the overstocking of the landscape with disastrous consequences. However, the more recent concept of EE is quite new to Africans and should be presented with caution (Muthiani, 1997). For example, while the modern concept is based on scientific principles, that of traditional cultures was founded on indigenous knowledge systems

(IKS). The two might be quite different and should not necessarily be viewed as the same.

The Rio Summit of 1992 is well known for Agenda 21, an action plan, which set out national goals for the achievement of SD at local and national levels. Another crucial document, which was signed at the summit, is the Rio Declaration, which contains 27 principles for sustainability. While the Rio Declaration is a blueprint for SD, Agenda 21 provides guidelines for its interpretation (Palmer, 1998). Perhaps the most important achievement of the Rio Summit in terms of EE is that it recommended that environment and development education should be integrated into the learning process at both formal and non-formal levels. By the end of the millennium, plans were already underway for the inclusion of EE as a cross-curricular theme in some countries such as the UK. Consequently, EE became a central element of the national curriculum, progressing through all levels just like other subject areas.

Another important convention on SD at global level is the Kyoto Protocol, which was held in Japan in December, 1997 (Feinstein, Payton and Poore, 1998). Some 39 industrialised countries and others in transition (under the Kyoto Protocol) committed themselves to '*quantified carbon emission limitation and reduction*' so as to restrict green house gas emissions (Feinstein, et al, 1998:51). They agreed to reduce their emissions by at least 5% below their 1990 levels between 2008 and 2012. However, USA and China refused to commit themselves to this obligation. This lack of will among major polluters has undermined global attempts to solve the problem of global warming. The Copenhagen Conference of 2010 in Denmark revealed more divisions among the global community as some countries refused to adopt the Kyoto protocol's resolutions. This widespread lack of will has a bearing on EE as it weakens efforts aimed at seriously addressing issues of the environment as has been the case in Zimbabwe (Lopes, 1995).

Increasing urban growth also undermines our knowledge of environmental issues (*environmental literacy*). According to Le Grange (2007,77), as urbanisation increases, '*our intelligence of the Earth is waning and intelligence itself is becoming more abstract-*

our ecological literacy is on the decline…The symptoms of the… effects…are evident in suffering occurring in the three ecologies: environment, social and mental'. This scenario has a direct impact on many African societies, which are experiencing rapid urban growth and yet they should also provide quality EE to their citizens. In 1990, South Africa had 59% of its population living in towns and cities while Zambia, Tanzania and Zimbabwe had 50%, 33% and 28%, respectively (Chenje and Johnson, 1994). The average annual rates of urban growth were: 3.2% in South Africa, 5.4% for Zimbabwe,5.6% in Zambia and 7.0% for Tanzania.

2.4. General Aims and Concerns of EE

According to Chauhan (2009), the main goals of EE are: to improve the quality of the environment, creating environmental awareness among the public so as to encourage conservation, to ensure that developmental projects are evaluated before their implementation, and developing environmental ethics, which are geared to SD at local, national and global levels. However, other researchers such as Palmer (2003) have an even broader conception of EE as they see its ultimate goal as that of completely changing people's lifestyles so that they can sacrifice their materialistic goals for the sake of the environment. This calls for much personal sacrifice, which most societies are not yet prepared to make as shown by some case studies later on in this chapter.

Since the 1960s Environmental Impact Assessments (EIAs) have been used in order to safeguard the natural environment against further damage due to development projects (Miller, 1994). Chauhan (2009) lists some of the methods, which have been used to check for environmental impacts. Firstly, they include: identifying national policies encouraging harmony between people and the environment, promoting efforts geared to environmental conservation, and increasing public knowledge about ecological systems. Secondly, improving people's understanding of the natural and built environments, encouraging EE at tertiary level so that students can pursue careers, which are related to the environment and possible solutions, and promoting environmental literacy and a desire to care for and wisely manage resources for the benefit of present and future

generations are additional methods. Thirdly, encouraging outdoor activities, which boost public environmental literacy and encourage students to pursue environmental careers, training more teachers on EE at every level of schooling, creating an agency for the preparation of environmental impact statements (EIS), and ensuring that environmental protection becomes an integral part of development are also necessary. Finally, encouraging environmentally friendly modes of behaviour and forcing polluters to pay for their negative impacts can also improve society's attitude towards the environment.

2.5. The EE Curriculum and its Components

According to Palmer (1998), the EE curriculum consists of three inter-related dimensions, namely: **about**, **through/from** and **for** the environment. The aim of the first one is to discover information or facts about the environment in order to enrich the mind (*cognitive goal*). In the second dimension, the environment is used as a resource in two ways: as a medium of instruction (*enquiry* and *discovery*) and as a source of materials for the learning process. On the other hand, education for the environment is geared towards the development of an informed concern for the environment. This includes the development of behaviour change, which shapes perceptions, attitudes and actions leading to '*a personal environmental ethic*' (Palmer, 1998:137). A comparison of the above approaches is made later in this chapter.

 According to Palmer (2003), there are nine elements of an EE curriculum. The first one is knowledge of the environment and its potential for human use. Arts, Science and Geography can inculcate a sense of environmental awareness and responsibility. Secondly, a theoretical and potential knowledge of appropriate technology and its role in SD is also necessary. The third element is knowledge of the history and nature of a global society and factors, which discourage SD while the fourth one is an understanding of environmental politics at national and global levels. Political literacy, which enables students to analyze factors, which govern the global economy and have a bearing on the plight of the environment, is another important element. On the other hand, exposure to social education, which enables students to see the need for SD in the presence of

contradictions, which prevail in the modern world system, should not be excluded from the curriculum.

Other elements include: an understanding of popular culture and its negative impact on the environment (ideology and consumerism), involvement in projects aimed at promoting SD, and inculcating a sense of hope for the future without indoctrination. She also outlines the goals of education for sustainability as: enabling people to understand the inter-dependence of all life on earth and the negative effects of some actions and decisions on the environment and available resources, informing people about the various factors (economic, political, social, cultural and environmental), which undermine or promote SD, equipping people with knowledge, skills, attitudes and values, which enable them to participate in SD at local, national and global levels while enabling them to integrate environmental and economic decision-making and exposing them to the inter-disciplinary approaches of EE and the need for integration of concepts of SD across the curriculum divisions.

According to Palmer (1998), before they can make informed judgements about the environment, learners should acquire knowledge of: natural environmental processes, human impacts on the environment, and past and present environments. They should also be familiar with environmental issues such as: the greenhouse effect, acid rain and air pollution and have knowledge of environmental laws at local, national and global levels and how policies and decisions about the environment are made. How individuals, groups, communities and nations inter-depend with and on the environment, conflicts about environmental issues and how past decisions and actions have affected the environment, are also necessary. Finally, the importance of planning, design and aesthetic considerations and the need of effective action to protect and manage the environment are also important ingredients.

They should also develop communication, numeracy, study, problem-solving, personal, social and information technology skills. An essential aspect of EE is the creation of positive attitudes to the environment as shown by: appreciation, care and concern for the

environment and its ecosystems, inter-dependence of thought on environmental issues, respect for diverse beliefs and opinions, tolerance and open-mindedness, and respect for evidence and rational argument. Some of the topics included in EE curricula are: Climate, soils, rocks and minerals, water, resources including: energy, plants, animals, people and their communities, buildings, industries and work (Palmer, 2002). Curricula also contain empirical, synoptic, aesthetic and ethical elements.

Empirical elements refer to aspects of the environment, which can be used for demonstration, measurement and analysis for the benefit of learners. Synoptic aspects enable them to see the complexity of environmental issues while aesthetic components reveal the qualitative nature of environments. Finally, ethical elements encourage students to develop personal responsibility and stewardship towards the environment. These four elements are closely linked to the three dimensions of EE mentioned previously (about, from and for the environment) and together constitute a model (integrated whole) that has been used to build EE curricula in various parts of the world (Palmer, 2002). The term *curriculum greening* has been used to refer to the development of a sound and well balanced EE curriculum with a wide range of issues included in it (Manjengwa, Price and Stiles, 1999).This has been the goal of many countries, which have adopted EE policies.

2.6 A Comparison of EE Approaches

Three approaches to EE were mentioned previously in this chapter, namely: Education **about, through/from** and **for** the Environment. By far the oldest and most common form of EE is **about** the environment. According to Fien (1993, 15) it lays emphasis on

"*knowledge about natural systems and processes and the ecological, economic and political factors that influence decisions about how people use the environment. Knowledge of the interactions between natural systems and social systems is considered an essential requirement for resolving local, national and global environmental issues and for managing the environment responsibly*".

In secondary schools, it is included in subjects like Geography, Science and Agriculture. It lays emphasis on ecological concepts and possible solutions to environmental problems. However, Fien (1993, 15) criticizes it for neglecting "*human causes and of the changes in social systems necessary for solving them*". On the other hand, Education **through/from** the Environment is based on the learner's experiences, which are used as a medium of education or instruction (Palmer, 1998). Through direct contact with the environment, students develop sensitivity for the former. They acquire skills such as data collection, field observation, drawing sketches, photography, interviews, questionnaires, data analysis and interpretation. Education **for** the environment, on the other hand, seeks to:

"*promote lifestyles that are compatible with the sustainable and equitable use of resources. In so doing, it builds on education **about** and **through** the environment to help develop an informed concern for the environment, a sensitive environmental ethic, and the skills for participating in environmental protection and improvement*" (Fien,1993:16).

It challenges contemporary attitudes, values, lifestyles and practices and their negative effects on the environment with a view to changing them. It can be argued that education **for** the environment has the greatest potential to lead to behaviour change among students thereby re-shaping cultural attitudes and lifestyles (Fien, 1993). If these values spread through society as a whole, sustainability ethics can be achieved in the long run.

2.7 The relationship between EE and ESD

At the beginning of the new millennium, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) declared the period 2005 to 2014 as the Decade of Education for Sustainable Development (ESD). According to Le Grange (2008, 207), there was a '*call for humans to live more sustain-ably and for development to take place in more sustainable ways*'. In other words, this new concept was designed to enable

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societies to achieve the goals of SD, which EE had failed to do over the years. Shumba, Kasembe and Mukundu (2008, 94) claim that

'*ESD tackles the problems of poverty and its connection to malnutrition, health, HIV/AIDS, food security and to the fulfilment of human rights, in addition to the focus on ecological relations and livelihoods. Education for sustainable development seeks to avert the unsustainable use and consumption of natural resources that disrupts natural environments and intensifies poverty. Reducing poverty, improving health and maintaining ecological structures is expected to improve quality of life. If central sustainability issues are included as topics in the formal and non-formal education of children and adults…then they would understand and take steps to tackle land degradation, illegal mining, risky sexual behaviours, and the loss of family values…*'

However, since its inception, ESD has been criticised for being mere rhetoric or sloganeering as it does not add anything new to the older concept of EE. For example, Sauve (1996:8), claims that ESD

'*does not seem to add new objectives or principles to EE, or to propose a different educational approach. The characteristics of (ESD)… are the same as those of EE identified by Hart (1981) and the United Nations Educational , Scientific, and Cultural Organisation… holism, inter-disciplinarity, value clarification and integration, critical thinking, issue based and action learning, etc*'.

Two arguments have been made in support of ESD according to Sauve (1996). Firstly, there was a conception that EE was focusing too narrowly on the protection of natural environments (for their ecological, economic or aesthetic values), without taking into account the needs and rights of human populations associated with these same environments as an integral part of the ecosystem' (Sauve, 1996,8). Secondly, there was also a need to update the EE discourse so as to match it with global economic realities and solidarity. It is doubtful whether these arguments are strong enough to justify the introduction of ESD as an alternative for the older concept of EE.

The concept of SD dates back to1713 when the term was coined to refer to German forestry (Le Grange, 2008). However, it was not until 1972 that it became part of English vocabulary. Since the publication of the Brundtland Commission Report in 1987, it has gained global currency to refer to 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs' (Le Grange, 2008: 208).

On the other hand, Sauve (1996) identifies six conceptions of the environment, which are associated with EE: environment as nature (to be appreciated and respected), environment as a resource (to be managed), environment as a problem (to be solved), environment as a place to live in (to know and learn about, to plan for, to take care of), environment as the biosphere (in which we all live together, into the future), and environment as a community project (in which to get involved). She goes further to describe three educational paradigms that are found in EE discourses. The first one is the rational educational paradigm, and industrial socio-cultural paradigm, which lays emphasis on production, productivity, economic growth and cooperation. This approach encourages students to memorize facts on environmental issues and to compete with their peers for the best performance.

The second one is the humanistic educational paradigm, which is linked to the existential socio-cultural model. It is an approach that encourages personal intellectual growth based on individual desires and potential. Students are encouraged to respect nature and harmony. The approach is characterized by many nature education and value activities given to students. Finally, there is the inventive educational paradigm which focuses on the symbiotic relationship between human beings, society and nature. It encourages the construction of knowledge and the development of useful actions. It also seeks to promote the production of new educational practices, for example making school more open to real life, cooperative work and problem solving.

According to Sauve (1996), EE has a close relationship with SD, which can be viewed in several ways. Firstly, some view SD as the ultimate goal of EE. Hence, this led to the coining of the term ESD. Secondly, others feel that specific objectives of SD should be added to those of EE. As a result, they use the expression education for environment and sustainable development. Thirdly, some argue that that the term EE implies ESD. Hence there is no need to change the terminology. Finally, others claim that the debate concerning EE and ESD is likely to continue in the future and this should be encouraged at global level.

Following a study, which they conducted in three Australian schools, Campbell and Robottom (2008, 205), argue that ESD has not made any significant impact on SD issues compared to EE hence they claim that it is just a slogan as the following quotation shows:

'*There is a danger that SD will not lead to an improvement of environment-related education in schools. This is the lesson from environmental education-that when there is a slogan system operating, there is every chance that change will be symbolic only. The language itself will enable a continuity of established practice: resources will be expended, careers developed, associations formed, journals filled-and environment-related practice will not necessarily change for the better*'.

They conclude that ESD is not likely to make a difference on SD issues at global level, a view that is held by other researchers (Sauve, 1996; Le Grange, 2008).

2.8.0. Application of EE/ESD concepts at global level

The birth and growth of EE was a remarkable achievement at global level. This is because it took only a decade from the introduction of the term '*environmental education*' in the UK in 1965 to the convention of a global conference on this new branch of education. Over the years, many countries throughout the world have adopted EE as an integral part of their educational curriculum. This section examines case studies from Australia, Canada, China, UK and USA, Kenya, Uganda, Botswana, RSA, Tanzania and

Zimbabwe. While the first five countries give a global perspective of the application of EE and SD concepts, the rest of the case studies provide an African picture on this issue.

In general, EE seeks to achieve five main goals, which, according to Panneerselvam and Ramakrishnan (1996) include: a*wareness*: to help social groups and individuals acquire an awareness of and sensitivity to the total environment and its allied problems, k*nowledge*: to help social groups and individuals gain a variety of experiences and acquire a basic understanding of the environment and its associated problems, and a*ttitudes*: to help social groups and individuals acquire a set of values and feelings of concern for the environment and motivation for actively participating in environmental improvement and protection. *Skills* help social groups and individuals to acquire the skills for identifying and solving environmental problems while p*articipation* provides social groups and individuals with an opportunity to be actively involved at all levels in working towards the solution of environmental problems. As mentioned previously, EE cuts across all educational levels including: primary, secondary and tertiary and seeks to influence the values, attitudes and behaviour of the public in general.

2.8.1. EE in Australia

Australia has made remarkable progress in the field of EE over the years. During the 1970s, it was still in its infancy. However, during the 1980s it experienced a boost as it became '*more highly organised internally…with the formation of its own national professional association, which has grown from strength to strength with significant presence in each state and territory*' (Robottom, 1998:169). At national level, the school curriculum has been centralised without ignoring the local needs of each school or state. In addition, EE in Australia goes beyond ecological considerations to explore the cultural, social, political, ethical, moral, emotional, philosophical and economic dimensions (Palmer, 2003). This has enriched it to a point where it is now a role model at global level.

According to Robottom (1998, 170), the Australian EE Programme

'*recognizes that educating about environmental issues entails considerations of not only what is the case, but also what should/ought to be the case*'.

Colleges and universities have been involved in training students at various levels of tertiary education. Some universities offer post-graduate degrees (Masters and PhDs) in EE and Environmental Science courses. Much of the credit for this progress goes to the Australian Association for EE, which was established in 1980. In 1998, it had a membership of 500 and performed several functions, which included: encouraging research through the sponsorship of an annual professional journal on EE, holding national conferences and producing newsletters, offering in-service EE training to teachers, and collaborating with each state or territory to produce EE policies (Robottom,1998). The Australian Association for EE has created a conducive environment for the development of positive attitudes to the environment. For this reason, EE in the country has a bright future since it promotes a spirit of environmentalism among ordinary citizens. This has a direct impact on behaviour change, which is the main goal of EE. According to Robottom (1998:171):

'*There are many instances in Australian environmental education where teachers and learners have formed strong working relationships with a range of community agencies and groups, no doubt in part with a view to attracting human and financial resources from these non-systemic sectors*'.

Australia has also produced internationally renowned researchers, whose contributions are very crucial in the development and conceptualisation of EE at both national and global levels. According to Palmer (2003), they include: John Fien (Griffith University), Ian Robottom (Deakin University), David Yencken (University of Melbourne), Roy Ballantyne (Queensland University of Technology), and Rob Walker (Deakin University) Other prominent environmental educationists in Australia include: Annette Gough, Noel Gough and Jo-Anne Ferreira.

2.8.2. The Canadian EE Experience

Just like Australia, Canada has made remarkable strides in the development of EE. These developments can be traced back to the 1960s when subjects such as: nature study, natural history, conservation education and outdoor education were taught in schools (Hart, 1998). During the 1970s, international conventions held in Stockholm (1972), Belgrade (1975) and Tbilis (1977) helped to increase public interest in EE issues (Palmer, 1998). Until the end of the 1980s, most Canadians associated with the North American Association for Environmental Education, which was based in the USA. However, during the 1990s, the Canadian Network for Environmental Education and Communication (EECOM) was established. Since then it has stimulated the development of more public interest in EE.

According to Hart (1998:174) '*environmental education has evolved through the 1980s to become everyone's concern in the 1990s*'. The impact of this development is reflected by several developments such as the introduction of some new courses in Canadian universities, which has generated public interest in EE. Secondly, Canada's Green Plan, a comprehensive national commitment to clean up and protect the country's environment has a similar effect. Thirdly, the establishment of National and Provincial Roundtables on the Economy and the Environment (NRTEE) in 1993 resulted in increased EE activity and conservation work throughout the country. Fourthly, the Environmental Citizenship Programme for primary and secondary schools indicate government support for EE issues since 1993.

Furthermore, most provinces provide guidelines for the integration of EE concepts into existing subjects while the increase in research activity on EE reflects academic interest on these issues. Finally, EE has exerted a strong impact on the Canadian society in general leading to behaviour change among the public. This is a key goal of EE, which should filter down to ordinary people or citizens. This has been achieved as shown by Hart (1998, 176), who claims that '*many teachers of Canadian young people…have*

transformed their thinking about how the world works and are transforming the consciousness of the next generation'.

2.8.3. EE Policy in China

China is the most populous country on earth, with over a billion people during the last decade (Palmer, 1998). As an emerging industrial and economic giant, its impact on the natural environment is tremendous. Although industry employs only 18% of the total labour force, it contributes far more to the whole economy (Cannon and Jenkins, 1996). Heavy industry, for example, produces machinery, equipment, steel, chemicals and machine tools for both domestic consumption and export. The country's heavy dependency on coal in particular is a cause for concern from an environmental perspective. Fossil fuels are notorious for carbon dioxide and carbon monoxide emissions, major causes of the greenhouse effect plaguing the earth today (Miller, 1994). According to Howard in Cannon and Jenkins (1996) Chinese industries consume more than 50% of coal, oil and gas and 75% of the electricity generated in the country. Due to their inefficiency, the country's industries are notorious for too much energy consumption and the inevitable pollution of the environment.

EE in China dates back to the early 1970s when it was introduced in the country's tertiary institutions (Cannon and Jenkins, 1996). Between 1973 and 1978, major universities introduced courses in environmental studies in order to develop skilled manpower in these fields. By 1995 there were 79 tertiary institutions, which were involved in 15 different environmental programmes offered at undergraduate level. They covered various disciplines including: science, engineering, agriculture, medicine and education. Some 107 centres offered masters while 38 offered doctoral degrees. The main thrust of these tertiary institutions is to train students to solve problems such as: waste disposal, pollution and land degradation. As a result fieldwork exercises are an integral aspect of the teaching and learning process.

Some of the courses have been taught at undergraduate level. For example, in Chemistry environmental chemistry and pollution chemistry are offered while in Biology pollution and living things and environmental sanitation are taught. While in Geography, it is natural conservation and protection of resources in Political Science, environmental management and environmental law are offered. Finally, in Language and Literature, environmental literature is taught. The ultimate goals of this approach are: to broaden the environmental knowledge of students in various disciplines, to strengthen their environmental awareness and to develop their appropriate environmental values and attitudes (Cannon and Jenkins, 1996) .

Since 1992, some universities have been offering environmental education courses to both undergraduate and post-graduate students. The aim of such courses is to equip prospective teachers with theoretical knowledge of environmental education. Following China's 1979 national conference on the issue, EE was introduced at primary and secondary levels. The main teaching approaches, which have been employed over the years include: problem-solving, experimental, field study and simulated approaches. Chinese policy promotes environmental awareness among the general public with a view to solving problems encountered at local and national levels. However, it is taking place within an economy, which is highly dependent on fossil fuels such as coal, as mentioned previously. Hence, it is not likely to lead to significant changes in the behaviour of the society in general (Canon and Jenkins, 1996).

2.8.4. The UK Experience

In the UK, by 1979 an EE curriculum had been designed for primary, secondary and tertiary institutions. It included the formulation of objectives to be achieved during learning processes. For example, at primary level, EE involved:

pupils in personal experience of the environment by direct exploration with all their senses, using the school and its immediate surroundings and going further afield when

*necessary… Children (were also) introduced to the statutory and accepted codes of environmental behaviour (*Palmer, 1998, 14*).*

During the 1980s, a national curriculum for schools had been consolidated and was functional at all levels. By 1987, the principles, which had been formulated in the Tbilisi Convention, had been endorsed. In 1988, the European Community (EC) adopted EE as an 'integral and essential part of every European citizen's upbringing' (Palmer, 1998, 16). The aim of EE was to increase the public awareness of environmental problems and their possible solutions. However, the achievement of this goal depended on several guiding principles such as: the environment is a common heritage of mankind, the common duty of maintaining, protecting and improving the quality of the environment, as a contribution to the protection of human health and the safeguarding of the ecological balance, the need for a prudent and rational utilisation of natural resources, and the way in which each individual can, by his own behaviour, contribute to the protection of the environment.

It was envisaged that by the age of 16, all pupils in the UK should have acquired EE knowledge ranging from local to global in scale. This, according to Palmer (2003) would enable them to acquire several skills and attitudes. Firstly, they would understand the natural processes, which take place in the environment, including the ecological principles and relationships that exist there-in. Secondly, they would be aware that human lives and livelihoods are totally dependent on the processes, relationships and resources, which exist in the environment. Thirdly, they would know the impact of human activities on the environment, understand the process by which communities organise themselves, initiate and cope with change, appreciate that these are affected by personal, economic, technological, social, aesthetic, political, ethical and spiritual considerations.

They would also be competent in a range of skills, which help them to appreciate and enjoy, communicate ideas and participate in the decision-making processes, which shape the environment. Furthermore, they would view, evaluate, interpret and experience their surroundings critically so that a balanced appreciation can be reached. They would also

have insights into a range of environment and cultures, both past and present, to include an understanding of the ways in which different cultural groups perceive and interact with their environment. Another skill is to understand the conflicts that may arise over environmental issues, particularly in relation to the use of resources, and to consider alternative ways to resolve such conflicts. They would be aware of the interdependence of communities and nations and some of the environmental consequences and opportunities of these relationships. In addition they would know that the current state of the environment resulted from past decisions and actions and that the future of the environment depends on contemporary actions and decisions to which they make a contribution. Finally, they would identify their level of commitment towards the care of the environment.

A survey of various schools in the UK shows that EE is taken quite seriously in the curriculum. It is integrated in the sciences and geography and is reflected in the aims, principles and teaching strategies at each school. At Newton Infant School in England, for example, EE seeks to achieve the following basic aims, according to Palmer (1998), develop the knowledge, understanding and skills necessary to discuss environmental issues, enable students to understand the world and the part natural resources play and the possibilities of protecting and managing environments, examine and interpret the environment from a wide variety of perspectives, and develop an awareness and curiosity about the environment and be actively involved in resolving environmental problems. While coordinators are drawn from science and geography, principles and strategies of teaching EE are also clearly stated in scheme books. Plan books also reveal progress and continuity in the teaching of the concept.

Beancross Primary School in Scotland is another example. Firstly, it helps pupils to develop positive values and attitudes by raising their awareness and developing self-respect, consideration, honesty and self-discipline. Secondly, it develops pupils' respect towards property, other people and living things and encourages them to see things from other viewpoints. Thirdly, it enables pupils to appreciate and develop an awareness of the total environment in which they live and their responsibilities for events and

consequences. Finally, it helps pupils to realise that everyone is important and can play a very positive role in changing things for the better.

The school has developed an action competency model, which it uses to evaluate the effectiveness of its teaching and learning strategies. The model comprises four items namely: Knowledge/Insight, Commitment, Visions and Action/Experiences. The British System of education can be credited for integrating environmental education in some subjects namely geography and the sciences. Since EE runs through all levels of education, it is likely to have a strong impact in shaping peoples' levels of environmental awareness as well as their attitudes and perceptions. In the long run, it is likely to create citizens who are more responsible in the protection of the environment.

2.8.5 EE in the USA

There is no general consensus among researchers about when the USA first adopted EE as a national strategy. Some claim that it started during the 1890s, with a focus on Nature Study while others argue that it emerged during the 1920s with an emphasis on outdoor education. Yet some believe that it dates back to the conservation education movement of the 1930s (Disinger, 1998). However, during those early days there was a lack of common focus or broad acceptance among the environmental educationists (Palmer, 1998). The 1960s ushered in a new public sentiment concerning environmental quality and its impact on human health and environmental systems. This generated a new thrust, focusing on education for the environment, with an emphasis on responsible environmental citizenship.

The US federal government passed its first legislation on EE, namely the National EE Act of 1970, which became a rallying point for all those who had an interest in EE. However, during the 1980s, the Act was repealed and EE programmes had to survive without government funding. Each local community had to be self-reliant in spite of the fact that EE enjoyed general public acceptance in mainstream educational circles. However, this situation was reversed during the following decade with the introduction of

the new National EE Act of 1990 when government funding was renewed. The US EE programme is unique in that each of the 50 states makes its own decisions on the nature of its programmes. At national level, however, most of the leadership in EE has been drawn from various professional organisations such as: the American Nature Study Society, the Outdoor Education Association, the National Association for Interpretation, the Conservation Education Association and the North American Association for EE. Formed in 1971, during the 1980s, the latter association expanded its mandate to cover the whole of North America.

According to Disinger (1998), EE programmes in the USA exhibit several features including: varying mixtures of Nature Study, outdoor education and conservation education. They are also characterised by science and aesthetics and are also marked by objectivity and subjectivity. Furthermore, they have a mixture of environmentalism in various forms and lack a common definition at national level. Due to these characteristics, the US EE programme has been criticised for being weak since it lacks a strong scientific base. Consequently, it fails to address the economic realities of the country. The preaching of unfounded environmentalism in the context of a highly materialistic society is viewed as hypocritical as it cannot change the behaviour of an over-consumptive society. Finally, its diversity from one state to another leads to a lack of uniformity in its implementation at the national level.

Together with China and India, the USA has always refused to be bound by the Kyoto Protocol of 1997 and its subsequent versions such as the Durban (RSA) Climate Change Conference of December, 2011 (*French TV Channel*, 12/12/2011). Some 194 countries were represented at ministerial level and several resolutions were made at the conference, such as: the endorsement and extension of the Kyoto Protocol to 2017 and the approval of the Durban Treaty in 2015. Countries would be expected to fully implement the Durban agreement within ten years. Some US$100 billion would have to be raised for climate change mitigation in developing countries. However, it was not clear where the funds would come from.

It is ironical that China, India and the USA, the worst carbon emitters were not willing to be bound by the Durban Treaty. However, it is hoped that in the face of increased pressure from the global community, the USA, China and India will revise their attitudes to the global environment through a change of their national policies. They can take a cue from those industrialised countries such as the UK and Germany, which have already reduced their carbon emissions as mentioned previously. Their EE programmes will also have to change and improve in line with global trends (Disinger, 1998).

2.8.6 Factors influencing the effectiveness of EE and SD programmes at global level

From the above case studies, it would appear that countries, which have made significant progress in EE such as Australia, Canada and the UK, have several common characteristics. The first one is the existence of strong Green Political Parties or organizations, which lobby for environmental protection. The second one is political will. Governments should abide by international agreements on environmental issues (for example, the Kyoto Protocol of 1997), as a sign of commitment. Thirdly, societies, should be sensitive to the plight of the global environment and be prepared to sacrifice their materialistic goals for the common goal of environmental protection.

On the other hand, those countries with weak SD goals (including China, India and the USA) are not likely to succeed in their EE goals due to the prevailing conditions in their societies. These include governments, which prioritize economic progress at the expense of environmental issues and are also the major polluters and carbon emitters in the world. Such countries refuse to abide by the terms of the Kyoto Protocol, and their materialistic societies resist changes in their lifestyles (for example USA). Although China is a communist country, it is rapidly acquiring capitalist values of materialism and is catching up with the West in terms of its general culture. Its heavy dependency on coal has made it a major carbon emitter at global level. In the light of these observations, it would appear that the effectiveness of EE programmes in a country is strongly influenced by its political will, economic interests and the general lifestyle of its citizens. The same factors undermine SD programmes at global level (Miller, 1994).

2.9.0. The East African Experience

This section examines two case studies in East Africa before moving on to the SADC region where Zimbabwe is located. Kenya and Uganda are among the most dominant economies in East Africa and have made some progress in the implementation of EE (Palmer, 1998). In general, EE programmes in Africa as a whole have been undermined by weak legislation on SD/EE issues and poverty, which forces people to use resources directly from the environment as a source of livelihood (Otiende, 1997). This is in sharp contrast with industrialized nations where the bulk of the populations depend on manufacturing industries, tertiary and quaternary sectors for their survival.

2.9.1. The Case of Kenya

From 1975 onwards Kenyan tertiary institutions such as colleges and universities began to incorporate EE in their curriculum (Otiende, et al, 1997). One of the notable examples was the Kenyata University as it was known then. Several environmental topics were included in teacher training colleges. By 1990 plans were underway to create the first Faculty of EE in Africa. In Kenya, two approaches have been employed in the teaching of EE. One is integrated within the existing school system and the other one focuses on university education. Both approaches are supported by government and international organisations such as UNEP, IUCN and the World Conference of Organisations of the teaching Professions (WCOTP). In its implementation of EE, Kenya has encountered several problems especially at secondary schools and in tertiary institutions.

The problems include: lack of appreciation of the importance of EE in general and shortage of adequately trained teachers. Too little time is given to EE in congested time table schedules. Insufficient educational materials, under-funding of EE programmes, and inadequate opportunities for field studies also undermine teaching and learning activities. In the non-formal education sector, just as in other African countries, various NGOs have been involved in EE programmes. Their aim is to educate the public on environmental

issues with a view to influencing people's attitudes and perceptions. It is hoped that they will in turn lead to behavioural change among the ordinary people. Once this is done, environmental protection as a goal will also be achieved.

2.9.2. EE in Uganda

Uganda has a fairly long history of EE, which dates back to the 1960s when it was taught in primary schools as Nature Study (Palmer, 2003). However, the more recent concept of EE and creating public awareness is quite new. It dates back to the mid-1980s (following political stability) when the country started paying attention to environmental problems. Some of these problems included: soil erosion and land degradation, pollution, deforestation, loss of biodiversity and environmentally related diseases such as cholera, bilharzia and malaria. Since 1987, a major curriculum reform occurred in the primary school syllabus. Some aspects of EE were incorporated and have been taught at all levels of basic education in Social Studies (traditionally history and geography). EE has also been incorporated at secondary and tertiary levels including universities.

In Uganda EE has been defined as:

"*the process of recognising values and clarifying concepts in order to develop the skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings*" (Palmer, 1998:222).

This definition is based on the first international convention of EE, which was held in 1970. Traditionally, there was no public policy to guide or support EE at any level of formal education. However, since 1992 EE has been incorporated in formal, informal and non-formal systems of education. In 1995, the government established the National Environment Management Authority (NEMA) whose mandate has been to integrate EE in the school curriculum. It is also empowered to promote public EE through formal, non-formal and informal education systems. During a national workshop that was held in 1995, the Uganda National Environmental Education Association (UNEEA) was formed.

Its goals, according to Palmer (1998) were to: influence the incorporation of EE into the formal education system, promote professional needs and activities of environmental educators, review, formulate and disseminate EE curricula, and to coordinate EE research activities in the country.

Over the years, EE has been incorporated at pre-school, primary, secondary and tertiary levels. At pre-school level, children are enabled to develop the right attitudes towards the environment. At primary school level, EE is incorporated in science and social studies. In secondary schools, it is taught in geography, agriculture, chemistry, physics and biology. However, the examination system does not lay much emphasis on it. This is a fundamental weakness. At tertiary level, there is a lack of co-ordination among disciplines and EE lacks the emphasis it deserves.

On the whole, EE in the formal education system is hampered by the lack of a clear policy, funds and trained human resources. Outside formal systems of education, EE is conducted by NGOs, both indigenous and international. Examples of indigenous NGOs are the Wildlife Clubs of Uganda and Harmony. However, these organisations face challenges such as: lack of funding, skilled personnel, resources and equipment. At national level, EE is also hampered by the lack of well-funded research. But in spite of these problems, Uganda has made more progress in EE than some of its counterparts in Sub-Saharan Africa.

2.10.0 SADC EE Programmes

Since Zimbabwe is part of the SADC region, it is essential to examine how this regional grouping has attempted to implement EE. This information sheds more light on the country's progress in the implementation of EE. In spite of their diversity, SADC countries share some common characteristics in their EE programmes. These similarities can be ascribed to their colonial histories. The SADC IUCN Report (1999: 4) claims that:

'*Environmental education in the SADC region has its roots in education for conservation, an approach that focused strongly on the preservation of the biophysical aspects of the environment in isolation, both geographical and academic, from the human context. Education for conservation was strongly shaped by the imported ideas about and system of education that forms part of our colonial heritage and in which scientific rationality is seen as the only basis for development and learning is strictly divided into disciplines and fields*'.

However, in more recent years, efforts have been under way to re-orient EE from this traditional approach to education for sustainable living. New EE policies are being developed in most countries even though the progress varies from one country to another. It is pertinent to note that '*Elements of "old school*" conservation education can be found in all countries and, indeed, have a valid role to play, but conscious efforts are being made to provide education which facilitates wise management of natural resources, empowers people to participate in decisions that affect their daily lives, and contributes to the quest for sustainable development' (*The SADC IUCN Report*, 1999: 4).

Since 2003, SADC has identified Environment and Sustainable Development as a priority intervention area as part of its economic development policy (*SADC Report, 2006*). An important strategy of the regional grouping is to strengthen EE so that sustainable environmental management can be realised in the long run. The region hopes to achieve several goals such as: promotion of environmental awareness in order to ensure SD, mobilisation and co-ordination of environmental and trans-boundary natural resource management programmes, assessment and reporting of trends in environmental conditions, ensuring mainstreaming of environmental and SD issues into all sect oral policies, programmes and activities at national and regional level.

In order to achieve the above objectives, a major task of the region is capacity building and providing formal and non-formal training programmes for SD. Education for sustainable development (ESD) is a global concept, which was developed some three decades ago by the UN under the umbrella of UNESCO. In 2002 the UN General

Assembly launched the UN Decade for SD (UNDESD). This would run from 2005 to 2014. The decade is viewed as an opportunity to achieve two goals, namely: integrating the principles, values and practices of SD into all aspects of education and learning, and encouraging behaviour change in order to create a more sustainable future in terms of environmental quality, economic viability and social justice for the present and future generations.

The UNESD has four main objectives according to *The SADC Report on ESD* (2006). Firstly, it seeks to facilitate networking, linkages, exchange and interactions among stakeholders in ESD. Secondly, it fosters an increased quality of teaching and learning in education for SD. Thirdly, it helps countries to make progress towards, and attain the Millennium Development Goals (MDGs) through ESD efforts. Finally, it provides countries with new opportunities to incorporate ESD into education reform efforts. However, the report shows that SADC countries face several challenges in their policy frameworks. One is the lack of vision at national level in terms of policy review and development. Another one is the inappropriate and inadequate laws to support environmental policy. There is also a need to institutionalise SD issues into education systems. Inadequate legislation and too much bureaucratic red tape restrict policy implementation. On the other hand, the lack of appropriate institutional frameworks also prevents interested organisations with similar objectives to work together.

These challenges have created numerous constraints, which undermine the successful implementation of EE programmes in the whole region according to Molapo (1999). All countries lack adequate personnel (educators) trained in the teaching of EE. However, in more recent years some efforts have also been made to develop manpower in some tertiary institutions as the following report shows.

'*Working in collaboration with UNEP and other partners, the programme participated in the training of 87 university lecturers from African universities under UNEP's ESD flagship programme, Mainstreaming Environment and Sustainability in African Universities (MESA), and provided leadership and support to this Africa-wide network of*

higher education institutions' (SADC Regional Environmental Education Programme Report, 2008: 8-9).

There has also been a lack of teaching materials and mechanisms to disseminate them while funds to implement EE programmes are scarce. In order to address this problem, since 1998, the SADC REEP has been producing newsletters (*print and electronic*), which share activities and experiences of EE practitioners in the region (SADC REEP Report, 2008). The letters provide insights into education and conservation issues. Poverty and hunger also undermine efforts, which are aimed at promoting EE since the environment is taken as a direct source of livelihood. Civil strife, which has occurred in some of these countries, has been an impediment in the implementation of EE programmes as funds are directed at reconstruction projects at national level.

Furthermore, structural adjustment programmes and political upheavals have diverted government attention away from EE programmes. Inter-sect oral competition for limited financial resources in the national budgets also reduces the capacity of governments to prioritise EE issues. In some cases, there is no agreement on which government ministry should be directly responsible for the provision of EE. The lack of cooperation between government departments and NGOs in the provision of EE is another challenge. Language differences among certain countries also hinder the smooth communication on EE at regional level, especially where official languages differ.

In the light of the above constraints, SADC countries have realised the need to remould their policy, legislation and institutional support for ESD during the start of the UNDESD (*SADC Report, 2008*). The new thrust emphasises the need to: re-orient education and training systems towards SD, and to broaden participation of society in addressing SD issues and challenges. To date, most SADC countries have made some progress in addressing issues such as: increased environmental degradation, increased health risk and the impacts of poverty. This has been done through education and training systems and community development programmes. The regional body recognises the multi-disciplinary nature of ESD and seeks to bring together various organisations into a

harmonious working relationship. Government departments or ministries, which deal with the Environment, Forests, Water, Wildlife and Minerals, establish some common ground for cooperative effort. They should also be prepared to work with some NGOs with similar interests if this goal has to be achieved.

2.10.1. EE in Botswana

Botswana has made huge strides in natural resource conservation (Mukute, Marange, Masara, Sisitka and Pesanayi, 2012). For example, it has prohibited the use of persistent organic pollutants and has embarked on renewable energy rural electrification. A decade ago, although the country did not have an over-all EE policy, its vision at national level was to create '*an informed and environmentally educated nation*' (Obol, Allen, and Bach, 2003:26). In both primary and secondary schools, efforts have been directed at infusing EE into the whole curriculum. Since 1996, in-service workshops have been launched in order to train teachers who provide EE in their schools. This followed the 1994 Revised National Policy on Education (RNPE), which '*mandated the introduction of environmental education across the curriculum. This implies that all teachers are expected to infuse it into their teaching*' (Ketlhoilwe, 2003:75). Teachers receive support in various ways including: in-service workshops, provision of resources and materials, support from education officers, heads of schools and departments, and efforts aimed at creating conducive working environments for teachers.

However, since its inception, EE in Botswana has encountered numerous challenges, according to Ketlhoilwe (2003). They include: lack of information from the Curriculum Development Unit, the prevalence of untrained teachers in the country, negative attitudes of teachers and lack of facilities. Since EE is not examined, neither teachers nor students take it seriously. Hence it is often viewed as an unnecessary burden to the curriculum. This is worsened by the fact that teacher's training colleges have not yet adopted it as part of their curriculum. Ketlhoilwe (2003, 79) claims that:

'*Many graduate every year without any exposure to environmental education…It would seem that environmental education is not well developed within the teacher education structures in Botswana yet*'.

In the light of these observations, the same author makes several recommendations, which are aimed at improving the situation at national level. Firstly, there is a need to make EE examinable within the context of fusion across the curriculum. This would ensure that it is taken seriously by teachers and students. Secondly, the intensification of in-service training for teachers, heads and education officers is another solution as it would improve knowledge on the subject. Thirdly, the provision of guidelines especially for secondary schools would enable teachers to interpret the requirements of the RNPE policy for EE.

Promoting the status of EE in schools for example through the creation of posts for enthusiastic EE teachers would also be a positive development while creating an effective monitoring mechanism for EE in all schools would be another incentive. On the other hand the production of teaching materials for EE, conducting research on the development of teaching methods, which are geared at improving people's attitudes towards EE and designing an EE policy that is more workable and implement-able than the present one are also possible solutions. In the light of the above facts, it is clear that Botswana has a long way to go before it develops an effective EE programme at national level.

In a more recent study Ketlhoilwe (2007) has identified the current challenges which teachers in Botswana face in their attempts to teach EE. They include: poorly designed curricular, the lack of teaching resources, inadequately trained teachers and contextual problems such as school management, language and school-community relationships. The first three problems are due to the failure of curriculum designers to involve teachers in the design of syllabi. As a result, the product is neither pupil-centred nor teacher or user friendly. Unless these problems are addressed, EE in the country will never yield its intended outcomes. However, it is hoped that the newly established Masters in

Environmental Education (MEd) programme at the country's only university will address the manpower problems identified above.

2.10.2 South African EE programmes

South Africa is the most industrialised country in Sub-Saharan Africa and is an economic giant in the SADC region (Mukute, et.al, 2012). However, due to its heavy dependency on fossil fuels such as coal, it is ranked as the 12[th]greatest emitter of carbon at global level (*SABC NEWS International, 12th December, 2009*). In the RSA, EE dates back to 1982 when the first international congress was held at Mooi River (Palmer, 1998). However, a decade earlier the Wildlife Environment Society of Southern Africa (WESSA) had already shown its interest in EE through the launching of the Umgeni Valley Project in Natal in 1973. The aim of the project was to develop teaching materials for EE in the country and promote cooperation between formal and non-formal education sectors. Over the years, more organisations have embarked on EE projects. For example, the National Environmental Awareness Council (NEAC) involves teachers, children and youths in its annual EE programmes.

In the Mpumalanga Province, Ecolink also runs holistic EE programmes for the local people. As a result, many other community-based EE projects have emerged in the province. Before the Wildlife Society launched its projects, EE was confined to conservation education. The public simply viewed it as '*the wise management of natural resources and basic ecology*' (Palmer, 1998:205). EE was considered to be a synonym for such concepts as ecology, outdoor education, biology, and nature conservation. This was a narrow definition since EE is a much broader concept, which embraces all of them.

Formal EE training courses were introduced at the former University of Bophuthatswana before spreading to Rhodes, Stellenbosch, UNISA and other universities. In the non-formal education sector, several EE centres also emerged. Their role has been to provide facilities to schools, which take part in their programmes. The idea of including EE in informal and non-formal education was first discussed in August 1993 at Dikhololo near

Brits. A total of 17 agencies were involved in the conference. They included education officials, political parties, student organisations, university representatives and interested individuals. Following the Dikhololo conference, the government issued a document, which outlined the aims of EE in the post-apartheid era.

The specific goals of teacher education in the country now include: enabling the prospective teacher to develop skills such as the ability to develop a sense of environmental responsibility in students and ensuring that the teacher is able to: identify areas of knowledge, such as language and EE, which can contribute to a cross-curricular, integrated approach to learning. At secondary school level, teachers should be able to: teach about environmental issues within the framework of their subjects and/or as a cross-curricular study. The above goals underscore the importance of EE in South Africa's teacher training policy. In the formal curriculum, an inter-disciplinary approach has been adopted. However, its full implications are still to be researched, considering that it is a major (carbon) polluter at global level (Palmer, 1998). In terms of ESD, the country has made more progress than its SADC colleagues.

Furthermore, it is '*the only southern African country with a Green Economy Plan and is also leading in terms of prevention-based waste pollution management…South Africa's GDP compares well with those of developed countries and it is therefore in a much stronger position to fund its own environment and sustainable development initiatives than other SADC Member States. In addition, South Africa gives priority to sustainable use of biodiversity*' (Mukute, et. al, 2012:35). This is due to its well developed tertiary education sector which includes some of the best universities in Africa. The country is also the headquarters of the SADC REEP, an organisation which is responsible for ESD research and publications in southern Africa. However, in spite of these advantages, the South African education system has not yet fully recovered from its apartheid past, which was discriminatory (Mukute, et.al, 2012). For example, most black schools in rural and urban areas are poorly resourced compared to white schools. On the other hand, there is a need to reform the whole education system so as to re-align it to ESD goals (Lotz-Sistika,

2005). This is because during the colonial and apartheid era EE was delivered in the form of conservation education as mentioned previously.

2.10.3. EE Programme in Tanzania

Although Tanzania lies in East Africa, it is also part of the SADC regional grouping. In 1994, it had a population of 31.3 million, which was projected to increase to nearly 85 million by 2025 at an average annual growth rate of 3.8% (Chenje and Johnson, 1994). According to Obol, et al. (2003), the country's EE programmes are guided by the National Environmental Action Plan of 1994 (NEP, 1994) and the National Environmental Policy of 1997. The development of a national EE strategy has been undertaken by the National Environment Management Council. At the same time a pilot project aimed at integrating EE into the curriculum has been executed by the national curriculum development centre.

At primary school level, EE is integrated into Social Studies, whose aims, according to Makundi (2003), include: to enable learners to explore the relationship between people and their environment, and to identify how a person understands, manages and uses the environment rationally, and to understand how the environment affects people and the measures taken by people to discourage destructive behaviour. EE policy in Tanzania was strongly influenced by the Rio Earth Summit of 1992. However, to date, it has not yet been adequately integrated into other subjects apart from Social Studies. This probably accounts for its little or no impact on learners even though teachers of EE have received some training. It should also be noted that Tanzania does not have a specific EE policy. A major problem identified more recently is the lack of '*political will and commitment to address environmental, sustainable development and education for sustainable development issues*' (Mukute, *et.al*, 2012:40).

Makundi (2003) makes several recommendations, which are aimed at strengthening EE implementation in schools. They include: training of curriculum developers and teachers on policy analysis skills, dissemination, monitoring and evaluating the curriculum, formulation of national EE guidelines, equipping curriculum developers and teachers

with effective learning approaches and methodologies, and the production of curriculum guides for EE. From the preceding discussion, it is clear that just like Botswana, Tanzania still has a long way to go before it can implement an effective EE programme at national level.

2.10.4 General characteristics of SADC EE Programmes

According to Molapo (1999) SADC EE programmes lack uniformity due to several factors including: diverse ecosystems, varying habitats, different cultures, diverse languages, varying educational and government systems, different economic circumstances, political instability and unrest, and varying stages of national development. Furthermore, different interpretations of EE/SD concepts also result in diverse EE approaches. Although SADC countries have adopted EE in their formal education systems, their approaches differ significantly at national and institutional levels (Table 2.1). It is also pertinent to note that EE within the region has evolved from conservation education to ESD (Lotz-Sisitka, 2005).

This shift in orientation implies that

'*education for sustainability within the SADC region is still mitigated against by lingering perceptions from earlier preservation or protection based education. While elements of this type of education (for example, study of pristine environments in national parks, conservation of endangered species, etc) still form strands of education for sustainability, throughout the SADC region and beyond the trend is towards moving from a narrower, more "biophysical" understanding of the concept of environmental education to a broader, more holistic vision that has at its heart the goal of sustainability. It is important that environmental education policy take into account the changing views of environmental education and the shifting of national priorities from conservation to sustainable living*' (Molapo, 1999: 14).

Another challenge that is facing SADC countries is the gap between policy and practice (Ketlhoilwe, 2007). For example, the existence of very good policies has not been

matched by practice on the ground. Molapo (1999, 19) further claims that '*In some instances the reason for the gap is not lack of will for implementation, nor the fact that the policy was designed without practice in mind, and is in essence, not implement-able. In order to derive maximum benefits from the existence of a policy, it is important that the policy is formulated with a view to implementation*'.

Table 2.1: Institutions, which offer EE within Formal Education in the SADC Region

Country	Pre-Primary	Primary	Secondary	Tertiary	Teacher Training
Angola	0	3	1	1	3
Botswana	0	1	3	1	3
Lesotho	0	2	2	0	3
Malawi	0	3	1	0	0
Mauritius	0	3	3	2	3
Mozambique	0	2	0	0	0
Namibia	0	3	2	0	2
South Africa	2	2	3	2	2
Swaziland	0	2	2	3	0
Tanzania	0	1	1	3	0
Zambia	0	1	1	0	3
Zimbabwe	0	3*	3*	2	3*

Source: Adapted from Molapo (1999, 13).

Key

*Environmental Science

The SADC IUCN Report (1999) exposes numerous constraints, which confront the region's ESD programmes. Firstly, the lack of trained EE/ESD personnel undermines most programmes in the region. However, this problem is being addressed by the SADC

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REEP, which is based in Howick (South Africa). Training programmes, which have been underway include: the involvement of professional development courses, a course development network and attachment programmes (SADC REEP Report, 2008). Secondly, most SADC countries lack teaching and learning materials due to poverty (Ketlhoilwe, 2007). While in some cases this may reflect real shortage, in others it is indicative of the failure to distribute them to their intended destinations. In both cases, urgent solutions are required. However, it should be borne in mind that the mere presence of teaching materials is no guarantee for effective implementation of EE in the region. Thirdly, the shortage of funds for EE programmes is another challenge in most SADC countries bearing in mind that governments and donors do not always give priority to environmental issues (Lotz-Sisitka, 2005). Fourthly, poverty is a major problem in most countries as it is both a cause and a consequence of environmental degradation (SADC REEP Report, 2008).

Civil strife, as in the case of the DRC and Mozambique can disrupt EE programmes remarkably. The SADC IUCN Report (1999, 15) claims that in such cases '*there is little room or political will for focusing on anything other than the ongoing struggle or immediate pressing necessities*'. Finally, language can be a barrier between some countries within the region. An example is that between Anglophone and Lusophone countries. Since most EE literature is in English, countries such as Angola and Mozambique face communication problems. There are no easy solutions to some of these problems.

However, since 1993 the SADC has embarked on the production of a '*range of training, materials development and networking opportunities were established, followed up with policy support work, and later by emphasis on research and evaluation after widespread request from practitioners in the sub-region*' (*SADC REEP Information brochure*, 2008). The region has also received funding from the UN bodies such as UNESCO. Teaching and learning materials have been developed by REEP. To date there are more than 2 500 entries in its database (*SADC REEP Information brochure*, 2008). Poverty is difficult to eradicate since it is widespread at both national and regional levels (Mandishona, 1996).

However, donors sometimes bring some aid even though it may not be in line with national needs. This is because most donors have interests which have nothing to do with environmental issues (SADC IUCN Report, 1999).

Molapo (1999) makes several suggestions for the creation of an enabling environment within these countries. Firstly, there is a need for the support of EE at ministerial level especially through funding of programmes. Secondly, there is a need for the inclusion of EE in various levels of teaching and training so that there is continuity in EE learning throughout the curriculum. Thirdly, establishing mechanisms for the formation of relevant partnerships between government and civil society would be another strategy. Fourthly, encouraging and facilitating participatory programmes would broaden the ownership of and responsibility for EE while EE policy can provide a framework on which other interested parties would establish EE programmes and strategies. Finally, encouraging the adoption of different approaches and methodologies in the teaching of EE would improve its appeal to learners.

2.10.5.0 The Zimbabwean Case

According to a recent survey, Zimbabwe is making remarkable progress in EE (Mukute, et.al, 2012). This is evidenced by the introduction of EE in agricultural training colleges, Environmental Science (ES) and Health Education at all levels in primary and secondary schools. It has also post-graduate training in Forestry Management and plans are underway to offer a Bachelor of Science Honours degree at the University of Zimbabwe. The National University of Science and Technology (NUST), offers a Bachelor of Science Honours degree in Environmental Health while Bindura University has just introduced Masters degrees in Forestry and Environmental Science, respectively (Mukute, et.al, 2012). Furthermore, Zimbabwe is one of the few SADC countries, which have adopted the '*polluter pays principle*' with reference to effluent and solid waste disposal (Nhamo, 2003).

However, in spite of these positive developments, the country is experiencing an environmental crisis which is due to socio-political, economic and ecological causes.

According to Mukute, *et.al* (2012, 43) '*The socio-political environment of the country has been unstable for about ten years since the turn of the century. This challenge has resulted in declining economic activity which has caused high unemployment levels, low GDP and increased poverty. The net effect of these contextual developments has been an increase in direct dependence on natural resources…and associated difficulties for environmental governance. It has also resulted in little funding and other resources*' being directed to the cause of environmental protection. The country's recent land reform programme has led to massive deforestation due to the activities of small-scale farmers who were settled in wooded areas (Bond and Manyanya, 2003). Consequently, droughts and land degradation have become major challenges in these areas. According to Mukute, et.al (2012) to date Zimbabwe's main capacity building challenges include: politics and good governance, financial resources and political will and commitment. This section examines Zimbabwe's EE programme from an historical perspective with a view to providing a holistic picture of events which have shaped it over the decades.

During the colonial era, EE existed in the form of *conservation education* as shown by *Nature Study*, a subject that was taught in all primary schools until the mid-1970s when *Environmental Studies* replaced it (Mapira, 2012a). According to Chikunda (2007: 161), in 1954 the Rhodesian government introduced science in primary schools in the form of *nature study* with the goal of raising '*awareness in learners of flora and fauna that were in need of protection*'. However, a review conducted by the CDU in 1974 found the syllabus to be irrelevant to the country. Consequently, in 1975, the Ministry of Education recommended the integration of history, geography, nature study and hygiene into a subject known as Environmental Studies, which was taught until 1981. In1982 Environmental Studies was split into two subjects, namely: environmental science (ES) and social studies (Chikunda, 2007). The ES syllabus covered 13 topics, which were clearly defined for each of the seven grades taught in primary schools. Its aim was to develop scientific concepts and skills in pupils through their involvement in practical activities.

During the colonial era, at village and community levels, *conservation awareness campaigns* targeted both black and white Rhodesians (Whitlow, 1988). The Natural Resources Board (NRB), a government department within the Ministry of Agriculture was responsible for these campaigns, which targeted three groups of people, namely: large-scale commercial farmers, black small-scale farmers in the so-called African Purchase Areas (APAs) and the black peasant farmers in the so-called Tribal Trust Lands (TTLs). During the post-independence era, *environmental management* in the country has been guided by the Environmental Management Act of 2002, the Bio-diversity Conservation Strategy of 1997 and the Environmental Impact Assessment Policy of 1997 (Obol, et.al, 2003).

The division of Rhodesia into different racial sectors undermined rural development integration at national level (Wekwete, 1991). Hence at independence in 1980 racial segregation was abolished in order to introduce a new political order. In primary schools, Environmental Studies continued until 1994 when Environmental Science took over. During the first decade after independence, the government pursued a Marxist ideology, which focused on education with production (Underwood, 1986). Although conservation was a priority as shown by the introduction of the tree planting day, it tended to take a somewhat back seat (Magadza, 1992). The NRB, which had been established during the colonial era worked in collaboration with the new National Conservation Trust of Zimbabwe in order to achieve its traditional goals of forging environmental awareness and conservation among the public (Whitlow, 1988).

This section discusses the main factors, which influenced the development of EE and later SD policies and strategies in Zimbabwe both before and after the country's attainment of independence and majority rule in 1980. They include developments in agriculture, mining, industry and urbanisation in general. By far the most important factor was that of land degradation, mainly triggered by farming activities in commercial and peasant farming areas (Whitlow, 1988). Consequently, more attention will be given to it in this section than the other factors.

a) *Land Degradation in former white commercial farmlands*

Southern Rhodesia (*now Zimbabwe*) was colonized by Cecil John Rhodes on the 12th of September 1890 as part of his dream to expand the British Empire from Cape Town (RSA) to Cairo in Egypt (Bulpin, 1968). During its early days, Rhodesia was governed by the British South Africa Company (BSAC). In 1923, the colony established itself as a sovereign state that was free from South African political influence (Mpofu, *et al*, 2009). Although one of the main reasons behind colonization was the dream of *a land of gold beyond the Limpopo River*, it soon became obvious to the settler community that this was an illusion and many Rhodesian whites resorted to agriculture for survival (Bulpin, 1968). Following the promulgation of the Land Apportionment Act in 1930, land expropriation from blacks was effected resulting in the restriction of black Africans (*who constituted 90% of the country's population*) to reserved areas, which were commonly known as Tribal Trust Lands (TTLs).

According to Kay (1977), these areas, which accounted for only 41.5% of the country compared to 40% of the land occupied by Europeans, accommodated the bulk of the black population, which by 1976 numbered 6 220 000 at national level. On the other hand, Europeans who constituted only 277 000 (4%) of the total population occupied 40% of the land. Although there were also 21 400 Asians and Coloureds combined, their land ownership levels were insignificant as most of them lived in towns and cities. On the other hand, 14.7% of the land was reserved for forestry and wild life while the remaining 3.8% belonged to individual black African farmers who were allowed to conduct commercial farming.

Most of Rhodesia's commercial farm land was owned by 6 000 white farmers. Whitlow (1988) provides a detailed account of the main causes, patterns and consequences of land degradation in both colonial and post-independence Zimbabwe. He also explains how they led to the development of environmental conservation programmes throughout the country. His book covers five aspects of land degradation in the country, namely: causes and consequences of soil erosion, history of the erosion problem, distribution of erosion, factors influencing erosion, and government responses to the problem.

In both colonial and post independence Zimbabwe, land degradation in white commercial farms was mainly caused by ignorance, malpractices and overstocking pressures. In an historical analysis of the problem, Whitlow (1988) identifies four phases in the evolution of human responses to the problem of land degradation, including: Phase 1: Trial and Error-pre-1931, Phase 2: Erosion Awareness-1931-1948, Phase 3 Conservation Farming 1948-1965, and Phase 4: Mixed Fortunes-post 1965.

Phase 1: Trial and Error, pre-1931

During this period, '*a combination of ignorance and neglect resulted in widespread erosion and limited progress was made in promoting basic mechanical protection of arable lands*' (Whitlow, 1988: ii). In 1913, the **Herbage Preservation Ordinance** was passed with a view to preventing the indiscriminate spread of veldt fires. Another problem, which had emerged was that of soil erosion along roads and cattle tracks leading to the formation of gullies. By 1921, soil erosion had become a major problem in many white commercial farms. Since the white settler farmers lacked experience in the management of tropical soils, the problems persisted for some years. For example, it was not until 1927 that government passed legislation in the form of the **Water Act** in order to restrict the use of hydro-morphic soils, which were under threat from maize farmers. As soil fertility declined in most farm lands, some farmers opened up new lands for cultivation. However, this was only a temporary solution as crop yields would eventually fall in the new lands.

Phase 2: Erosion Awareness, 1931-1948

Resulting from experiences gained during the 1920s concerning the problem of land degradation, the Rhodesia Agricultural Union organized a congress, which addressed the problem of soil erosion. According to Whitlow (1988, 5), '*A soil erosion committee was appointed to determine the main causes of erosion and to suggest remedial measures*'. Resulting from recommendations of this committee, the Minister of Agriculture later in

1934 effected the formation of soil conservation committees in Mashonaland and Matabeleland, respectively. As the first formal framework for communication between government and farmers, this was a land mark event in the history of resource conservation in the country. Through the assistance of irrigation engineers, farmers soon developed scientific methods of combating soil erosion in their areas. By 1938, at least 27% of farmlands around Harare, Lomagundi and Mazowe districts had been protected through contour ridges.

However, the problem of soil erosion in both commercial farming areas and the so-called TTLs continued to be a cause for concern, resulting in the setting up of a special commission in 1938. The aim of the commission was to investigate the problem of land degradation at national level. It also made recommendations on how to solve the problems it had identified. According to Whitlow (1988, 6)

'The Commission of Enquiry recommended that there was a need for specific legislation governing the uses of natural resources, the establishment of a Natural Resources Board to ensure compliance with this legislation and, finally, the appointment of local conservation committees to gain the support and co-operation of farmers in conservation measures. Following the acceptance of the commission report, parliament formulated and passed the Natural Resources Act in 1941.This act provided for the setting up of the Natural Resources Board (NRB) and determined its functions in ensuring effective implementation of the new legislation.

Although some white commercial farmers accepted these recommendations, others strongly opposed them, regarding the new act as '*unwarranted interference in their affairs. Many farmers considered the principles to be sound but had reservations about the wide powers of the NRB*' (Whitlow, 1988: 6).

In November 1941, the Natural Resources Board assumed duties for the first time, chaired by Sir Robert McIlwaine who had been the leader of the Commission of Enquiry some years earlier. During its early years, the NRB faced problems due to poor funding

and resistance from some white farmers. As a result, by 1944, only two local conservation committees had been established at national level. However, the situation improved considerably in 1945 due to improved government support especially after the end of the Second World War. This laid a foundation for more positive action to address the problem of land degradation at national level (Whitlow, 1988).

Phase 3: Conservation Farming, 1948-65

The year 1948 saw the creation of the Department of Research and Specialist Services (RSS), aimed at encouraging agricultural research, which would provide farmers with information on such matters as soil analysis. Later on, a Conservation and Extension Branch (CONEX) was incorporated into the RSS. However, by 1950 CONEX had become a separate department and its

'main functions were to advise on basic soil water conservation measures and to translate agricultural research into practice amongst commercial farmers. Previously, these functions had been carried out as peripheral duties by irrigation engineers and research staff. The establishment of CONEX coincided with a general appreciation that both mechanical protection and improved husbandry were needed to prevent erosion' (Whitlow, 1988: 6).

Several factors, which influenced the development of more sustainable methods of farming during the colonial era, have been identified (Whitlow, 1988). Firstly, was the cooperation between Intensive Conservation Area Committees (ICAs) and CONEX staff. ICAs was responsible for monitoring land degradation and encouraging conservation in farming areas. Secondly, the establishment of the Henderson Research Station in the Mazowe area provided a more scientific framework of resource conservation, with its emphasis on experimental work. Thirdly, the extension of aerial photography and contour mapping during the mid-1950s added a sounder dimension to the field of land-use planning in general. In 1956, the country adopted a system of farm planning similar to that used in the USA.

This was a landmark development as it brought the country to modern systems of planning. Finally, continued government subsidies on conservation works together with assistance in the development of irrigation facilities such as dams, boosted soil and water conservation in commercial farms. However, several problems undermined progress during this period including: inadequate government funding, manpower shortages, conflicts over responsibilities between the Federal Territorial governments and the loss of staff after the collapse of the Federation of Rhodesia and Nyasaland (Whitlow, 1988). However, in spite of these setbacks, a framework for a more sustainable future in agricultural development had been established.

Phase 4: Mixed Fortunes, Post 1965

The unilateral declaration of independence (UDI) in 1965 brought a host of mixed fortunes to the country including political, economic and security threats. The sanctions, which followed the declaration of UDI forced the Rhodesian government to diversify its economy in order to survive (Kay, 1977). For example, import substitution was adopted as a national policy. In agriculture, farmers were forced to diversify their activities instead of relying on one product. The result was a '*trend of intensifying and broadening the base of the commercial farms. This, combined with the harnessing of water resources for irrigation, actually strengthened the commercial agricultural sector in the long term*', (Whitlow, 1988:7). In response to chronic droughts of the 1960s, some farmers resorted to game ranching as an alternative while more dams were constructed in order to encourage irrigation and to minimize the effects of droughts especially in the drier parts of the country such as the South Eastern Low-veldt. Most of the advice and environmental education came from government departments such as the NRB. As a result, a form of sustainable development was achieved.

Farmers were urged to limit their livestock numbers to the carrying capacities of their lands. For example, the Marginal Land Use Committee Report of 1968 emphasized the need for farmers to adopt sustainable methods of livestock and veldt management

(Whitlow, 1988). This included rotational grazing and resorting to game ranching, which was believed to be less damaging to the natural environment. Another advantage of wildlife was the fact that it was less vulnerable to disease outbreaks compared to livestock. Eventually, game ranching was accepted as an alternative form of land use.

However, the escalation of the liberation struggle during the 1970s undermined the agricultural sector as some farms were abandoned for security reasons. At the same time some peasant farmers occupied them in a spontaneous land invasion (Whitlow, 1988). During the post-independence era (early 1980s), resettlement schemes were established in the drier parts of the country resulting in massive deforestation, soil erosion and land degradation in general. This was mainly due to lack of proper planning and government support in these former white commercial farmlands (Tshuma, 1997). Although EMA has been providing EE in these areas, its impact is limited by poor funding and the lack of survival alternatives among resettled farmers (Bond and Manyanya, 2003).

b) *Land Degradation in Communal Farming Areas*

The problem of land degradation in Zimbabwe's communal areas (CAs) dates back to the colonial era (1890-1980) when blacks lost their land to white settlers through alienation (Kay, 1977).Whitlow (1988) identifies five historical phases associated with the deterioration of peasant farming areas, the so-called Tribal Trust Lands (TTLs). They include: Phase 1-Creation of reserves-pre-1926, Phase 2-Centralisation-1926-1951, Phase3-Agrarian reform-1951-1962, Phase 4-Uncertainty-1962-1969, and Phase 5-Growing pressures-post 1969.

Phase 1: Creation of reserves-pre-1926

It has been estimated that at the beginning of colonisation in 1890, there were about 400 000 black natives in what is now present-day Zimbabwe (Whitlow, 1988). Most areas were sparsely populated even though none was totally unclaimed by one tribe or another (Kay, 1970). However, following the unsuccessful Ndebele (1893) and Shona (1896-7)

rebellions, respectfully, the white settlers divided the country into European and African areas (Mpofu, et al, 2009). According to Whitlow (1988, 8)

"By the end of the second decade of colonial rule nearly 8.5 million hectares of land, just over one fifth of the country had been declared 'native reserves'…Generally the reserves were demarcated in areas where Africans were living at the time, particularly the more densely settled areas, and little account was taken of the population displacements that had occurred during the rebellions. European farms were concentrated in the central watershed region, especially following the construction of the railway line between Mutare, Harare, and Bulawayo. This effectively left the more peripheral parts of the country free for the creation of reserves".

Although the African population grew rapidly to 700 000 by 1911, with about 60% living in the so-called reserves, no attempt was made to increase their land allocation. It was generally assumed that what they had been given was sufficient for both contemporary and future needs (Kay, 1977). As the African population continued to grow due to natural increase and in-migration of families, which had been displaced from European farm lands, overcrowding emerged as a problem resulting in land degradation. Soil erosion was encouraged by the introduction of the ox-drawn plough, which replaced hoe cultivation. Since ploughing '*required complete clearance of woody vegetation, unlike hoe cultivation…it had a more lasting impact on the physical environment. The common practice of ploughing up and down slopes favoured erosion, especially the initiation of gulling,*' (Whitlow, 1988:9). No attempt was made to address the problems of African areas until 1924 when agricultural demonstrators were employed to educate black peasant farmers on how to manage their lands (Whitlow, 1988). This development took so long because it had not been a priority of the settler government (Kay, 1970).

Phase 2: Centralisation-1926-1951

As land degradation continued in the so-called reserves, efforts were made by the colonial regime to address the problem. In 1926, Lord Alvord

"*was appointed as the Agriculturalist for the Instruction of Natives. Gradually Alvord built a team of agriculturists and African demonstrators to assist peasant farmers and by 1945 he had a staff of 349 men* (Whitlow, 1988: 9).

Alvord's major contribution was to re-organize land uses in peasant farming areas into three categories, namely village, grazing areas and arable lands. Grazing areas were fenced off in order to prevent livestock from straying into crop lands. This strategy, known as centralisation greatly improved farming and conservation in the TTLs. Beginning in the Shurugwi district in 1929, it later spread to many parts of the country so that by 1946 some 3.8 million hectares in densely populated areas had been centralised.

With limited manpower, Alvord introduced basic conservation measures such as contour ridging and storm drains in many parts of the country. Beginning in 1936 under the supervision of Soil Conservation Officers and native demonstrators, by 1938, some 6510 hectares of arable land had been protected against erosion. However, grazing areas remained unprotected until 1944 when conservation measures were extended to them (Kay, 1970). During the 1920s, government viewed land degradation in the TTLs as a result of malpractices such as: indiscriminate cultivation, uncontrolled grazing and the lack of conservation knowledge. On the other hand, 'peasants saw the problems as symptoms of the need for more land' (Whitlow, 1988:9). The Land Apportionment Act of 1930 effectively ruled out any possibility of more land being granted to Africans.

The Natural Resources Act of 1941 made three recommendations concerning land degradation in the reserves, which according to Whitlow (1988), included: conservation of degraded lands against further use by people or domestic animals, reduction of livestock numbers where there was evidence of overgrazing, and obligatory soil conservation measures by the natives. Since the government lacked the will and funds to implement these recommendations, only de-stocking was applied. However, this was unpopular among the natives who were being politicised by black nationalists. It was also not clear to them how de-stocking would improve their livelihoods. So the cry for more land intensified (Kay, 1977).

In response to increasing land degradation in communal areas and pressure from nationalists, in 1950 the government set up Special Native Areas (SNAs) amounting to 1.7 million hectares (Whitlow, 1988). These were derived from un-used European land. Most of these areas were located in arid and tsetse fly infested parts of the country. By this time the population living in the reserves was about 1.25 million thereby exerting much pressure on limited resources. Alvord's centralisation scheme, which had started as a voluntary project based on persuasion, became compulsory as the government tried to reduce widespread land degradation in the reserves. By then, only 20% of these areas had been protected against soil erosion (Kay, 1970).

Phase 3: Agrarian reform, 1951-1962

As a solution to the problem of land degradation in communal areas, in 1951, the Rhodesian government introduced the Native Land Husbandry Act (NLHA). According to Whitlow (1988) the NLHA had three components, which included: a legal backing for the enforcement of conservation measures, the adoption of good farming practices, and replacement of the traditional land tenure system with one based on individual rights. The NRB believed that security of tenure would make farmers more responsible and accountable for any mismanagement of their land as failure to do so would result in legal action being taken against offenders (Kay, 1977). As a result of the NLHA, remarkable progress was achieved in many areas. For example, by 1957, more than 200 000 hectares of arable land had been protected through contour ridges and grass waterways. There were also plans to extend these programmes to about two thirds of the communal areas by 1961 (Whitlow, 1988). From 1955 to 1962 government spent more than US $3.4 million on conservation works in both TTLs and SNAs, which represented 9.8% of the total budget of the NLHA (Kay, 1970).

This apparent success, however, should be treated with caution as many reserves were characterised by poorly designed contour ridge lay outs. This was mainly due to the limited number of surveyors who were responsible for pegging ridge and plot boundaries.

Another reason is that most of the ridging was done by women and children who were already over-burdened by domestic chores. The migration of able-bodied men to towns and cities in search of employment had depleted most communal areas of their manpower. Some of the striking examples of poorly constructed contour ridges were to be found in Mutoko and Chiweshe TTLs (Whitlow, 1988). However, at national level, the programme was successful even though it had to be abandoned in 1962 due to political pressure from black nationalists.

Phase 4: Uncertainty, 1962-69

The period of uncertainty, which started after the suspension of the NLHA in 1962 also coincided with the collapse of the federation of Rhodesia and Nyasaland, re-organisation of administrative and technical structures as well as a review of policies. During most of the 1960s CONEX took over responsibility of agricultural extension services in TTLs. Government policy also granted more power to traditional leaders such as chiefs so that they could deal with local tenure issues thereby improving conservation and agricultural output. According to Whitlow (1988:13) environmental education in the form of conservation courses was introduced in order '*to enlighten and educate tribal leaders on the need for conservation from 1965 onwards*'. A model peasant farm was established at the Henderson Research Station with the aim of teaching tribal leaders how to improve output without causing harm to the environment.

From 1966 Tribal Land Authority Conservation Committees (TLACC) were initiated so as to develop communication between the NRB, extension staff and peasants. By 1969 some 46 committees had been set up throughout the country and were very effective in the enforcement of conservation regulations. In 1963 the government established a Lands Inspectorate Service in order to enable peasant farmers to apply basic conservation measures. Together with CONEX, this organisation, by 1967, had greatly improved soil conservation in many tribal areas (Whitlow, 1988). However, in spite of these efforts, the problem of land degradation persisted in many parts of the country due to population pressure thereby reducing agricultural productivity (NRB Annual Report, 1967).

Phase 5: Growing Pressures, Post 1969

The 1970s were characterised by political, economic and security turbulence, which forced the Rhodesian government to revise its land policies. This led to the introduction of the Land Tenure Act of 1969, which was aimed at re-distributing land equally between blacks and whites. Whitlow (1988) describes the Act as a cosmetic piece of legislation since it ignored land quality issues and population disparities between the races. The geographical distribution of communal areas (TTLs) was never altered and the best agricultural land remained firmly in the hands of the Europeans. However, the new act, according to Whitlow (1988) had three major implications. Firstly it gave more power to traditional leaders in the allocation and use of land. Secondly, it ruled out the possibility of any further land acquisition from European areas. This is because the government held the view that the solutions to the problems of land degradation lay in agrarian reform rather than land acquisition. Thirdly, the frustration of peasant farmers resulted in lack of cooperation with government officials and increasing support for guerrilla forces.

In spite of these developments, by the end of 1972, some 80% of the communal areas had been protected though contour ridges. Soon after independence, the new black government recognised land hunger as a problem and embarked on land re-distribution at national level. However, owing to restrictions from the Lancaster House Treaty and corruption from the new black elite, little progress was achieved until the end of the 1990s (Tshuma, 1997). Since 2000, the country has embarked on a massive land reform programme, which has been dubbed the Fast Track Land Reform Programme (FTRLRP). However, most of the beneficiaries of the programme have been supporters of the former ruling party, Zimbabwe African National Union-Patriotic Front (ZANU-PF). As a result, the problem of land hunger among most peasants remains critical even though 90% of all the former white commercial farms have been expropriated (Bond and Manyanya, 2003). Land degradation has also emerged in the newly resettlement areas due to deforestation and desertification. The poaching of wood fuel and wildlife in these areas has worsened environmental problems in these areas up to the present day.

c) Land degradation in African Purchase Areas (APAs)

The Native Purchase Areas (NPAs) were established in 1930 as part of the Land Apportionment Act. They were designed to accommodate the more competent black peasant farmers who would get an opportunity to embark on commercial farming (Whitlow, 1988). At its inception, the NPA programme set aside some 3.3 million hectares for this purpose. The farms averaged 90 ha each. By 1964 these areas were known as African Purchase Areas (APAs). However, throughout their history, they encountered problems of land degradation due to

'*lack of financial and manpower support for basic construction and maintenance of conservation measures. For example, inadequate water supplies and dip tanks involved trekking of cattle along roads and access routes through strips of state land separating blocks of farms. The resultant degradation was difficult to deal with since neither farmers nor the government would take action on these public areas*' (Whitlow, 1988:6).

The lack of conservation committees in these areas worsened the problem. Hence it was not until 1961 that these committees were increased in number and their status was upgraded to that of Intensive Conservation Area Committees (ICACs) in European farm lands. From that period onwards conservation efforts became more effective. However, due to lower population and stocking densities, these areas never experienced land degradation problems as badly as TTLs.

d) Mining

The mining industry plays a key role in Zimbabwe's economy, contributing 5% and 23% to the country's Gross Domestic Product (GDP) and total exports, respectively (Chiwota and Hauge, 1996). With over 40 minerals produced in 1992 the country employed more than 60 000 people, generated at least 45% of the nation's foreign exchange and contributed significantly to the domestic manufacturing industry (Munezvenyu, 1992).

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There were about 600 mines throughout the country including: 20 open cast, 80 underground/shaft, 300 surface dumps and 200 quarries (Chiwota and Hauge, 1996). The main minerals currently produced are: coal, asbestos, gold, iron ore, nickel, platinum, lithium and diamonds.

Apart from its contribution to the economy, the mining industry has also caused numerous environmental problems such as soil and water pollution, mine shafts, dumps, dust, noise and the development of derelict landscapes and ghost towns (Munowenyu, 1996). During the colonial era and until 2001, the mining industry was governed entirely by the Mines and Minerals Act whose latest version is that of 1996 (Mines and Minerals Act Chapter 21:05 of 1996). However, since 2002 EMA has been working 'in conjunction with the older Act, which has been revised numerous times since 1961' (Mapira and Zhou, 2006:48). The goal of the new arrangement is to ensure the achievement of SD in all mining activities throughout the country (including formal and informal activities such as gold and diamond panning).

Since the government is aware of the negative environmental effects of the mining industry, the goal of EMA is to reduce these impacts without under-mining its contribution to the nation's economy. According to Chiwota and Hauge (1996: 120)

> '*the growing environmental consciousness within civil society has been criticised by some industrialists as a case of politics running too far ahead of economics*'.

However, this controversy is not confined to Zimbabwe as most developing nations face a similar dilemma in their quest for industrialisation (Chenje and Johnson, 1996). As an environmental watch dog agency, EMA is guided by nine principles, according to Part 11 Section 4 page 360. Firstly, all elements of the environment are linked and inter-related, therefore environmental management should be integrated and the best practicable environmental option pursued. Secondly, environmental management should put people and their needs at the centre of its concern. Thirdly, the involvement of all interested and affected communities in environmental governance should be promoted so that they may

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develop knowledge, skills and capacity for achieving equitable and effective participation.

Fourthly, environmental education, awareness and the showing of knowledge and experience should be promoted in order to increase the capacity of communities to address environmental issues and engender values, attitudes, skills and behaviour consistent with sustainable environmental management. Furthermore, development should be socially, environmentally and economically sustainable. Anticipated negative impacts on the environment and people's environmental rights should be prevented or minimised and remedied. Persons or organisations found guilty of pollution or causing environmental degradation should pay for their actions. Global and international responsibilities for the environment should be respected and discharged. Finally, endangered ecosystems should be preserved against further damage.

However, since its inception in 2002, EMA has faced challenges, which limit its capacity in dealing with problems of environmental degradation. These, according to Mapira and Mungwini (2005) include: poor funding, manpower shortages and general poverty, which drives some people into activities that promote environmental degradation such as gold and diamond panning. On the other hand, some mining companies fail to reclaim their mines once the minerals have been depleted. As a result derelict landscapes and ghost towns have emerged in many parts of the country. Examples include: Vanguard (Mberengwa), Empress (Kadoma), Angwa, Alaska and Mhangura in Mashonaland Central (Mapira and Zhou, 2006). According to Chenga (2004), most of the infrastructure that had been invested in these settlements has been lost to looting or decay.

In the light of the above facts, EE strategies from EMA and various NGOs are not likely to achieve their goals unless fundamental changes occur at national level. These include strengthening of the legal framework in which they operate as well as addressing poverty issues. For example, during the 1990s, Environmental Impact Assessments (E.I.As) were not mandatory. Hence investors had no obligation to implement them since economic interests took precedence over environmental concerns (Chiwota and Hauge, 1996). This

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scenario resulted in the proliferation of environmental degradation in many parts of the country (Lopes, 1996). However, since 2007, E.I.As are now mandatory, and no new projects can be done without government approval (Mapira, 2012a). Poverty is also known to be a major cause of environmental degradation especially in communal areas where peasants eke out a living from their environment (Chimhowu, et al: 2010).

e) Industry

Zimbabwe's manufacturing industry experienced massive growth during the colonial era following the Unilateral Declaration of Independence (UDI) in 1965 (Whitlow, 1988). The introduction of import substitution as a national policy boosted industrial expansion and led to self-reliance especially in manufactured goods. As a result, manufacturing became one of the three pillars of the national economy (the other two being agriculture and mining). Industrialization, however, posed a threat to the biosphere. Just as in the case of the mining industry, controversy arose '*because of the complexity of the subject as well as the existence of different interests*' (Chiwota and Hauge, 1996: 120). While environmentalists have opposed the negative effects of industry on the biosphere, economists and investors argue that pollution is a necessary evil that every country has to pay if it has to industrialize (Miller, 1994).

Some of the major polluting industries include: ore processing, steel making, brewing, food processing, pulp and paper producing companies (Lopes,1996). According to Chiwota and Hauge (1996), Zimbabwe's industrial pollution can be attributed to three main sources, namely: the direct environmental effects from industry, secondary effects from production, and wastes derived from consumer products. EMA, together with NGOs have been monitoring the negative effects of industrial pollution (air, land and water) in order to sue the culprits.

However, legal action has not always produced the desired results due to the complexity of the problem at both local and national levels (Mapira and Mungwini, 2005). For example, some of the worst polluters are municipalities and government ministries who

default paying fines due to lack of funds. It has also been difficult for one arm of government (such as EMA) to sue another (for example, a government Ministry, department or municipality). This inevitably strains relations between the respective government officials who are brought into the resultant legal battles (Mapira and Mungwini, 2005).

f) Urbanisation

As a universal process, urbanisation has exerted a remarkable impact on the biosphere. In Zimbabwe, it has caused land degradation on the outskirts of towns and cities, river, air and noise pollution in urban centres (Moyo, 1997; Mapira, 2001). Land degradation takes the form of deforestation, soil erosion, river siltation and the loss of bio-diversity (Magadza, 1992). River pollution is due to domestic, industrial and commercial waste disposal problems, which prevail in these settlements (Moyo, 1997). In most towns and cities, both sewage and solid waste disposal problems are major challenges and attempts to address them have not always succeeded due to limited funds and technical problems (Mapira and Mungwini, 2005). The need for EE and SD programmes, which target industries, municipalities and ordinary citizens, is obvious as some researchers have shown (Chimhowu, et al 2010). The next section examines how Zimbabwe addressed its environmental problems at the Rio Summit of 1992.

2.10.5.1. Zimbabwe and Agenda 21

This section explains how Zimbabwe addressed its environmental problems at global level by examining its response to Agenda 21. In preparation for the Rio Summit of 1992, the government convened a multi-sect oral conference in 1991 with the aim of producing a national report for the UNCED conference (Bengtsson, 1996). The convention was attended by representatives from public and private sectors, NGOs, agriculture and international organisations. Three recommendations were made at the end of the conference. The first one was to make the Ministry of Environment and Tourism the key coordinating agency of environmental issues with legal backing from the Natural

Resources Act, which dated back to the colonial era. Secondly, other relevant agencies identified included: Ministries of Lands, Water Development, Agriculture, Health and Child Welfare, Mines, Local Government, Rural and Urban Development, National Affairs, Transport, Energy, Employment Creation and Cooperatives. However, they would play a subsidiary role in environmental sustainability issues since they had other priorities to take care of.

Finally, streamlining the institutional and legislative framework of environmental related issues was also recommended. According to Bengtsson (1996:172)'*This would allow for better and more efficient and professional monitoring and assessing of environmental measures, thereby also facilitating preparation of environmental impact assessments when projects are under consideration*'. The last recommendation was to arrest the degradation of communal areas through strategies such as: making the population of these areas accountable for the environment, improving the legislative framework, increasing investments in rural areas, including environmental studies in teacher's training colleges, disseminating information on environmental issues at schools and in surrounding communities.

But the report has been criticised for its failure to prioritise environmental concerns when critical decisions were made. For example, '*the only piece of legislation taking priority over other Acts, was the Mines and Minerals Act which enabled mines to be established wherever minerals existed and once a mining claim (was) pegged, other Acts (could not) be considered*' (Bengtsson, 1996: 172). This shows that economic interests would override environmental concerns. However, this apparent contradiction was not new as it had been manifested through the NCS, which lacked power to enforce EIAs on all major investments (Lopes, 1996).

In more recent years significant improvements have occurred in the country's environmental policy and institutional framework (Chimhowu, et al, 2010). This followed the development of a comprehensive policy by the Ministry of Environment and Tourism in collaboration with the Institution of Environmental Studies at the University

of Zimbabwe in Harare. The revised policy document which was launched in 2009 after wide consultations with stakeholders (such as peasants, resettled villagers and industry) covers major issues including: the maintenance of environmental integrity, social and economic matters, environmental management, organisational responsibilities, institutional arrangements, and financial mechanisms.

The latest policy version seeks to alleviate poverty at grass roots level, improve the quality of life and ensure the sustainable use of the environment. This is in sharp contrast with previous versions which were largely punitive in nature and often criminalised rural communities for their use of natural resources (Lopes, 1996). Since the promulgation of the Environmental Management Act, EIAs have become mandatory for all new projects. For example, '*Clause 97 of the Act states that no person shall carry out any project which affects the environment without first having submitted an environmental impact assessment prospectus and carrying out a full EIA if required. Under the Act, periodic environmental audits of these projects are to be carried out to ensure compliance*' (Chimhowu, et al, 2010: 60).

However, in spite of this positive development, implementation has been weak, inadequate or ineffective. Two main reasons account for these problems, namely: financial constraints and in some cases the lack of political will. For example, the country's Fast Track Land Re-distribution Programme was never preceded by an EIA, nor was there any budget reserved for its implementation (Bond and Manyanya, 2003). To date EMA is under-funded and under-staffed, factors, which undermine its daily operations. Other factors include lack of information on issues of environmental management and its benefits. Chimhowu, et al, 2010: 60) claim that:

'*More education and awareness on the concept of environmental management and protection is needed by all stakeholders, so that compliance is viewed as a positive contribution not only to enhance environmental quality but also that greener production can result in higher profits and better social conditions…There is an international shift away from depending on EIAs as an environmental management tool towards a more*

strategic approach, which incorporates larger scales and cumulative effects, rather than the focus on individual projects'.

2.10.5.2. Zimbabwe's environmental policy since independence

Zimbabwe's environmental policy has been based on the principles, which were adopted by the NCS during the early years following independence (in 1980) and those derived from Agenda 21 (Lopes, 1996). A major achievement of the NCS was that for the first time in the country's history, environmental issues were put on the fore-front of decision-making. Its goal, according to Bengtsson (1996, 168) was '*to integrate sustainable resource use with every aspect of the nation's economic development and to rehabilitate those resources which are already degraded*'. However, the NCS has been heavily criticised for various reasons (Lopes, 1996). Firstly, as an action plan, it lacked implement-able parameters. Secondly, it did not specify government's institutional responsibility on environmental issues apart from recommending the establishment of a Ministry of Environment and an inter-ministerial committee for the environment.

Thirdly, it gave priority to economic growth at the expense of environmental sustainability issues as mentioned previously. Finally, it was never tabled for discussion in parliament, nor was it included in the Second Five Year National Development Plan, the country's first development plan, which was launched soon after independence. These weaknesses reflect the lack of will and political commitment on the part of Central Government (Lopes, 1996). However, in spite of these short-comings, the NCS has been commended for adopting '*persuasion and education, with legislation enforcement limited to relatively few instances*' (Bengtsson, 1996: 169). The Ministry of Environment and Tourism was the custodian of environmental policy at national level as mentioned previously. On the other hand, ecological protection and conservation in Zimbabwe dates back to the colonial era when the NRB was the main agent of environmental protection in the country (Whitlow, 1988). Since 2002, EMA, a branch of the Ministry of Environment and Natural Resources is now fully in charge of this role with the assistance of other ministries and organisations mentioned previously.

The Ministry of Environment and Tourism, according to Lopes (1996) had several objectives which included: conserving natural resources such as: air, water and soil, preserving the bio-diversity of plants, animals and ecosystems, ensuring that national resources can support human, plant and animal life, preventing irreversible environmental damage, correcting past errors of environmental damage, ensuring the efficient use or conservation of natural resources, developing skills and training resource managers in the country, controlling and regulating the disposal of waste products, increasing public education and awareness of the environment, and enforcing environmental policies and legislation in support of sustainable development.

Existing literature shows that poverty is a major cause of environmental problems as people eke out a living from natural resources such as wood fuel, alluvial gold and diamonds (Mapira and Munthali, 2011). In 1992, the Ministry of Environment and Tourism conducted a national survey that was aimed at defining the objectives of SD in the country. One of the recommendations that came from the survey was the need to meet the '*basic needs of people*' (Lopes, 1996:187). In communal areas for example, people eke out a living from the environment, which is crowded and overstocked. Deforestation occurs due to the demand for timber, wood fuel and the need to clear more land for cultivation (Nkala, 1996). Soil erosion is due to overcrowding and overstocking, among other factors.

To date, more than a decade after the country launched its Fast Track Land Reform Programme, the problem of land hunger among some peasants remains critical (Chimhowu, et. al, 2010). This is because the land distribution programme was marred by corruption and in many cases it did not benefit the land-less peasants (Bond and Manyanya, 2003). Reports of multiple farm ownership among ZANU-PF officials have confirmed this fact. As a result, there is growing consensus at national level that the land reform programme is still an unfinished business even though over 90% of commercial farms have been expropriated from their former white owners.

2.10.5.3. Environmental law reform in Zimbabwe

During the late 1990s, Zimbabwe had nearly 20 environmental laws, most of them originating from the colonial era (Moyo, 1998). These laws were administered by at least eight different ministries and were characterised by overlaps, which often resulted in duplication and inter-ministerial conflicts (Mapira and Mungwini, 2005). The laws were also expensive to implement as they relied heavily on government administration and enforcement through the use of fines and penalties (Lopes, 1996). Another problem is that most of them were out-dated and out of step with contemporary global and regional trends such as the need for environmental impact assessments (EIAs) and environmental audits. Others did not reflect some of the international conventions and protocols that the country had joined. Consequently, the need for reform became urgent.

In 1998, the Ministry of Mines, Environment and Tourism (MMET) initiated a process of environmental law reform with several characteristics. The new Act would be administered through the then Ministry of Mines, Environment and Tourism. It would replace the Natural Resources Act, which had been established during the colonial era. It would include basic principles of environmental management and sustainable development. The new Act would override other laws, which had a stake in environmental issues. Although other ministries concerned with the environment would continue their activities, they would be guided by the new Act. According to Moyo (1998), the new Act was expected to achieve several objectives, such as: greatly improve the legislative foundation for environmental management in the country, overcome the weaknesses and fragmentation of existing legislation, generally deal with environmental issues across the different sectors, including basic principles of environmental management and sustainable development, and enhance the Ministry of Mines, Environment and Tourism's role as the leading environmental protection organ.

Moyo (1998) also outlines the advantages of the new law. It takes the environment as an integrated system, which should be managed on the basis of all embracing environmental principles, policies and plans and the co-ordination of environmental management at both

the local and national levels. It allows individual ministries to achieve their goals while continuing to participate in environmental management. It provides a more rational and comprehensive approach to the legal regulations of the environment. It promotes a co-ordinated approach to environmental management and the integration of environment and development, and the Ministry of Mines, Environment and Tourism, which proposed the introduction of the new Act was guided by ten principles.

Firstly, sustainability and consideration of the development needs of current and future generations are the corner stones to environmental management. Secondly, human dependency on the complex and diverse ecosystem requires management approaches that integrate economic, social, cultural and natural environments. Thirdly, anticipating and preventing negative environmental impacts is less costly and more effective than correcting problems since human knowledge of nature is quite limited. Fourthly, the country's ability to monitor, evaluate and sustain the environment depends upon setting effective and practical environmental standards. Furthermore, monitoring environmental quality and controlling pollution should be supported by high quality laboratories or private individuals on a cost recovery basis.

The effectiveness of environmental legislation and co-operation in environmental management depends upon a fair and yet effective system of penalties and incentives, which encourage sustainable development and focus the burden on those that abuse the environment. All Zimbabwean citizens should have the right to a clean and healthy environment and share an obligation to keep it that way. Effective and efficient environmental management relies on a well co-ordinated and integrated system of institutional arrangement. Society's ability to make well-informed decisions concerning the environment is dependent on meaningful public participation in the environmental management process. Finally, Zimbabwe's laws should recognize and seek to implement international environmental conventions to which it is a signatory.

2.10.5.4. Environmental management institutions in Zimbabwe

Environmental management is integrated at all levels of development planning beginning with the grass roots or village unit (G.oZ, 2009). Issues included now range from desertification, land degradation, soil erosion, pollution, climate change to ozone depletion. This is because the country is a member of various international organisations, which seek to promote environmental protection such as the Regional Drought Monitoring (RDM) organ, which covers east and southern Africa, the African Ministerial Conference on the Environment (AMCEN) and the Zambezi Water Authority (ZWA), which regulates the use of Zambezi's water (Chimhowu, et.al, 2010). In addition, organisations such as EMA, municipalities and NGOs are also actively involved in environmental management issues at national and local levels.

Although Environmental Management in Zimbabwe falls under the Ministry of Environment and Natural Resources Management, its mandate is executed through EMA, the Forestry Commission, Parks and Wildlife Management Authority, Zimbabwe Tourism Authority, and other government departments and ministries (Chimhowu, et al, 2010). As mentioned previously, the Environmental Management Act came into operation in 2002. Five years later in 2007, the Department of Natural Resources was transformed into an agency, namely EMA, which now has offices at national, provincial and district levels (G.o.Z, 2009). Some of the challenges, which the agency is facing according to Chimhowu, et, al (2010), include: under-staffing at national, provincial and district level, which reduces its efficiency, shortage of vehicles for travel and monitoring activities, low salaries for staff, which results in high turn-over rates and loss of institutional memory, and poor funding which undermines the agency to effectively execute its mandate at all levels (district, provincial, national and international).

District councils also play an important role in environmental management. For example, they make by-laws, which are then implemented in their areas of jurisdiction. The Traditional Leader's Act of 1999 empowers headmen and village assemblies to enforce '*all environmental planning and conservation by-laws on behalf of the chief, the district councils and the state*' (Chimhowu, *et.al*, 2010: 61). The involvement of traditional leaders such as kraal heads and chiefs is important since they command a lot of respect at grass roots level and are the custodians of cultural norms and values (Chandiwana and Moyo-Mhlanga, 1996). Through the use of scientific knowledge derived from training as well as indigenous knowledge systems (IKS), they proved to be quite effective in matters of environmental conservation and management during the colonial era (Whitlow, 1988). However, soon after independence, the Government side-lined them and handed over their authority to village development committees (VIDCOS) and Ward Development Committees (WADCOS). This was mainly due to the socialist ideology of the time. Realising its mistake, the government has since re-empowered traditional leaders with their lost authority (Chimhowu, et al, 2010).

In urban areas, municipalities and city councils are also involved in environmental management. This role is executed through the Department of Environmental Health, a key arm of all urban local authorities (Jordan, 1984). The main goal of this department is to maintain a clean urban environment through solid waste and sewage disposal activities. It also provides EE to the public through awareness campaigns. However, the shortage of funds, vehicles and other technical resources tend to undermine its effectiveness in most urban centres (Mapira, 2011a). Apart from government institutions, NGOs also play a significant role in environmental management in Zimbabwe. Examples, according to Lopes (1996), include: Environment Africa (EA), Southern Alliance for Indigenous Resources (SAFIRE), Communal Areas Management Programme for Indigenous Resources (CAMPFIRE), Zimbabwe Environmental Law Association (ZELA), Zambezi Society (ZS), and Wildlife and Environment Society (WES).

Others include: CARE International, CARITAS Masvingo and Christian Care. Although most of these NGOs are mainly involved in poverty reduction programmes, they also address environmental issues. They operate at local level and usually adapt their activities to suit community needs (Chimhowu, et al, 2010). They usually work in collaboration with district councils and government environmental agencies such as: the Forestry Commission (FC), Agricultural, Technical and Extension Services (AGRITEX), Environmental Management Agency (EMA), and Parks and Wildlife Management Authority (PWMA).

Some of the projects run by environmental NGOs include: waste recycling, tree planting, natural product enterprises, herb and nutrition gardens, training and capacity building (Lopes, 1996). In some cases they collaborate with schools and colleges in providing environmental awareness and education (G.o.Z, 2009). Environment Africa, for example, has been involved in supporting Policy and Environmental Management for schools for over a decade (Lopes, 1996). This is in line with the NGO's goal of SD in the country. In conjunction with other SADC countries, Zimbabwe has adopted the Millennium Development Goals (MDGs) as a Sustainable Development Strategy. The MDGs are co-ordinated through the Ministry of Labour and Social Welfare and they include: eradication of extreme poverty and hunger, promotion of gender equity and women empowerment, combating HIV and AIDS, malaria and other diseases, ensuring environmental sustainability, and access to improved water sources and sanitation.

Not much progress has been achieved in the first four goals due to constraints such as inadequate financial and technical resources. However, in the last goal the country had recorded 81% and 53% success rates by 2004 according to World Development Indicators Data base (Chimhowu, et.al, 2010). Zimbabwe is also involved in Trans-boundary natural resource management at regional level (Katerere, et.al, 2001). The main goal of Trans-frontier Conservation Areas (TFCAs) is to promote the conservation of wildlife across political boundaries. Wildlife includes flora and fauna that occur naturally in these areas (Chenje and Johnson, 1996). To date, Zimbabwe is involved in six TFCAs, which include: Chimanimani (Zimbabwe and Mozambique), Okavango Zambezi

(Zimbabwe, Zambia, Namibia and Botswana), Great Mapungubwe (Zimbabwe, South Africa and Botswana), Manna/Lower Zambezi (Zimbabwe and Zambia), The Great Limpopo Trans-frontier Park (Zimbabwe, South Africa and Mozambique), and ZIMOZA (Zimbabwe, Mozambique and Zambia).

However, during the last decade, Zimbabwe's efforts in these projects have been undermined by poor funding due to the country's economic down-turn and international isolation (Bond and Manyanya, 2003). This has negatively affected the country's goal of achieving SD in wildlife conservation and management. There is a need to make state environmental institutions more visible especially at the grass roots level. This requires more staff at national, provincial, district and even village levels. However, this has implications on the funding of environmental management programmes and considering government's limited financial capacity, this may not be possible in the near future. Chimhowu, *et. al*, (2010) make several recommendations for the achievement of SD at national level. Professionalism in the form of accountability and transparency are necessary among staff. Consequently, there is a need for training and capacity building at all levels of administration of these projects. Regular audits of the state of the environment are also necessary considering the upheavals that have occurred since the beginning of the country's Fast Track Land Reform Programme. Information derived from such audits can be used for planning purposes by the Ministry of Environment and Tourism. There is a need to set up models of natural resource management, which can be disseminated to communities with a view to promoting SD while alleviating poverty at grass roots level. Finally, EE directed at inculcating values, attitudes, skills and behaviour that promotes SD among communities should be provided.

2.10.5.5. E.E. Policy in Zimbabwe

Zimbabwe's current EE Policy is the product of a broad consultative process, which took place between 2000 and 2001 (Shava, 2003). Before the signing of Agenda 21, '*although there were various Environmental Education (EE) initiatives in Zimbabwe, there was no overall official policy for Environmental Education*' (GoZ, 2003). However, the enactment of EMA in 2002 paved the way for the development of a national EE policy,

which would cover all major sectors of the country's socio-economic life including: formal and non-formal/informal education. The latter, according to the GoZ (2003) comprises several sub-sectors such as: Government ministries, departments and institutions; NGOs, community-based organisations (CBOs) and community groups, resource, research and documentation centres, EE centres, industry and business, media, youth, and arts and culture.

Each of these sectors and sub-sectors consists of nine objectives, which guide them in the implementation of EE policy at local and national levels (G.o Z, 2003). For example, in the formal education sector, several objectives apply. The first one is identifying and mobilising resources to initiate self-sustaining EE activities. The second is to integrate EE in teaching, learning, training and extension programmes in formal, non-formal and informal sectors of education. The third one is to raise public awareness of environmental issues and promote holistic management of the environment in all sectors of the community. A fourth objective is to facilitate the development of knowledge, skills, attitudes and values requisite for environmentally sustainable behaviours. This is followed by the promotion of sustainable development through the use of all channels of communication. Encouraging sustainable livelihoods within communities not usually reached by formal channels of education and communication is another objective as well as protecting and promoting the use of indigenous knowledge systems. Finally, the last two objectives are to support private and public initiatives in EE research, and to ensure the monitoring and evaluation of EE programmes and activities in all sectors.

The non-formal and informal education sectors are guided by nine objectives (G.o. Z, 2003). These include the integration of EE in teaching, learning, training and extension programmes in the formal, non-formal and informal sectors of education. The second one is to raise public awareness of environmental issues and promote a holistic management of the environment in all sectors of the community while the third is to facilitate the development of knowledge, skills, attitudes and values requisite for environmentally sustainable behaviour. The fourth and fifth objectives are: to promote SD through the use of all channels of communication and to encourage sustainable livelihoods within

communities not usually reached by formal channels of education and communication, respectively. They are followed by four more objectives, which include the identification and mobilisation of resources to initiate self-sustaining EE activities, protecting and promoting the use of indigenous knowledge systems, supporting private and public research in EE initiatives, and ensuring the monitoring and evaluation of EE programmes and activities in all sectors.

 The formulation of the policy document included participants from government, industry, civil society, NGOs, educational and other institutions (Shava, 2003).. The Ministry of Environment and Tourism and the Department of Natural Resources (DNR) initiated the process and delegated the responsibility to an environmental education policy working group. The multi-sect oral approach ensured that all stakeholders were involved in the formulation process thereby producing a document that was acceptable to them since '*the needs and aspirations of the various stakeholders had to be gathered and a national consensus on proposed strategies for environmental education reached*' (Shava, 2003:130).The document also takes into account Zimbabwe's affiliation to the International Union for the Conservation of Nature (IUCN) and trans-boundary wildlife conservation agreements within the SADC region.

The actual drafting of the document was conducted by the following groups and organisations including: Zimbabwean members of the Commission of Education and Communication (CEC), a network of IUCN experts, the Zimbabwe Environmental Education Consultative Forum (ZWEECF), an organisation which was formed in 2000 with a mandate to develop an EE policy for the country, the Environmental Liaison Forum (ELF), the Department of Natural Resources (DNR) under the Ministry of Environment and Tourism, the Ministry of Higher and Tertiary Education, and the Ministry of Education, Sports, Arts and Culture. The production of the policy draft was done with the full support of the IUCN and it classified stakeholders into two broad educational categories, which according to Shava (2003) included: **formal**, and **informal** and **non-formal**.

While the first sector included the formal school system (pre-school, primary and secondary schools, teacher's colleges and universities), the second one comprised all non-formal and informal institutions, which provide EE. Examples are: Government Departments such as EMA, local government sections such as Environmental Health Departments, industry, NGOs, media, arts, research, EE centres, youth organisations, resource and documentation centres. It should be noted that the above categories (formal and informal/non-formal) were regarded as sub-sectors of the over all EE policy at national level.

According to Shava (2003), several lessons were drawn from the policy development process. The involvement of a diverse range of stakeholders in the formulation process made the final document acceptable at national level. The participatory approach that was adopted in the formulation process gave stakeholders a strong sense of ownership of the resultant policy document. In spite of the diverse range of stakeholders, there were many convergent views on some of the key objectives for example the need to focus on indigenous knowledge and its potential in EE processes. Though costly, stakeholder participation is good as it accommodates the diverse views and concerns of society as a whole. The multi-sect oral approach that was adopted encouraged the cross-fertilization of ideas while dispelling prejudices against some sectors. For example, industry is regarded as a major polluter and yet it is making serious efforts towards SD through the implementation of environmental management standards such as ISO 14 000.

Sector-specific workshops led to the expansion and consolidation of views drawn from the generalised multi-sect oral workshop. The multi-sect oral approach identified gaps and strategies to address them. For example, the formal sector has been subject-discipline oriented as most EE is conducted in carrier subjects such as: agriculture, geography and the natural sciences (biology, chemistry and physics). In these subjects, only the biophysical aspects of the environment are emphasized. Curriculum greening was suggested in order to provide EE to all subjects including non-scientific ones. It however, noted that introducing EE as a separate subject was not possible since the school curriculum was already over-burdened. In the informal sector, it was observed that more

environmental reporting was necessary as it would generate more public awareness on EE issues.

2.10. 5. 6 Zimbabwe's EE policy document

In terms of policy development, Zimbabwe has made more progress than some of its neighbours in the SADC region. According to Mukute, et.al (2012, 43), the country '*is doing well in the area of environmental education where it has introduced sustainability in agricultural curricula of colleges: introduced environmental science and health education at all levels in primary and secondary schools: and begun post-graduate training in Forestry Management. Recently the Ministry of Environment and Tourism has partnered with the University of Zimbabwe and plans to offer a Bachelor of Science honours degree in Meteorology as it currently relies on external staff... It introduced carbon tax and energy levying in 2001...and countries...who are interested in such levies can learn from Zimbabwe's experience. However, the extent to which these levies are used for environment and development appears limited*'.

The country's EE policy document has been commended for being comprehensive, detailed and specific with clear objectives (Shava, 2003). However, this is not surprising since the country is renowned for producing good plans, policies and strategies (Lopes, 1996). It is at the implementation stage where challenges have often emerged mainly due to the lack of political will (Mapira, 2012a). Poverty in rural areas has also been identified as another challenge (Shumba, et.al, 2008). At national level, other problems have also emerged including: the under-staffing of EE providers such as EMA, limited funds, scarcity of EE literature, lack of alternative sources of energy and corruption among some government officials (Mapira, 2012a). At the grass roots level, most villagers do not take environmental protection seriously as they are pre-occupied with survival issues (Lopes, 1996). Consequently, they resort to deforestation, and alluvial gold and diamond panning, thereby further damaging the environment (Mapira and Munthali, 2011).

Other challenges which the country is facing include: '*policy analysis, coordination and collaboration, accountability (environmental governance), research, information management and monitoring systems,...infrastructure, equipment and facilities...Coordination between different ministries and sectors is relatively weak and accountability systems regarding monitoring and enforcement of environmental legislation are inadequate. Security of tenure is another institutional capacity need in Zimbabwe. Land use planning in newly resettled areas is lacking and public access to information on land degradation, climate change and biodiversity loss is limited...Zimbabwe has neither systems for accrediting Environmental Impact Assessment practitioners, nor the capacity to draw up terms of reference for them. The country has not yet developed an integrated climate change and adaptation policy for responding to the issue strategically and holistically...Zimbabwe's capacity to collect, analyse, store and disseminate information of public interest is low, partly because of high staff turnover at the Central Statistics Office. In general, monitoring equipment and facilities are inadequate. In urban areas local authorities are ill-equipped to monitor air pollution while among law enforces, there is lack of capacity to identify toxic substances*' (Mukute, *et.al*, 2012:43-4).

In examining the Zimbabwean EE programme, the researcher, among other things, takes these issues as important indicators of its performance in the pursuit of SD. Consequently, references are made to them throughout the rest of the study.

2.10.5.7. Zimbabwe's EE Programmes

According to Section 5.5 of the National Environmental Policy and Strategies (G.o.Z, 2003) Guiding Principle 26, Zimbabwe's EE policy seeks to educate the public on environmental issues so as to promote effective environmental conservation and management. This is in line with the regional goal of enabling EE practitioners in the SADC region to '*strengthen environmental education processes for equitable and sustainable environmental management choices*' (SADC REEP Report, 2012). In order to achieve this goal, several strategies have been recommended at the regional level. Firstly,

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there is a need to improve the effectiveness of existing EE programmes by promoting the inclusion of both scientific and indigenous knowledge and practices in formal, informal and non-formal teaching, learning, training and extension programmes. Secondly, relevant environmental issues should be integrated into the national curriculum at all levels. Thirdly, educational programmes should be supported so as to increase environmental awareness and public involvement, especially among the disadvantaged and less literate groups.

Fourthly, in order to enhance the skills and understanding of education personnel on environmental issues, capacity building and training programmes should be encouraged and supported. Furthermore, local languages and drama in EE should be promoted. There is also a need to provide incentives for institutions engaging in environmental awareness and education. Finally, establishing monitoring and evaluation mechanisms to ensure the relevance and effectiveness of EE programmes is a necessity. A major weakness of EE in the country is its lack of visibility at local level. Consequently, Zimbabwe's EE Policy document recommends the establishment of EE centres in various communities throughout the country (G.o.Z, 2003). However, more than a decade after the production of the policy document, none have been established so far, partly reflecting the lack of commitment on the part of government.

Having examined Zimbabwe's EE policy in theory, it is necessary to look at how it has been implemented in various sectors of the country's socio-economic life.

EE in Non-formal and Informal Organisations

During the colonial era and the first decade after independence, EE was delivered in the form of *natural resource conservation* education in large-scale commercial farms, communal areas, mines, industries and urban areas (Whitlow, 1988). To date in informal and non-formal education circles, government departments (such as EMA, Forestry Commission, AGRITEX, and PWMA), local authorities and NGOs play a significant role in the delivery of EE to the public (G.o.Z, 2009). Hence the role of such organisations has

been crucial. However, their operations and visibility at grass-roots level have been limited by inadequate funding (Mapira, 2012a). In developed countries 'green' political parties have been on the fore-front of both legislation and EE (Miller, 1994). Given that in Zimbabwe, no such parties exist, it is necessary for government ministries and departments to be more involved in EE awareness campaigns at local and national levels.

When EMA was launched in 2002, some of its main goals (according to the Environmental Management Act of 2002: Chapter 20:27), were: the achievement of sustainable management of natural resources and protection of the environment, the prevention of pollution and environmental degradation, and, the promotion of environmental education and awareness with the aim of empowering communities to solve some of their environmental problems. Consequently, it plays a key role in the dissemination of environmental education and awareness at national, provincial, district, ward and village levels.

However, the lack of adequate funding and limited visibility at grass roots level are major constraints as mentioned previously (Chimhowu, et.al: 2010). In its regular operations, EMA is guided by a calendar of events for each year. For example, the calendar for 2012 included global and national events that have been observed in the country over the years beginning with the World Wetland Day in February and ending with the National Tree Planting Day in December (Table 2.2). This calendar is significant especially in the dissemination of EE in both urban and rural communities.

Table 2.2: EMA Calendar for 2012

Event	Date of Commemoration
World Wetland Day	2 February
Africa Environment Day	3 March
World Water Day	22 March
World Meteorological Day	23 March
World Earth Day	22 April
National Fire Week	4 May
World Environment Day	5 June
World Day of Desertification	17 June
International Day of Bio-diversity	22 July
International Day for the Preservation of the Ozone Layer	16 September
Clean Up Zimbabwe Day	17 September
National Tree Planting Day	4 December

Source:EMA Headquarters, Harare

While EMA's vision is to be '*a world class lead Agency in sustainable and integrated environmental management*', its mission statement is '*To promote sustainable management of natural resources and protection of the environment with stakeholder participation*' (EMA 2010 Annual Report, page 1). Some of its activities during 2010 included: monitoring the negative environmental impacts of mining projects, processing of EIA statements, conducting EIA inspections (Table 2.3), issuing fines to violators of the EMA Act regulations, interventions on sand abstraction, issuing carbon emission licences, providing effluent licences and effluent discharge permits, conducting vehicle inspections at border posts so as to discourage the use of those that are no longer ozone friendly, collecting water samples for analysis, monitoring national fire risk variations, organising clean up operations at provincial level, conducting environmental awareness

outreaches, and training law enforcers and traditional leaders on environmental protection.

In 2010 EMA reached some 200 296 people '*through environmental awareness programmes which included exhibitions at agricultural shows, clean up campaigns, awareness campaigns, commemorations, school debates and competitions as well as Miss Earth competitions*' (*EMA's 2010 Annual Report*, page 30). It also distributed publicity materials, which amounted to 11 345 in the form of pamphlets, fliers, posters, t-shirts, bags and calendars. These materials helped in the dissemination of environmental information to the public so as to educate communities about environmental issues. Although these figures seem to be impressive, remote areas in many rural areas were never reached owing to transport problems. Consequently, EMA has been criticised for being invisible at grass roots level (Mapira, 2012a)

Table 2.3: EIA Inspections in 2009 and 2010

Province	2009	2010
Harare	202	50
Manicaland	100	505
Mashonaland Central	80	230
Mashonaland East	185	310
Mashonaland North	51	200
Masvingo	30	45
Matabeleland South	435	607
Matabeleland West	170	1350

Source: EMA (2011): EMA's Annual Report for 2010, p.10.

Municipalities and city councils also provide EE while NGOs complement their efforts in some areas, as mentioned previously. The criminalisation of rural people's livelihood strategies, which are based on natural resources such as: forests and wildlife resources, has not helped to reduce environmental degradation in communal areas (Lopes,

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1996).However, the country's new environmental policy (G.o.Z, 2009) seeks to address this problem by making development more people-centred than before.

EE in Formal Education Institutions

The formal education sector includes schools, colleges and universities. It also plays a crucial role in the dissemination of EE at both local and national levels (G.o.Z, 2003).

Primary Schools

During the colonial era and the early days of independence, in primary schools and teacher's training colleges, *Nature Study* and later Environmental Studies (as mentioned previously) were taught (Chikunda, 2007). The current Environmental Science (ES) for primary schools is an integral subject, whose over-all goal is to educate pupils **about** their bio-physical environment (*Environmental Science Syllabus*, 1994). Taking a problem-solving approach, it enables pupils:

"*to investigate such problems as drought, deforestation, air and water pollution and wildlife depletion whilst also developing process skills and concepts in science*" (ES Syllabus, 1994: i).

The ES syllabus is presented in three inter-related but separate segments, which cater for different cognitive levels, namely: Grades 1-3, Grades 4 and 5, and Grades 6 and 7, respectively. It covers nine topics, which are taught in every grade (Mhashu, 1996; Witt and Witt, 2000): water, soil, grass and grazing, trees and forestry, crop plants and animals, health and pollution, energy and fuels, weather, materials and technology, and finally, landforms and maps.

In the teaching/learning process, a balance is struck between the inculcation of scientific concepts and the development of a scientific outlook as well as skills. At each level, the cognitive level of the pupil is taken into consideration. The environment is used as a '*source of learning and as a resource for learning activities*' (ES Syllabus, 1994: ii). The over-all aims of the syllabus are to enable pupils to: acquire scientific knowledge and

skills, develop an awareness of the scientific relationships between people and the environment, inculcate a positive interest in the environment and develop an appreciation of a well-managed environment. It also seeks to enable them to use scientific knowledge and skills to influence and manage the environment, develop an awareness of the usefulness of science in the environment, and encourage creativity and inventiveness in scientific learning and interaction with the environment. Other aims are to: develop positive attitudes to science-learning, science and technology, encourage positive attitudes towards healthy living and hygienic conditions, and develop an inquiring mind geared at problem-solving.

Teaching Methods Employed

The methodology employed in teaching ES at this level is a pupil-centred approach, which lays emphasis on problem identification and problem solving using the environment as a teaching/learning medium/resource (*ES Syllabus*, 1994). The use of field visits and observation is encouraged as it generates curiosity among pupils. On the other hand co-operative learning encourages pupils to exchange ideas in their daily work. By the end of their primary schooling, they are expected to have acquired a sensitive appreciation of their biophysical environment. Some of the activities employed during the teaching/learning process include: games, simulation, experiments, drama, demonstrations, field trips, problem solving, project method and case studies. Pupils are expected to develop skills such as: factual recall, comprehension, application and deductive reasoning during the entire course.

However, a study conducted in a rural setting has shown that most primary school teachers have not reformed their pedagogies in line with the expectations of the ES syllabus (Chikunda, 2007). Caught up in the traditional **neoclassical** pedagogies which are teacher-centred and date back to the colonial era, they often use **trans-missive** methods such as demonstration and simulation games instead of pupil-centred methods like drama, field trips, project method and case studies. Chikunda (2007, 167) further argues that the method employed by most teachers '*is less concerned about learners'*

action and is weak in practical and cultural linkages with the community. The method does not give learners practical hands-on experience in which learners can be involved in action research and community problem solving. The school remains alienated from its community in terms of solving problems'.

Examination Assessment

In the Grade Seven Final Examinations, Environmental Science is assessed as part of the General Paper, which consists of 40% marks for ES, 32% for Social Studies and 28% for Religious and Moral Education (*ES Syllabus*, 1994). The main skills tested are weighted according to the following scale: Factual Recall 40%, Comprehension 30%, Application 20% and Deductive Reasoning 10%. A major problem, which confronts most rural schools in Zimbabwe, is the lack of teaching/learning and financial resources due to poverty at both national and village level (Shumba, et.al, 2008).This has a negative impact on EE as it undermines the development of positive attitudes and lifestyles, which are necessary for natural resource conservation. Since some resources in the environment (such as: timber, wood fuel and other veldt products) are a source of livelihood, conservation efforts are not prioritised, leading to land degradation as communities eke out a living out of it. The criminalisation of people's survival strategies under these harsh conditions has not helped either since it fails to address the root cause of the problem, which is poverty (Chimhowu, *et al* 2010). On the other hand, the overloaded and examination-driven curriculum is another hindrance as it leaves no room for other learning activities such as field trips (Chikunda, 2007).

EE in Secondary Schools

In secondary schools, it is hoped that EE will be integrated in Geography and subjects such as: Agriculture, Biology and Science (G.o.Z, 2003). It will not be taught as a separate subject since the curriculum is already over-loaded. The current O'Level Geography Syllabus (2248) was launched in 1988 and it has several general aims. Firstly, it seeks to encourage an appreciation and sensitive awareness of the environment on a

local, national and global scale. Secondly, it aims to foster an understanding of and develop positive attitudes towards different communities and cultures within our own society and elsewhere in the world. Thirdly, it strives to enable pupils to acquire and apply appropriate levels of knowledge for the benefit of the individual and community within a socialist society. Fourthly, it aims to develop in pupils the skills associated with the selection, collection, representation, interpretation and use of geographical data in a variety of forms.

The fifth aim is to promote in pupils an awareness of spatial and environmental patterns and relationships in the real world, and the dynamic nature of these patterns and relationships. The sixth goal is to encourage pupils to use spatial concepts and apply their principles on a range of scales and in a variety of environments. The last goal is to enable pupils to acquire an understanding of the various economic, cultural and political forces which influence decision making. The syllabus consists of two parts, namely: Physical and Human Geography. Although they can be taught separately, teachers are expected to ensure that pupils understand the links between them. The broad topics for Physical Geography include: Weather and Climate, Landform Studies, Biogeography and Natural Resources. Those for the Human aspect are: Population, Industry, Agriculture, Settlement, Transport and Trade. In addition, pupils are also exposed to basic geographical skills such as: the drawing of sketch maps and diagrams, air photo interpretation, conducting fieldwork, observation, recording and interpretation of geographical information.

It is pertinent to note that the syllabus is silent on lifestyle issues such as taking action for the environment. This apparent contradiction is a major weakness from an EE/ESD perspective (Fien, 1993). However, it is due to the fact that the syllabus is older than the country's environmental policies. Zimbabwe has two policies, which deal with the environment, namely: the national environmental policy (G.o.Z, 2009) and the EE policy (G.o.Z, 2003). According to the latter policy document, the country seeks to '*make sustainable development a national priority, to take a pro-active role in environmental issues and to respond to environmental challenges facing Zimbabwe at the personal,*

local, national, regional, and global levels through education and communication processes' (G.o.Z, 2003, 3). There is an urgent need to infuse EE/ESD aims and concepts into the syllabus so that it matches with the national goals which are stated in the policy document.

Teaching Methodology

The methods employed in teaching geography at this level include: a systems approach, field work, case studies and the use of audio-visual aids such as charts, films and photographs (*O'Level Geography Syllabus*, 2248). The systems approach lays emphasis on inputs, processes and outputs. It is used in conjunction with the concentric approach in which examples are drawn from Zimbabwe and Africa before moving on to other parts of the world. The surrounding school environment is also necessary in the teaching/learning process as it can be used in conducting local field trips on various aspects of geography. However, in Zimbabwe little or no attention has been given to fieldwork and case studies due to financial and time constraints as some researchers have noted elsewhere (Lotz-Sisitka, 2005 and Chikunda, 2007). The lack of a **local context** in the teaching and learning process is a serious weakness which calls for urgent attention if SD has to be achieved in the long term (Ketlhoilwe, 2007).

Examination Assessment Criteria

According to the syllabus, several criteria are used to assess pupil's performance in the O'level Examination. They include: geographical knowledge in the context of scale and areas, the processes underlying physical and human landscapes and spatial patterns, and how landscapes change and may continue to change. Environmental inter-relationships and interactions considered in terms of systems and hence, of multiple and cumulative causes are also included as well as practical geography skills and their application. Basic skills and techniques of personal observation, recording and interpretation, the use of secondary source materials, graphical and numerical presentation of geographical data as

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well as its interpretation, and how to prepare, justify and evaluate solutions to environmental and socio-geographical problems are also assessed.

A major problem of Zimbabwe's education system is its examination bias which has led to congested time tables leaving no room for fieldwork and case study slots (Chikunda, 2007). However, other SADC countries also experience similar challenges as some researchers have noted (SADC REEP Report, 2006). Most of these problems date back to the colonial era and there is a need to re-orient educational systems in order to match them with the new ESD goals (Lotz-Sisitka, 2005). Since this drastic change calls for funds and the necessary political will, most SADC countries are not prepared to move away from their traditional education systems. For example, Zimbabwe's EE policy document (G.o.Z, 2003) recommends the fusion of EE topics in existing subjects instead of over-hauling the whole curriculum.

EE in Tertiary Institutions

In tertiary institutions (colleges and universities), EE has to be infused into the curriculum through subjects like agriculture, geography and science, according to the EE policy document (G.o.Z, 2003). In teacher's colleges, it is also delivered through clubs similar to those of AIDS, Sports, Drama and Music. Due to the voluntary nature of these clubs, EE may not be taken seriously by all the students (Mapira, 2012a). This is likely to undermine the goal of behaviour change among some prospective teachers. For those teachers who do not specialise in teaching geography and science subjects, EE is likely to remain as a peripheral area of the curriculum. It is pertinent to note that recently EE/ESD has been infused in agricultural training colleges throughout the country (Mukute, *et. al*, 2012).

The Mutare Teacher's College Geography Syllabus, which was launched in 1998, is designed for secondary school student teachers who will be able to teach up to O'level (Mutare Teacher's College Syllabus). It comprises four components, namely: Physical, Human, Economic and Social Geography, Practical Skills, Fieldwork and Research, and

Geography Teaching Methodology. Aims of the Geography Course, as outlined in the syllabus, include: producing a good, competent, versatile, committed and resourceful secondary school teacher, widen, deepen and promoting the personal knowledge of student teachers in Geography, enabling students to acquire useful skills so that they can interpret and apply major concepts and techniques of Geography to real life situations, and encouraging students to impart knowledge of sustainable land use management. Just as the O'level syllabus, the document is silent on EE/ESD issues and is not likely to change students' attitudes towards the environment. This is in spite of the fact that the country's EE policy document has been around for more than a decade (G.o.Z, 2003). Obviously, there seems to be a lack of political will to re-orient syllabi so that they reflect the national EE policy (Chikunda, 2007).

Objectives of the Syllabus

The syllabus seeks to enable students to achieve several objectives such as: defining and explaining relevant geographical terms and concepts, demonstrating knowledge of the physical and human processes, and applying relevant principles, theories and models to reality. It also strives to enable students to understand and be aware of the trends and problems in Zimbabwe in particular and the Third World in general, suggest possible solutions to these problems, and understand how processes bring changes in systems, distributions and environments. Furthermore, it is intended to enable them to collect, record, and interpret information from primary (field work) and secondary (for example, statistical data), demonstrate skills of analysis, synthesis and explanation, assess the effects of geographical processes and change on physical and human environments, and finally to competently teach Z.J.C and O'Level geography.

The syllabus comprises five components, which are compulsory and include: Map Work and Teaching Methodology, Geomorphology and Hydrology, Climatology and Biogeography, Population and Settlement, and Economic Geography. While Map Work and Teaching Methodology constitute 40% of the total examination marks, the remaining four components together contribute 60%. It is also pertinent to note that environmental sustainability issues are not prominent in this syllabus just as in the O'level syllabus.

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Hence teachers who are produced are not well equipped to transmit such values to their pupils. Unlike in South Africa where EE/ESD concepts are actually included in course contents (Palmer, 1998), this is not the case in Zimbabwe.

At Great Zimbabwe University (Masvingo City), EE is taught in the form of Environmental Science (*Great Zimbabwe University Prospectus: 2011-2013: General Information and Regulations*). The course is designed for pre-service and in-service teachers who will acquire a Bachelor of Education degree with Environmental Science as their subject of specialisation. The main courses offered (according to the university's prospectus) include: Philosophy of Environmental Science and Environment Education, Principles of Environmental Science and Environmental Education, Environmental Chemistry, Principles of Teaching Environmental Science at Primary School, Research and Current Tends in Environmental Science Education, and Economics of Environmental Science.

In addition some students embark on a research project or dissertation on a chosen topic that is relevant to Environmental Science. Geography and Environmental Science are also offered at the same university for BA and BSc students. Examples of some of the courses offered in these undergraduate degree programmes include: Environmental Education, Environmental Policy and Management, Resource Conservation and Management, Techniques in Geography and Environmental Science, Environmental Pollution and Control, Environmental Impact Assessment, Food Security and the Environment, General Paper in Geography and Environmental Science, and Research Project/Dissertation in Geography and Environmental Science. However, the general lack of EE as degree programmes in the university curriculum implies that environmental issues can never be studied in depth and complexity as Ketlhoilwe and Maila's (2008) study at the University of Botswana has shown.

2.12.0. Significance of the chapter

This chapter has laid a theoretical foundation of the study through a review of EE literature at global and regional levels as well as in Zimbabwe. Case studies, which have been cited, provide a broad perspective of the issues under study. They also shed light on the performance of EE programs at regional and global levels. It has been noted that EE is underway in some formal and informal/non-formal sectors of education in Zimbabwe. This is backed by a well documented policy which was promulgated a decade ago (G.O.Z, 2003). However, the effectiveness of various organizations which provide EE/ESD (at national level) is discussed in subsequent chapters. The chapter has also raised the main issues, which are necessary in addressing the research questions and objectives of the study as well as laying a foundation for the development of the conceptual framework and methodology used in the study.

2.12.1. Summary

This chapter has critically examined how EE and SD concepts have been applied at global level, in East Africa, the SADC region and in Zimbabwe in recent decades. At global level, countries discussed have included: Australia, Canada, China, the UK and the USA. While Australia, Canada and the UK have made huge strides in the development of effective EE programmes, China and the USA have not made much progress due to the lack of political will within their governments, which prioritise economic progress at the expense of environmental considerations. In East Africa, Kenya and Uganda were chosen while in the SADC region, Botswana, South Africa and Tanzania were examined before detailed discussions of Zimbabwean EE programmes were made.

Generally, African countries have a long way to go before they can develop effective EE programmes due to poverty, which forces some people to eke out a living directly from the environment. There is also a lack of political will to take environmental issues seriously in most countries. Another problem encountered is the lack of trained manpower to deliver EE in educational institutions. However, in recent years, SADC REEP in collaboration with the UN has embarked on the training of personnel for

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EE/ESD practitioners in the region (Lotz-Sisitka, 2005). This is expected to gradually improve the manpower situation considerably.

The chapter also discussed how EE programmes have been implemented in Zimbabwe's formal, informal and non-formal institutions such as: schools, colleges, universities, government departments and NGOs. In schools, colleges and universities, the lack of resources has been a major constraint in the implementation of EE projects. On the other hand, government departments such as EMA are under-staffed and this reduces their effectiveness at national, provincial, district, ward and village levels. Furthermore, NGOs are poorly funded and their visibility at grass roots level is limited. This information is important as it has paved the way for a more detailed examination of these issues in the remaining chapters. The next chapter deals with the conceptual framework of the study.

CHAPTER THREE: CONCEPTUAL FRAMEWORK OF THE STUDY

3.0 Introduction

A study of this nature and scope requires a conceptual framework, which integrates all the major issues under investigation. The aim of this chapter is to provide such a framework which guides the researcher in the analysis and interpretation of collected information. An examination of EE programmes at global, regional and national levels reveals numerous inconsistencies (Palmer, 1998). This is due to several factors. Firstly, both EE and ESD are controversial terms, which have generated many discourses and debates at local, national and global levels (Fien, 1993). Secondly, the implementations of EE and ESD programmes tend to vary from one country to another due to the unique needs and aspirations of each country (SADC EE Report, 1999). Thirdly, due to poverty, some countries lag behind others in the implementation of these programmes (Ketlhoilwe and Maila, 2008). Fourthly, some countries lack the political will to implement such programmes even if funds are available (Nkala, 1996). Other considerations include: the national EE programme's orientation to SD (Chikunda, 2007), its implement-ability

(Molapo, 1999), relevance and quality (Ketlhoilwe, 2007), and the presence or absence of EE centres in some countries (Mapira, 2012a).

Within the SADC region for example, while some countries have developed EE policies, others lack the vision to do so (SADC ESD Report, 2006). For example, by 2003 Zimbabwe had already produced and promulgated its EE policy while countries such as, Angola, Botswana and Namibia were still debating the issue. However, although Zimbabwe started well, it lacked the necessary commitment to implement its policy (Chikunda, 2007). For instance, more than a decade after producing a policy document, no EE centres have been established in the country so far (Mapira, 2012a). Cases of wildlife poaching, deforestation, gold panning and veldt fires have been increasing, reflecting the ineffectiveness of EE campaigns in the country (EMA's Annual Report, 2010). If the success of an EE programme is to be measured by behaviour change or people's lifestyles, then the effectiveness of Zimbabwe's programme is questionable. However, it can also be argued that since attitudes take long to change, a long term perspective is necessary before conclusions can be made (Wekwete, 1991).

Existing literature on EE programmes at the global level identifies several criteria for their operations. According to Fien (1993), Palmer (1998), and Molapo (1999) they include: political ideology, EE approaches, government's commitment, resource constraints, policy issues, and society's willingness to sacrifice materialistic goals for the sake of the environment. To this list, one can add another criterion, namely the presence or absence of role models or success stories in the implementation of EE programmes at regional and global levels. Ketlhoilwe and Maila (2008), in their study of higher education in Botswana examine issues of relevance and quality. They argue that ESD programmes should be based on the local context without ignoring external contexts such as national, sub-regional, regional and global dimensions. They should also be *transformative* rather than being *trans-missive*, a view which is shared by Chikunda (2007) in his study of ESD pedagogy in Zimbabwe. Although Ketlhoilwe's and Maila's (2008) arguments apply to higher education they are also relevant to ESD programmes in general. For this reason, they are discussed in detail later on in this chapter.

3.1 Political ideologies

According to Fien (1993) the concept of ideology is crucial in any study which deals with the values and social impacts of EE. Ideology refers to '*any system of ideas underlying and informing social and political action*' (Jary and Jary, 1995: 306). Since they are based on specific political theories, ideologies are not neutral even though they have a profound impact on the type of education a country adopts and pursues (Fien, 1993). Every education system is based on some political ideology and Fien further argues that no education policy is neutral or value free. For this reason an examination of EE/ESD programmes in any country should take this into consideration.

At global level, ideologically oriented approaches include: the vocational/neoclassical, liberal/progressive and the socially critical (Fie, 1993). The first one views education as a form of preparation for the work place. As an agent of socialisation, education selects and trains students for the world of work. However, its main weakness is that it does not question the inherent contradictions in society such as gender, poverty, socio-economic inequalities and the social causes of environmental problems. The liberal/progressive orientation has a broader perspective as it seeks to prepare students for life rather than just the work place. Fien (1993, 22) identifies its goal as that of '*helping students to 'fulfil a wide range of life roles through a broad general education based as much upon the humanities and liberal arts as upon science and technology. This orientation seeks the development and improvement of society through the education of autonomous individuals in whom schools have developed 'a sense of the good, true and beneficial'. The liberal/progressive orientation values individual excellence and achievement. It encourages the need to address social problems and adopts a reformist approach in which the means of social change are seen as already existent in the structures of democratic societies and in the next generation of citizens, presently in schools, receiving a liberal/progressive education*'.

Finally, the socially critical educational orientation, by nature seeks to create a more just and democratic society (Chikunda, 2007). In this way, it plays a **transformative** role

through the production of individuals who are critical, ethical, democratic and responsible in addressing current social problems and actively participate in the improvement of society (Fien, 1993). An appraisal of Zimbabwe's Better Environmental Science Teaching (BEST) programme has exposed its theoretical grounding as well as the ideological contradictions, which underpin it.

According to Chikunda (2007, 168), the BEST programme is '*based on the premise of social constructivism and socially critical orientations, and aims to strengthen community participation education. On the other hand the education system of Zimbabwe is seemingly based on a neoclassical instrumentalist view of education. This approach has created a technocratic mindset that influences the professional character of teachers, and their supervisors… Educators …are assumed to have the right knowledge and capacity to conceptualise on behalf of others with whom they work. Hence, teachers are not comfortable to work with community members whom they think do not possess worthwhile knowledge to be imparted to youngsters. Learners are considered as containers to be filled with knowledge, and reality is regarded as static, changeless and predictable'…Communities appear to have become alienated from the educational system through this process, as they …do not see how they can contribute to learning in schools, and instead project their hopes for poverty relief in the external, longer-term outcomes of education, which they link to urbanisation and modernist views of development*'.

In order to address these challenges, Chikunda further argues that Zimbabwe (like other SADC countries) should **re-orient** its education system so as to match its ESD goals. For example, there is a need to develop closer links between schools and their communities in the teaching and learning processes if the **rhetoric-reality** gap has to be closed. Failure to do so, according to him, is likely to undermine the goal of environmental sustainability in the long run. Since the colonial era, Zimbabwe has shifted from one political ideology to another. This has also influenced the way EE has been conceived and implemented during the country's history. For example, during the colonial era, the Rhodesian government pursued a racist ideology quite similar to that of the former apartheid system

of South Africa (Wekwete, 1991). As a result most government policies including education were designed within a racist perspective.

As noted in the previous chapter, land for agriculture had three racial divisions, including: white commercial farms, APS and TTLs (Whitlow, 1988). EE during colonial times was taught as conservation education, which was the norm during that era (Lotz-Sisitka, 2005). However, the failure to treat the country as a single space economy created problems such as racial conflict, which eventually led to civil strife. The colonial system also created rigid subject divisions which have persisted up to the present day and are now an obstacle to the inclusion of EE due to an overloaded curriculum (Mapira, 2012a).

By the 1970s TTLs were crowded and overstocked leading to land degradation and resource depletion thereby creating an environmental crisis in these areas (Whitlow, 1988). When droughts occurred, such as those of 1964/5 and 1972/3, they had devastating effects on these areas. Apart from dam construction in some areas, no action was taken to save livestock in these areas (Mapira, 2011c). Hence a major problem of the colonial EE programme was the racist system of government under which it was designed. The coming of majority rule in 1980 brought a new political dispensation in the country. This was in the form of socialism, with its emphasis on education with production and the creation of five year plans aimed at achieving national objectives (Patsanza, 1988). Although environmental problems were exposed by some researchers, they were not always attended to due to budgetary constraints at national level. According to Whitlow (1988) they included: soil erosion, gulley formation, deforestation and land degradation in general. By the mid1990s, it had become obvious that the government lacked both resources and the necessary political will to avert the looming environmental crisis (Lopes, 1996).

The adoption of the Economic Structural Adjustment Programme (ESAP) in 1991 marked the end of socialism in Zimbabwe and re-introduction of capitalism as the national ideology. According to Chipika, Chibanda and Kudenge (2001, 1), the '*basic*

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aim of Zimbabwe's economic reform programme was to create an economic structure that relied more on market forces and indirect instruments of economic management than on state intervention to promote economic growth, employment and poverty reduction'. Although ESAP had a life span of five years (1991-95), it was later extended to seven years due to financial challenges such as the 1992 drought, which had a devastating effect on the national economy. As hunger and poverty gripped the nation, some villagers resorted to alluvial gold panning as a survival strategy. This caused river siltation and massive land degradation. A research that was conducted during this period by Lopes (1996, vi) made the following comment and recommendation:

'*Saving the environment, let us be clear, we said, is about saving our environment, the one that allows us to sustain our existence, making safe for us to live in this land. Only when we realise we are all concerned by this environment would we be able to understand the nature of the problem.*

In Zimbabwe, environmental awareness is essential, given the fragility of our ecosystem, ravaged by droughts and other erosions of hope'.

After the abandonment of ESAP, the country continued with capitalism as an ideology and economic policy. Consequently, its apathy towards environmental issues has persisted up to the present day. That is why the fast track land reform programme was never preceded by EIAs as mentioned previously.

3.2 Approaches used in EE programmes

The previous chapter has identified three approaches which have been employed in the dissemination of EE at national and global levels. They include: education **about**, **through** and **for** the environment (Fien, 1993)). The first two approaches are ineffective in changing people's attitudes and actions toward the environment. In Fien's view only the last one has the potential to cultivate positive attitudes and a spirit of stewardship toward the environment. Countries which have employed the first two approaches have

not made much progress while those that have adopted the last one have made significant progress in changing people's attitudes and lifestyles (Palmer, 1998). As mentioned previously, they include: Australia, Canada and the UK. Developing countries on the other hand, have lagged behind due to problems such as poverty and resource constraints (Lotz-Sistika, 2005).

The main goal of EE/ESD is to transform societies from materialism to environmental stewardship (Fien, 1993). Consequently, developing countries such as Zimbabwe should re-orient their attitudes towards the achievement of this goal. Social transformation, as mentioned previously, calls for a change in ordinary people's attitudes towards their environment. A caring attitude implies that communities should develop an environmental ethic, which is geared at the achievement of SD at local, national and global levels (Ketlhoilwe, 2007). In this scenario, schools and communities become change agents as they collaborate in reflexively addressing the environmental challenges which confront them (Chikunda, 2007).

3.3 Political will or commitment

Political will depends on a government's commitment to seriously address environmental issues (Lopes, 1996). The USA, for example, lacks the necessary political commitment as the previous chapter has shown. It is highly materialistic and is not prepared to abandon consumerism for the sake of environmental protection (Palmer, 1998). Although China is a communist country, it is rapidly catching up with the USA in terms of materialism and consumerism. That is why both countries have refused to be bound by the Kyoto protocol and its subsequent versions. As geopolitical super powers, they are setting a bad example to the rest of the global community and some countries are likely to follow their example. The previous chapter has shown that Zimbabwe also lacks seriousness to address environmental issues (Chimhowu, et.al, 2010).

3.4 Resource and policy implementation constraints

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Poverty is a threat to the successful implementation of EE programmes (Ketlhoilwe, 2007). Existing literature suggests that there is '*a direct relationship between poverty and environmental management…Sustainable use and management of the environmental goods and services can significantly aid the fight against poverty and food insecurity'* (SADC ESD Report 4, 2006: v). However, the development and implementation of EE policies call for financial resources, which are generally lacking in most developing economies. With a fatigued global donor community, some countries are not likely to take environmental issues seriously. At the personal level, most people are pre-occupied with survival challenges leading to the neglect of environmental protection (Shumba, et.al, 2008). In a study of his country's EE programme, Ketlhoilwe (2007, 172) argues that:

'*Botswana, like other southern African countries, is facing socio-economic development challenges. It lacks financial capital to provide enough classroom space for learners, to offer satisfactory salaries for teachers, to provide adequate teaching and learning support resources, and many of the parents are unemployed and are not able to contribute to cost-sharing principles'*. Teachers also lack a profound knowledge of EE due to inadequate resources and in-service training programmes. However, existing literature has shown that these problems are also found in other sub-Saharan countries (Otiende, 1997). Obviously, these challenges should be urgently addressed if the goals of ESD have to be achieved. For example in recent years SADC has embarked on a massive participatory project which addresses the scarcity of relevant literature in the region (SADC REEP, 2012).

The project has resulted in the production of a sourcebook which has given the region a '*stronger set of conceptual tools and guidelines that could be used in programmes that were supporting the development of (resource) materials…This strengthened the quality and the outputs of this component of the programme. Numerous materials were still being produced, but with a stronger emphasis on how they might be effectively used to support, and enhance learning'* (SADC REEP, 2012:57).

Another constraint which has been experienced over the years is that of policy implementation. Mapira (2012a, 195) argues that although Zimbabwe has a very comprehensive EE policy document, '*this has not helped the country in its quest for SD*'. This is due to several problems which include: inadequate funding of EMA, under-staffing, corruption among some of the organisation's officials, poverty, scarcity of literature on EE, and lack of alternative sources of energy at the household level. In the formal education sector, there is a need to focus on lifestyle or behaviour change rather than on scientific knowledge about the environment. A study conducted by Shumba, et.al (2008, 81) in one of the country's rural areas shows that '*the community lived in a context of risk and vulnerability where a range of economic, cultural, social and environmental issues and poor quality of education posed a threat to the quality of life. Tensions in the community and between the school and community, lack of solidarity, and the weakening of the traditional…moral and ethical framework contributed to the community's failure to envision and implement interventions towards quality education and towards sustainable development*'.

3.5 Sacrifice of materialistic goals

Most countries pursue their materialistic goals at the expense of environmental protection. They degrade their environment in order to satisfy their material needs, wants or greed (Miller, 1996). Consequently, they are not prepared to develop a sense of environmental stewardship. Such societies pose a threat to environmental sustainability. As result, their EE programmes are weak or ineffective since there is a contradiction between them and people's lifestyles. The absence of green political parties in many developing countries undermines environmental protection at the grass roots level. For example, although EE in Kenya dates back to the 1970s, apathy on environmental issues is still a problem (Otiende, 1997). According to Mukute, et.al (2012), Tanzania is another east African country which lacks the political will to implement its environmental policies. Obviously, such attitudes are detrimental to the success of ESD programmes (Fien, 1993).

3.6 The scarcity of role models

At global and regional levels, there is a scarcity of role models or success stories in the implementation of EE programmes as the previous chapter has shown. Countries with effective programmes (Australia, Canada and the UK) are all industrialised and therefore wealthy. No developing country has made similar progress due to poverty and resource constraints. Although South Africa has made remarkable progress in its ESD programmes, it is one of the major carbon emitters in the world and has not set a good example at global and regional levels (Lotz-Sisitka, 2005). The scarcity of role models at the regional level is likely to de-motivate some countries, which may wish to implement EE programmes.

3.7 Controversy and Complexity of ESD Issues

Within the SADC region, ESD issues are the target of a wide range of stakeholders leading to numerous controversies and interpretations (Molapo, 1999). According to the *SADC ESD Report* (2006: 6), '*Environment and sustainability issues are complex, contested and require multi-disciplinary solutions*'. This has given rise to different views on the implementation of the strategies at the regional level. This has been compounded by differences in the levels of economic development as well as colonial histories among SADC countries (Lotz- Sisitka, 2005). For example, to date Botswana has not yet resolved its ESD policy implementation issues (Mukute, et.al: 2012). However, it has also been argued that due to this diversity, at '*a local community level, sustainable development concerns provide opportunities for integrated learning and action, and thus provide a meaningful context for learning*' (SADC ESD Report, 2006: 6)

3.8 The nature of EE programmes

A programme, which is not oriented toward SD is not likely to be effective in achieving ESD goals. For example, where the emphasis is on teaching **about** and **through** at the expense of **for the environment**, little progress can be expected. The mere acquisition of scientific facts about the environment is not likely to mould environmentally sensitive citizens (Fien, 1993). Molapo (1999) claims that some EE programmes in the SADC region were never designed with implementation in mind. Consequently, they are not

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likely to have a significant impact in the social transformation of ordinary citizens. Furthermore, the lack of EE centres in a country can undermine the dissemination of EE information to members of the public at local and national levels. For example, although Zimbabwe's policy document (G.O.Z, 2003) recommends the establishment of EE centres throughout the country, to date none has been developed indicating apathy at national level (Mapira, 2012a). Another problem is that in some cases no significant reforms have been made so far in order to re-orient the curriculum in order to incorporate ESD issues. For example, neoclassical, exam-driven teaching approaches borrowed from the colonial era still dominate Zimbabwean class room discourses (Chikunda, 2007). Obviously, without a major shift in pedagogical orientation, no major changes can be expected in the implementation of ESD in the country's institutions of learning. Some researchers advocate for a shift from trans-missive to transformative approaches if education has to transform society (Huckle and Sterling, 1996). Finally, ESD discourses should address local contextual challenges if they are to be relevant (Ketlhoilwe, 2007).

3.9 Teaching Approaches and Methodologies

Most SADC countries have not yet reformed their education systems which were established during the colonial era (Lotz-Sisitka, 2005). Derived from **neoclassical** philosophies, these systems can not easily re-adjust to current demands of curriculum change. For example, Chikunda (2007) has noted a contradiction which exists in Zimbabwe's primary education system. On the one hand the curriculum has its roots in the neoclassical methodologies in which the teacher '*knows it all*' and pupils don't. Hence she/he should fill the '*empty vessels*' (pupils). ESD principles, on the other hand, demand a shift from these out dated trans-missive approaches to more transformative methodologies which are pupil-centred. Huckle and Sterling (1996) argue that education should be **socially transformative** if it has to change people's lifestyles. This implies that it should be pupil-centred, participative and problem-oriented (Scott and Gough, 2004). Ketlhoilwe and Maila (2008), on the other hand, advocate for a paradigm shift from trans-missive to transformative pedagogies in Botswana's pursuit of ESD. Consequently, the presence or absence of socially transformative education is viewed as an important criterion for the examination of EE in subsequent chapters of this study.

3.10 Effectiveness of EE programmes

Existing literature on EE and SD at global level has revealed at least three categories of countries (Palmer, 1998). The first group comprises industrialised countries such as China, India and the USA, which generally lack commitment to the goal of environmental protection as shown by their refusal to be bound by the Kyoto Protocol of 1997 and subsequent versions such as those convened in Durban (RSA) in 2011 (*French TV Channel*, 12/12/2011). As the worst carbon emitters in the world, their negative attitude is a cause for concern at the global level. EE programmes in these countries are generally ineffective due to the fact that priority is given to economic development at the expense of environmental protection (Miller, 1996).

The second group of countries includes Australia, Canada and the UK, which have signed the Kyoto Protocol and appear to be willing to sacrifice their materialistic lifestyles for the sake of the global environment. As a result, their EE programmes have to a large extent proved to be effective in promoting SD at local and national levels (Palmer, 2002). The third group comprises developing countries such as those in Africa (Ezaza, 1997). Due to poverty and technological backwardness, most of the citizens of these countries are forced to degrade their environment in order to eke out a living from it (Lopes, 1996). Consequently, their EE programmes are weak and are not likely to achieve SD in the long run. Zimbabwe falls into this category.

In countries where EE has proved to be effective such as: Australia, Canada, and the U.K, three factors have been identified as crucial, namely: the existence of strong Green Political parties or organisations, which lobby for environmental protection, governments which are committed to environmental protection and citizens who are sensitive to the plight of the global environment and are prepared to sacrifice their material needs for the sake of the environment (Palmer, 1998). In more recent years, there has been a growing consensus that there is a need for a paradigm shift in our approach to development issues if the current global environmental crisis has to be averted (Miller, 1994).

According to Lotz-Sisitka (2008, 5) EE should be focused on social transformation so as to '*radically alter our economic and production systems, and ways of living. This requires a paradigm shift. The roots of our present education paradigm the world-over can be traced to the Enlightenment era, which gave birth to science as we know it today and influenced all areas of human thought, activity and institutions. This Enlightenment paradigm is based on the ideas that progress is rooted in science and reason, and that science and reason can unravel the mysteries of nature. It encourages us to 'know' nature in order to use, transform and consume it for our insatiable needs*'.

From this perspective, EE should strive to redefine the notion of progress so that the culture of consumerism, materialism and greed may be shunned by all societies. They should be replaced by values which promote equality, social justice and sustainable living. The transformative role of EE should give birth to radical changes in people's attitudes and lifestyles so as to safeguard our planet Earth against further damage (Miller, 1996). However, researchers are not agreed on the way forward due to the controversy surrounding the EE debate (Fien, 1993). For example, some argue that the new concept of ESD tends to de-emphasise the natural environment in its pursuit of social issues. As Peden (2008, 18), argues, '*Diminishing knowledge in the field of natural science is a concern for some environmental educators and scientists who fear that the shift away from the natural sciences inevitably leads to a shallow understanding of environmental issues*'. However, in this study the thrust is to examine how the EE programme in Zimbabwe strives to achieve SD, notwithstanding the conflicting views surrounding the EE/ESD discourse at national, regional and global levels.

3.11 The Quality and Relevance of EE/ ESD Programmes

As mentioned previously, quality and relevance are important considerations in any study of EE/ESD programmes. Ketlhoilwe and Maila (2008) define quality education as a type of education which has quantifiable set standards and can equip individuals with skills, attitudes and lifestyles, which add value to individuals and the community. Such a form of education enables learners to confront and resolve local, national and global challenges directly. As a transformative (rather than trans-missive) tool, it is a form of empowerment

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as it equips learners with life-long skills which enable them to solve real life problems. It should also be grounded on a firm theoretical foundation that is action-oriented. This should encourage both personal and **collective reflexivity** (Le Grange, 2005). However, Ketlhoilwe (2007) warns that such an education system should not be marred by linguistic jargon (complex terminologies). Rather, it should be action-oriented.

Transformative learning addresses challenges of sustainability (Ketlhoilwe and Maila, 2008). It seeks to achieve several goals. Firstly, it enables students to face real life challenges such as those of environmental sustainability. Secondly, it should transform society since teachers become agents of change as they teach their students. Thirdly, it leads to the re-construction of meaning as it clarifies thoughts and ideas which emerge from teaching and learning processes. Furthermore, it requires teaching methodologies which cater for all levels of cognition (epistemic competence). It should also encourage a paradigm shift and re-orientation of the curriculum and research innovations. Curriculum re-orientation involves challenges of curricular reform so that it addresses local issues and concerns. The content, according to these researchers should be reviewed so that it incorporates social, economic and ecological issues. The local issues may include: culture, indigenous knowledge, gender, poverty, economic systems and sustainable communities. Although these issues have local contexts, they also have broader national, regional and global dimensions. Consequently, students should be exposed to a wide range of viewpoints so that they may realise the complexities of socio-ecological issues in addition to their own views.

Ketlhoilwe and Maila (2008) identified five major criteria that can be employed in the examination of ESD programmes. They include: the local value of the programme, epistemological issues, pedagogical concerns, research issues, and sharing research information and outcomes. These issues can also be used in the examination of national EE/ESD programmes such as that of the Zimbabwean case study. Firstly, ESD should produce citizens who are environmentally sensitive and can be good caretakers of or stewards of the environment. As a vehicle of social transformation, it should promote

positive attitudes, behaviour and lifestyles. Relevant and quality ESD should also lead to a profound knowledge of the environmental problems at local, regional and global levels. For example, in Zimbabwe, it should encourage people to address real life issues and problems such as land degradation, deforestation, pollution, veldt fires and the poaching of wildlife resources.

ESD should also be based on a sound and in-depth knowledge of environmental issues at local, regional and global levels, an issue which calls for a broadening of epistemologies among researchers (UNEP, 2006). Consequently, universities and other tertiary institutions should strive to develop programmes which address ESD at both local and international levels (Ketlhoilwe and Maila, 2008). Such programmes should be based on current epistemologies and pedagogical thinking if they have to be relevant. The designers of these programmes should integrate the local context in them so that they become relevant to societal needs.

According to UNESCO (2005), at national, regional and global levels, ESD discourses have dealt with issues such as: power relations, gender inequality, poverty, health risks and vulnerability, cultural differences, climate change, and information technology. There is also a need to develop teaching methodologies (pedagogies), which are learner-centred, participative and problem-oriented (UNEP, 2006). According to Huckle and Sterling (1996), education should be *transformative* if it has to change people's lifestyles. On the other hand, research-based approaches should involve the investigation of environmental issues and concerns while research projects should address current challenges such as: pollution, waste management and disposal, poverty, gender issues, HIV and AIDS as well as environmental challenges (Ketlhoilwe and Maila, 2008).

3.12 The SADC ESD Programmes

In 2002 the World Summit on Sustainable Development (WSSD) proposed and endorsed the United Nations Decade for Sustainable Development (UNDESD). The decade would run from 2005 to 2014 under the leadership of UNESCO. It was passed through

resolution 57/254 of the UN (SADC ESD Report, 2006). According to the report, UNDESD has four aims. Firstly, it seeks to facilitate networking, linkages, exchange and interactions among stakeholders in ESD. Secondly, it fosters an increased quality of teaching and learning in ESD. Thirdly, it helps countries to make progress towards the attainment of the Millennium Development Goals (MDGs) through ESD efforts. Finally, it provides countries with new opportunities to incorporate ESD into education reform.

In the SADC region, the Regional Environmental Education Programme (REEP) and the Environmental Education Association of Southern Africa (EEASA) are the largest regional networks which support EE practitioners. According to Lotz-Sistika, (2005) there are five MDG goals which are relevant to ESD in the southern African region. They include the eradication of extreme poverty and hunger, the achievement of universal primary education, promoting gender equality and women empowerment, combating HIV and AIDS, malaria and other diseases, and finally ensuring environmental sustainability. All the 191 UN member states pledged to meet these goals. Together these MDG goals set an agenda for the education curriculum in general. They have the potential to root out '*the traditional and colonially inspired 'subject boundaries which still dominate much education in southern Africa*' (Lotz-Sisitka, 2005:31). This is necessary if a paradigm shift has to occur in the region's education systems so that they can incorporate ESD issues more effectively.

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In 2001, African governments adopted the New Partnership for Africa's Development (NEPAD) as a strategy to implement MDG goals. Lotz-Sisitka (2005) outlines three principles of NEPAD which are relevant to ESD in southern Africa. They include: a strategic vision involving broad and deep participation, interdisciplinary responses involving education and an environmental Action Plan focusing on capacity building. According to a SADC report, '*Environment and sustainability issues are complex, contested and require multi-disciplinary solutions. At a local community level, sustainable development concerns provide opportunities for integrated learning and action, and thus provide a meaningful context for learning*' (The SADC ESD Report 4,

2006:6). Hence policy development processes for ESD should take a multi-sectoral approach.

3.13 A critique of the SADC ESD programmes

The SADC ESD programme has attracted heavy criticism from some researchers (SADC ESD REPORT, 2006). Firstly, most countries lack **vision** at the national level in terms of policy review and development. This is not surprising since some countries are still in the process of developing their national environmental policies (Mukute, *et.al*, 2012). Examples are: Angola, Botswana and Namibia. Secondly, laws which support environmental policies are either inappropriate or inadequate as in the case of the Democratic Republic of Congo (DRC). Thirdly, inadequate legislation and implementation as well as bureaucratic red tape are a major challenge as in the case of Namibia.

Fourthly, there is a need to institutionalise SD concerns into the whole education system, which has not yet occurred as in the case of the DRC. A major problem confronting ESD programmes in most SADC countries is that of quality and relevance as some researchers have shown (Ketlhoilwe and Maila, 2008). Molapo (1999) argues that some ESD programmes were never developed with implementation in mind. For example, in a study which focused on Zimbabwe's primary school environmental science programme, Chikunda (2007) noted a rhetoric-reality gap which is a major challenge in the pursuit of SD. This weakness should be addressed at local and national levels if ESD has to yield more positive results in the region.

3.14 Summary

This chapter has provided a conceptual framework for the study by identifying criteria derived from existing literature that can be used in examining a country's EE programme. The criteria, which have been employed in this study include: political ideology, EE approaches, political will or commitment, resource constraints, the nature of ESD programmes in the SADC region (such as complexities and controversies), society's

willingness to sacrifice its materialistic goals for the sake of the environment, quality and relevance issues (Ketlhoilwe and Maila,2008), the existence or absence of role models or success stories in EE policy implementation, a programme's orientation to the achievement of SD, its implement-ability and finally the presence or absence of EE centres in the country. For example, although South Africa has made remarkable progress in its ESD programmes, at global level, it is still one of the major carbon emitters in the world (SADC REEP Report, 2006). This undermines its achievements in the pursuit of ESD at both regional and global levels.

Other SADC countries are still grappling with policy, resource constraints and poverty issues in their pursuit of environmental sustainability goals (Mukute, et.al, 2012). Hence they still have a long way to go before they can achieve ESD at local and national levels. Some of the major challenges which Zimbabwe is facing include: poverty, human resources, and political will on the part of policy makers (Lopes, 1996). The chapter has integrated the main issues which run throughout the study and as the cornerstone of the study, it guides the analysis, interpretation and discussion of the main findings emerging from the research. The next chapter examines the research design and methodology that were employed in this study.

CHAPTER FOUR: RESEARCH DESIGN AND METHODOLOGY

4.0 Introduction

This chapter critically discusses the various methods, which were employed in the collection, analysis, presentation and interpretation of data in this study. This is done in the light of the objectives, research questions and conceptual framework outlined in previous chapters. As mentioned before, the aim of this study was to examine or survey Zimbabwe's EE programme and its implications for SD with a view to making recommendations for their improvement. Issues discussed in this chapter include: Research Design, Archival or Library Research, Pilot Study or Reconnaissance Surveys, Collection of Field Data, Sampling Methods, Interviews, Questionnaires, Document Analysis, Schedule of Events for Data Collection Procedures, and Validity and Reliability of Methods Used.

4.1 Research Design

A research design can be defined as '*the outline, plan or strategy specifying the procedure to be used in seeking an answer to the research question(s). It specifies such things as: how to collect and analyze the data'* (Chritensen, 1994: 293). According to the same author, a good research design has three main attributes, namely: the ability to answer research questions, internal validity and generalize-ability. In this study, a **mixed research design** was employed as it was suited for the tasks which were undertaken. Gray (2011) defines mixed method designs as those that combine at least one quantitative and one qualitative research method. Traditionally, these two designs have been considered as incompatible since they are based on conflicting schools of thought, namely: *positivism* and *interpretivism, respectively* (Jary and Jary, 1995). For this reason, researchers could not integrate them within a single research design (Gray, 2011). However, in recent years, a new research paradigm has emerged, mixed methods research design, thereby bridging the gap between the two traditional designs. This new research

design has the advantage of using the strengths and similarities of both qualitative and quantitative approaches (Punch, 2011).

While quantitative methods focus on the collection of facts, their qualitative counterparts place emphasis on the meanings derived from the facts. This is because they '*contend that truth and meaning do not exist in some external world, but are constructed through people's interactions with the world. Hence for the same phenomenon, two people could construct two quite different meanings*' (Gray, 2011:2001-2). Mixed research methodology is based on the pragmatic school of thought and has been gaining popularity among researchers from various disciplines (Morgan, 2008). A major advantage of the mixed research design is that it allows the researcher to employ quantitative and qualitative techniques either interdependently or independently. For this reason, it is highly flexible and can be used in diverse research projects (Punch, 2011). According to Gray (2011, 204), '*mixed methods research adopts a pragmatic method and system, based on a view of knowledge as being both socially constructed and based upon the reality of the world we experience and live in*'. It employs various techniques drawn from qualitative and quantitative research designs.

Mixed research methodologies enable the researcher to tackle research questions from any relevant angle (Morgan, 2008). However, their adoption as a research design has generated a terminological dispute which revolves around three positions. These, according to Bergman (2011, 272) include: '*Triangulation as a subset of mixed methods; mixed methods as a subset of triangulation; and mixed methods and triangulation as synonyms and, thus interchangeable…Accordingly, it would be least confusing to use triangulation as a type of mixed methods research that aims at convergence*'. This is the view adopted in this study. Consequently, the two terms (mixed research methods and triangulation) are used inter-changeably and mean the same thing.

Cohen, Manion and Morrison (2010, 141) define triangulation as '*the use of two or more methods of data collection in the study of some aspect of human behaviour. The use of multiple methods, or the multi-method approach as it is sometimes called, contrasts with*

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the …more vulnerable single-method approach that characterizes so much of research in the social sciences…By analogy, triangular techniques in the social sciences attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint and, in so doing, by making use of both quantitative and qualitative data'. The same authors outline the advantages of triangulation as a research method. Firstly, it provides a broader view of issues under study compared to single method approaches. Secondly, it removes the bias that is associated with single methods. Thirdly, it builds confidence in the researcher as methods contrast with each other. In this study, various methods of data collection were employed as part of triangulation. They are discussed in the following sections.

Using the mixed research design (or triangulation), the researcher embarked on the collection of large quantities of data through interviews and questionnaires and had the ability to analyze opinions, and attitudes, which are abstract concepts requiring direct inquiry (Barbie, 1989). Jary and Jary (1995:537) define interviews as: '*any research in which* (researchers) *rely on their skills as…interviewer or observer to collect unique data about the problem they are investigating. Researchers may have a list of topics they will discuss with their informants in an unstructured way (a focused interview…) or may seek to uncover the informant's own, narrative or experience of the topic…These methods contrast with Quantitative Research Techniques where reliance is placed on the research instrument through which measurement is made, i.e. the structured questionnaire, the structured observation, or the experiment*'. Semi-structured interviews and questionnaires were employed as they were suitable for the tasks at hand.

A major strength of this method is that it provides '*an accurate description or picture of a particular situation or phenomenon*' (Christensen, 1994:45). For this reason, it is popular among qualitative and quantitative researchers. In this study several qualitative and quantitative techniques were employed in the collection of data that were required in order to answer the research questions that were posed in Chapter One. They included: Library/Archival Research, Pilot Study (observation), document analysis, interviews,

questionnaires, data collation, presentation, description, analysis, interpretation and discussion.

Several advantages of the mixed research design can be noted (Gray, 2011). Firstly, through interviews and questionnaires, it gives an accurate and detailed picture of current trends in the issues under investigation. Secondly, it enables the researcher to capture the opinions and attitudes of individuals or organizations being interviewed or responding to questionnaires. Thirdly, it links theoretical facts in literature with reality in the field of study. It also enables the researcher to collect large quantities of data through interviews, observations and questionnaires. Finally, the methods can also be replicated by other researchers in order to test their reliability validity. According to Christensen (1994), these interviews and questionnaires have several weaknesses including: data collection, compilation and analysis are costly and time-consuming, responses from questionnaires and interviews can be faulty or misleading, and surveys depend on the trust between the researcher and the respondent or subject. Hence, they should be treated with caution.

In order to speed up the collection of data, the researcher employed some research assistants to conduct interviews and questionnaires in areas that were remote such as Chimanimani, Chipinge and Bindura. Although some expenses were incurred in the process, they proved to be worthwhile in the execution of the tasks. In order to ensure that respondents developed trust, the researcher and his assistants took time in explaining the aims of the study and assuring them that their responses would be treated with confidentiality (Annexures 1-4). An ethical clearance letter from Stellenbosch University was presented as supporting evidence. Once the respondents had been convinced, they proceeded to either complete the questionnaires or to respond to interview questions. Those who were unwilling to participate in the questionnaires or interviews were excluded in keeping with Stellenbosch University research ethics regulations.

The following sections discuss in detail the application of the mixed research design in the collection, description, presentation and analysis of data. Techniques employed included: Triangulation, Archival or Library Research, Pilot Study or Reconnaissance

Surveys, Collection of Field Data, Sampling Methods, Interviews, Questionnaires and Document Analysis. Other issues that are included towards the end of this chapter are: Schedule of Events, Validity and Reliability of Methods Used and Ethical Considerations.

4.2 Library or Archival Research

Library or archival research involves the collection of secondary information from published or unpublished sources such as: textbooks, journals, periodicals, dissertations, magazines, historical documents, internet and print media sources like newspapers (Wright, 1996). Library research provides the researcher with a sound theoretical framework for his or her study. Literature research for this study was conducted in university libraries in Harare (University of Zimbabwe), Masvingo (Great Zimbabwe University) and Stellenbosch University in South Africa. The perusal of bibliographies on EE provided the researcher with useful information during the initial stages of the research. But due to the scarcity of information on Zimbabwe's EE programme, archival research proved to be time consuming and demanding. However, it also provided the researcher with the secondary information necessary for the construction of a conceptual framework for the study. Information derived from the study was used in writing the literature review (Chapter Two) and the conceptual framework (Chapter Three) chapters of the thesis.

4.3 Pilot Study or Reconnaissance Survey

Before embarking on the collection of field data, the researcher conducted a pilot study or reconnaissance survey. Christensen (1994, 404) defines a pilot study as: "*An experiment that is conducted on a few subjects prior to the actual collection of data*". In this study, its aim was to establish the feasibility of the planned research design and instruments. It took the form of surveys targeted at some schools, colleges, universities, NGOs and communities involved in EE programmes in the country. Any problems identified during the survey were taken note of and corrected. The information derived from the pilot study was used in redesigning and refining data collection methods and strategies. A major advantage of pilot studies is that they enable the researcher to adequately prepare for the

study in terms of the logistics involved including: time, financial costs, number and size of samples to be taken and other requirements.

The pilot study also gave the researcher the opportunity to test data collection instruments such as: interview guides and questionnaires before the actual field was conducted. In this case, the researcher visited: rural, urban and peri-urban schools, teacher's colleges, universities, NGOs involved in the EE programme, media agents, branches of the Ministry of Environment and Natural Resources Management, some rural and urban communities, and branches of the Environmental Management Agency (EMA). Since the aim of pilot studies is to establish the strengths and weaknesses of planned research methods (Best and Khan, 1994), they perform the following functions: test the validity of research instruments, check on the ambiguity of some questions, reveal areas of weaknesses of the research design or instruments, and standardize research instruments.

4.4 Collection of Field Data

Once the pilot study had been undertaken, the researcher embarked on the actual fieldwork involving the collection of primary data. As mentioned previously, since large quantities of information had to be collected, it was necessary to engage some research assistants who would take part in data collection in the field. Samples were drawn from various parts of the country in order to ensure a national coverage of the information collected. Primary data was drawn from the various sources mentioned previously (such as: schools, tertiary institutions, NGOs, government departments, communities and EMA) using field observation, interviews and questionnaires, which are discussed later in this chapter.

4.5 Document Analysis

In order to complement information derived from secondary (Library research) and primary (Fieldwork) sources, the researcher also analyzed existing documents in the institutions and organizations which were visited. Document analysis involves the extraction of information from written documents such as: course outlines, university prospectuses, school syllabi, schemes of work, lesson plans, teaching aids, written work,

tests and examination materials. Documents are an important part of the education system, reflecting the curriculum in its various dimensions. The syllabus contains detailed information about each subject, covered units or topics, and possible teaching/learning aids. It also gives guidelines on the time frames for the coverage of each unit. Two syllabuses can be identified, namely the national and the school syllabuses with the latter being a modification of the former in order to include examples drawn from the local environment in which a school is geographically located. For example, it may specify the areas where fieldwork or trips can be conducted or which case studies should be chosen.

Schemes of work specify the topics covered on a weekly basis including written work, tests and examinations. They also outline the problems encountered at each stage during the teaching process and how the teacher solved them. Problem and outstanding students may also be mentioned from time to time. They specify teaching and learning aids and sources as well as remedial work given to learners at each stage. Schemes of work are sometimes complemented by lesson plans, which contain detailed information on how a particular lesson was taught beginning with the objectives, progress of the lesson, its conclusion and appraisal or evaluation. It includes the audiovisual aids used, questions asked, activities done and written work given to the learners.

Other important documents that were examined included the teacher's resource book, teaching guidelines, past tests and examination papers. These documents reflected the scope and depth of work covered and the degree of difficulty of written work. In addition examination results were also important as they reflected the performance of candidates at each school or examination centre. They were compared at district, provincial and even national levels. In colleges and universities syllabi and course outlines were examined in order to see the work covered at each stage. The researcher compared documents from different institutions in order to determine whether there were any differences, similarities or common challenges encountered.

Where there were EE clubs or associations, the researcher examined the aims, objectives and activities of such organizations during different terms or semesters. In the case of government departments, NGOs and environmental watch dogs such as EMA, the researcher studied documents showing their goals and community outreaches including the specific areas visited in the past and those planned for the future. In the process, the researcher identified the problems and challenges experienced by each organization or community and how they could be solved.

4.6 Interviews

The researcher administered two sets of semi-structured interviews, one for EE providers such as government officials in the Ministry of Environment and Natural Resources Management and organizations like EMA (Annexure 1) and another for the public (Annexure 2). In practice, there are three types of interviews, namely: structured, un-structured and semi-structured. According to Jary and Jary (1995, 338), structured interviews contain '*set questions which can be easily categorized…(This) format allows ease of analysis and less possibility of interview bias, but the data will not be as rich as that elicited by an un-structured design'.* Unstructured interviews are often used in base line surveys where theories and hypotheses have not yet been developed and depth of the data is more important than ease of analysis.

Semi-structured interviews combine characteristics of both structured and un-structured interviews while exhibiting their strengths and weaknesses. They were chosen because in addition to the use of pre-set questions, they also gave room for open-ended ones where respondents could express their views in any way thereby broadening the variety of information to be collected. Interviews involve the collection of information through dialogue between the researcher and the respondent (Christensen, 1994). They are '*flexible, interactive and adaptable*' (Wiegand, 1996:112). For them to be successful, interviews require three conditions, namely: accessibility between the researcher and the respondent, the respondent should know exactly what the researcher wants, and the interviewee should be cooperative and answer questions both truthfully and accurately.

If the above conditions are not met, the validity of the interview is undermined. For example, if the respondent is unclear as to what the researcher wants, he/she may provide irrelevant information. On the other hand, the respondent may choose to be uncooperative and deliberately provide false information. For this reason, the researcher should create conditions, which encourage trust between him/her and the respondent so that the latter may be cooperative and supply the required information. Some 200 ordinary people were selected from the country's ten provinces using purposive sampling for the administration of interviews. They were chosen on the basis of their willingness to participate in this study.

A major weakness of this method is that it does not claim representative-ness of the population from which it is drawn (Jary and Jary, 1995). However, it is useful where it enables the researcher to get into contact with those sections of society, which are relevant to his/her research goals, as was the case in this study. The provinces chosen for the study included: Bulawayo, Harare, Manicaland, Mashonaland Central, Mashonaland East, Mashonaland West, Masvingo, Matabeleland North, Matabeleland South and Midlands. In each province 20 respondents with equal numbers of male and female participants were chosen in order to achieve gender equity at all levels. However, in the case of EE providers (Annexure 1) such as: government departments, urban councils and NGOs, only key informants were targeted as they were deemed to have the required information.

4.7 Questionnaires

The researcher also administered two sets of semi-structured questionnaires (Annexure 3 and 4) in order to collect information from educators (teachers and lecturers) and learners (students). Questionnaires for teachers and students were administered in all the ten provinces of Zimbabwe. Ten primary schools and the same number of secondary schools were selected from each province after all schools in the provinces had been classified into such categories as: rural, urban, peri-urban, day and boarding institutions (Table 4.1) In each chosen school, ten male and female teachers, respectively, completed the

questionnaires. The same figures were maintained for male and female students in these schools. Although these figures were arbitrary, the researcher felt that they would yield the information that he required.

Table 4.1: Formal education institutions consulted for information during the study

Type of Institution	Numbers selected per province	Total number consulted at national level
Primary schools	10	100
Secondary schools	10	100
Primary Teacher's Colleges	-	5
Secondary Teacher's Colleges	-	1
Universities	-	2
Total	-	208

Source: Field Data

Questionnaires are a common method of data collection. According to Stimpson (1996, 123), they provide '*snapshots at particular points in time of existing conditions*'. As a cheap and quick method of data collection, they are quite popular among researchers from various disciplines. They contain two types of questions, namely close-ended and open-ended. While the former require objective answers selected from a given list, the latter are more flexible as they allow respondents to express themselves using their own words. In this study, both types of questions were used. This is because of the variety of information required. For example, the questionnaire for teachers and lecturers (Annexure 3) requires both objective (Questions 1 to 4) and subjective (5 to 13) responses. While close-ended questions provide objective answers, open ended ones yield subjective responses. Stimpson (1996, 123) outlines the comparative advantages of questionnaires over interviews in the following quotation:

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"*Self-administered questionnaires avoid the high costs of hiring and training interviewers, travel and actually conducting the interviews. Interviews, which are often seen as an alternative, are particularly labour-intensive and time-consuming; in comparison, questionnaires are generally quick to administer and can rapidly sample a large population*".

Questionnaires also give room for privacy and confidentiality especially where sensitive issues are being investigated. Anonymity is guaranteed while their ability to be mailed via post or email makes them a convenient research instrument where distance is a problem. Mbiba (2003) summarizes their advantages as: covering wide areas under study, responses are free from interviewer influence or bias, they are cheap in terms of both time and money, and they are convenient to respondents with busy schedules since they can complete them during their spare time. However, questionnaires have several weaknesses including: in some cases they restrict the respondent's choice of answers especially where close-ended types are employed, and they could lack validity for example where some respondents choose the same answer and yet mean different things (Stimpson, 1996).

Furthermore, the researcher has little or no control over which person answers or influences the respondent. Hence the wrong person can complete the questionnaire. Some respondents may not take the exercise seriously hence their responses lack personal commitment. Without clear instructions and pre-testing during a pilot study they may not be effective research instruments (Mbiba, 2003). Finally, they do not measure attitudes and feelings of the respondent. Although data derived from them can easily be processed using computer packages such as Microsoft Excel and SPSS, their effectiveness as a data collection instrument can be weakened by improper wording, faulty responses and inadequate samples. The researcher minimized these weaknesses during the pilot study. This was done in two ways, namely asking colleagues to go through them and testing them on selected groups of respondents during the pilot study in order to detect any weaknesses in them such as the ambiguity of some questions. Any problems encountered in the process were rectified in preparation for the actual fieldwork.

4.8 Sampling Methods

It has been mentioned that in the administration of interviews and questionnaires, the researcher used purposive sampling. Goodall (1987, 420) defines it as a type of non-probability or subjective sampling in which samples are chosen '*for convenience, arbitrarily and subjectively by the researcher*'. As a result, it does not ensure that every individual or unit has an equal chance of being included in the sample and is therefore likely to be biased and un-representative. A good example of purposive sampling is the case study in geography. According to Shaw and Wheeler (1985, 36), purposive sampling is a type of non-probability sampling in which '*units are selected subjectively by* (a) *researcher, on the basis of background knowledge*'. As a biased method, it is open to criticism. Other researchers define it as a technique, which targets a special group of individuals in a population (Jary and Jary, 1995). It is selective in nature and does not claim representative-ness as in the case of probability sampling.

The method was employed where some sections of society were relevant to the objectives of the study. For example, although EE is a national policy, only a few organizations are directly involved in its implementation such as: educational institutions, EMA, FC, some government ministries and departments, and NGOs. Hence the researcher directed his efforts to them as they were sources of the required information. A major strength of purposive sampling is that it is cheaper and saves time compared to probability sampling. Although it can be criticized for being statistically un-representative, it is convenient in the achievement of the researcher's goals (Goodall, 1987).

Before embarking on the field work, the researcher visited the headquarters of EMA in Harare in order to obtain information concerning the main providers of EE in the country. Having obtained them, he selected five provinces in which the questionnaires (Annexure 1) would be administered. Since the study sought to cover the whole nation, information had to be collected from various parts of the country. However, for logistical reasons, purposive sampling was employed in order to reduce the work load that would have been involved if the whole country had to be visited. The provinces chosen were: Harare,

Manicaland, Masvingo, Matabeleland North and Midlands. In each province members of the following organizations were interviewed: EMA, FC, AGRITEX, PWMA, Urban councils, some NGOs, media sources, Arts and Culture.

In the case of ordinary citizens (Annexure 2), 200 respondents were selected from all the ten provinces of Zimbabwe including 20 individuals (with equal numbers of males and females) from each province (Table 4.2). The division of the country into provinces and different sexes, respectively, facilitated purposive sampling while the chosen individuals were selected on the basis of their willing-ness to take part in the research. A major strength of this sampling method is that it enabled the researcher to reach his targeted respondents thereby achieving his research objectives.

Table 4.2: Areas in which public interviews were conducted

Name of Province	Districts/Areas
Bulawayo	Ascot, Luveve, Mpopoma
Harare	Highfields, Mbare, Tafara, Waterfalls
Manicaland	Chimanimani, Chipinge, Nyanga, Rusitu
Masvingo	Chiredzi, Chivi, Gutu, Bikita
Mashonaland Central	Guruve
Mashonaland East	Mutoko
MashonalandWest	Kadoma
Matebeleland North	Lupani
Matebeleland South	Beit Bridge
Midlands	Gokwe, Mberengwa, Shurugwi, Zvishavane

Source: Field Data

One questionnaire document (Annexure 3) was used for teachers and lecturers since it sought to collect similar information. Ten teachers (five males and an equal number of

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females) were selected from each of the ten primary and ten secondary schools in each province. Again, only those individuals who were willing to participate in the study were chosen. There were two reasons for the choice of this strategy. Firstly, it ensured full cooperation from the respondents since they had volunteered to take part in the study. Secondly, it was done in order to adhere to the ethical demands of the study as stipulated in the ethical clearance letter that was provided by Stellenbosch University. At national level, the number of respondents was one thousand. However, lecturers were drawn from five primary teacher's colleges (out of ten in the whole country): Masvingo, Mogernster, Mukoba, United College of Education and Nyadire. The five colleges included three state-run and two privately owned institutions. This diversity was essential as it gave a true picture of teacher's colleges in the country. In each college twenty respondents including an equal number of males and females completed the questionnaires.

Only one secondary teacher's college was chosen, namely Mutare out of the three in the country (the other two being Belvedere in Harare and Hillside in the city of Bulawayo). Again, some twenty respondents completed the questionnaires (Annexure 4), maintaining gender equity as usual in this study. Agricultural training colleges were not included in the study as they were at various stages of the process of introducing EE at the time of the fieldwork (Mukute, et.al, 2012). Only two universities were chosen namely: the Masvingo city based Great Zimbabwe University (GZU) and the University of Zimbabwe (UZ) in Harare. In this case only faculties of Agriculture, Arts, Education and Science were targeted since they were the only ones, which provided EE. Ten lecturers (five men and five women) and twenty students (with gender equity) completed the questionnaires giving totals of 20 lecturers and 40 students, respectively.

4.9 Schedule of Events for Data Collection Procedures

Table 4.3 provides a summary of data collection events and procedures throughout the study. Interview guides and questionnaires are found in the Annexure (1-4) as previously noted.

Table 4.3: Schedule of events for data collection procedures

Dates	Activities	Objectives	Purpose	Sources/Instruments
March 2011-July 2012	Library or archival Research	Build a theoretical foundation for the Study	Collect information for the Literature Review Chapter	Libraries and the Internet
August 2012	Choice of Research Design	Develop a suitable research methodology for the study	Write methodology Chapter	Secondary sources of information such as libraries and the internet
September 2012	Pilot Study	Test the suitability of methods chosen for the study	Refine research instruments such as interview guides and questionnaires	Field
October-December 2012	Document Analysis	Collect information on the daily activities of EE providers and learners	Assemble data that will be used in shaping the researcher's opinions concerning the EE programme in the country.	Schools, colleges and universities
October 2012-May 2013	Interviews and Questionnaires	Collect primary data for the study	Gather information for presentation, discussion, analysis and interpretation (Chapter Four)	Field Sources
June- August 2013	Data analysis and presentation	Analyzing primary data and interpreting it	Write Chapters Four, Five, Six and Seven	Data collected from the field
September- October 2013	Drawing Conclusions, Making Recommendations, Submission of Thesis to Examiners and Defending it.	Concluding the study And sending the product to examiners	Submitting the completed study in preparation for the examination	All data collected during the study including secondary and primary information.

4.10 Data Presentation, Interpretation, Analysis and Discussion

The information that was collected from the field included both *qualitative* and *quantitative* forms of data, which had to be analysed, interpreted and discussed. This variety in the types of information collected was in keeping with the chosen research design (*Mixed Methods Design*). The analysis was preceded by activities such as organising, breaking down and moulding data into categories, which reflected recurrent

themes, which emerged from the field. Excerpts from questionnaires and interviews were recorded as evidence of respondents' views, ideas and beliefs of the issues under investigation (Ramukumba, 2010). The data collected from the field was analyzed in the light of the research questions and objectives, which were outlined at the beginning of the study while the presentation was in the form of descriptions and discussions accompanied by tables and figures where necessary.

The analysis focused on addressing issues such as research questions, objectives and the conceptual framework which had been raised in previous chapters. It also sought to suggest solutions and recommendations for the issues and problems, which had emerged from the study. Once the data had been collected through questionnaires and interviews, the analysis and interpretation took phases or stages, which included: *collation, description and documentation, categorization, analysis,* and *synthesis* (Ramukumba 2010). During the first phase, data from the field was organised into manageable formats in order to facilitate a systematic analysis. The data was fed into the computer in the form of tables, figures, quotations and descriptions.

The second phase involved the reduction of data into research themes which ran through the study. Information from interviews and questionnaires was collated and analysed in order to establish the over all *meanings* and *implications* while in the third phase, the data was analysed in order to identify *recurrent themes, ideas* and *patterns* (Leininger and Mc Farland, 2002). The thrust of the third phase was to develop and clarify concepts, which were relevant to the study (Cohen, *et.al*, 2001).The data was organised into groups, subsets, categories and recurrent themes such as: *definitions, activities, achievements, problems/challenges* and suggested *solutions* for EE/ESD. The final phase involved data synthesis and interpretation in which the researcher embarked on creative reflection and abstract thinking so as to synthesise the meanings that emerged from the collected data (Ramukumba, 2010). Once this had been done, the researcher proceeded to write the remaining chapters (Five to Eight) in the light of the above considerations.

4.11 Ethical Considerations

Researchers have a potential to violate or abuse the rights of their subjects or participants, hence the need to ensure that they do not do so in their search for information (Neuman, 2000). Stellenbosch University, in keeping with global trends, has guidelines on the ethical conduct of researchers in various faculties. Hence before embarking on fieldwork, the researcher sought for clearance from his department, Curriculum Studies, and the Research Ethics Committee (Human Research) via the Departmental Ethical Screening Committee (DESC) of the Department of Curriculum Studies (Stellenbosch University). Although this study was not likely to violate the rights of respondents in expressing their opinions and attitudes through interviews and questionnaires, the researcher had an obligation to abide by the code of ethics in his department and university. He also had to assure his respondents of the confidentiality and anonymity of their responses. According to the Standard Operating Procedure (SOP) Draft 15 of the Research Ethics Committee: Human Research (Stellenbosch University) of 2011: 6:

'*The responsibility to conduct ethically responsible research lies in the first place with the researcher, supervisor and departmental chair…*

In particular, researchers are required to develop an ethical orientation and internalisation of ethical principles and practices…This internalised ethical orientation should guide the researcher in every step of the research, instead of following a mechanistic, checklist or blueprint approach to the ethics of research'.

Since 1953, the American Psychological Association (APA) has developed a code of ethics for its researchers. Most of its principles have been adopted in various parts of the world including South Africa and Zimbabwe. According to Best and Khan (1993), they include: i*nformed consent, invasion of privacy, confidentiality, protection from physical and mental stress, harm or danger, and knowledge of the outcome.*

Firstly, the researcher should ensure that his/her subjects or participants are fully aware of the purpose of the study and no information has been hidden from him/her. Hence the

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decision to participate in the research or to provide the required information is based on true facts. Secondly, it is unethical for researchers to invade on people's privacy without their knowledge and consent as this violates their individual rights as human beings. The researcher should respect the confidentiality of his/her findings and should not betray it. This includes maintaining anonymity of all responses from respondents. Thirdly, efforts should be made to safeguard the subject's well-being against any possible danger. Finally, the researcher should be prepared to inform his subjects about the results of his/her work and where they have been published.

Christensen (1994) goes further to list ten principles, which guide APA in its conduct of ethically based researches. Firstly, the researcher should evaluate the ethical acceptability of his/her research before embarking on it so that it does not violate human rights. Secondly, there is a need to consider the degree of potential risk that is associated with the study so as to minimize it for the protection of participants or subjects. Thirdly, the researcher is entirely responsible for the respect of ethics in his/her study. Fourthly, a clear and fair agreement should be established between researchers and participants before the research begins.

Furthermore, deception of participants should be avoided and no information should be hidden from them concerning the study. The participant or subject should be free to decline or withdraw from the research any time when he/she feels like. The researcher should also protect the participant from any potential harm, including physical, mental or emotional. It is the duty of the researcher to inform the participants about the results of their study. The researcher is entirely responsible for any un-desirable consequences of his/her research on the participant or subject. Finally, information derived from the study should be kept in strict confidence unless the participant agrees that it should be disclosed.

In the administration of interviews and questionnaires, the researcher ensured that all the above ethical considerations were taken into consideration. This would protect respondents against any possible human rights abuse thereby creating a cordial

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relationship between them and the researcher. For example, the researcher introduced himself to the subjects or respondents and clearly explained to them about his intention and the nature and purpose of his research (see Annexure 1-4). In the process, he showed them the letter and student I.D. from his supervisor and university, respectively. Thereafter, he requested for permission to administer interviews and questionnaires. Individuals, respondents and organisations/institutions had the freedom to agree to his request or not. If they agreed, then he could proceed with his data collection exercise. If not, he could not proceed until the necessary permission was granted.

However, throughout the primary data collection (field work) exercise, he bore in mind that

'*complex and often unanticipated issues related to ethically responsible research may emerge during the course of research in contested, highly diverse and fluid situations, and that there are seldom straightforward ethical guidelines that the researcher can refer to in order to determine what the "right thing" is to do under such circumstances. Researchers should also note that uncertainty may exist about ethical risk in research, and that the nature or levels of risk can change during the research process, something that is often not predictable at the onset of the research*' (Standard Operation Procedure (SOP): Research Ethics Committee: Human Research (Draft 15, 2011:6) (Stellenbosch University). In the light of the above facts, the researcher had to use his discretion and to exercise caution throughout the fieldwork so that ethical considerations were given due respect.

4.12 Validity and Reliability of Methods Used

It is pertinent to assess the validity and reliability of methods employed in a study of this nature. While validity refers to the effectiveness and trust-worthiness of given research methods, reliability is the '*extent to which the same results are obtained when responses are measured at different times*' (Christensen, 1994:201). As a subset of the mixed research design, triangulation was employed in this study through the '*employment of a number of different research techniques, in the belief that a variety of approaches offers*

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the best chance of achieving validity' (Jary and Jary, 1995: 698). Haralambos and Holborn (1995) define triangulation as the fusion of several approaches so that their different strengths can be utilised. For this reason, qualitative and quantitative methods should not be viewed as mutually exclusive.

In this study, the researcher employed a variety of techniques in order to take advantage of their individual strengths. As mentioned previously, the researcher started off by conducting archival or library research in order to establish a theoretical foundation for the study. Without a sound theoretical framework, no study of this nature can be justified or withstand criticism from informed readers. Once the literature survey had been completed, the researcher proceeded to write the literature review chapter or Theoretical Framework of the Study. This was followed by the choice of a conceptual framework and a mixed methods research design, which was considered to be suitable to the study as mentioned previously.

A pilot study was also conducted in order to test the validity of interviews and questionnaires to be administered in the field. The content validity of interview guides and questionnaires was achieved by giving them to some experts and colleagues who checked whether they agreed with the questions posed. Once these documents had been approved, the researcher embarked on the pilot study for further testing. Any problems that were identified were rectified before the research instruments could be administered in the actual field. Since it would be impossible for the researcher to study the whole target population, it was necessary to draw up samples from relevant sources in the field such as: EMA, government departments, urban councils, NGOs, ordinary people, schools, colleges and universities.

Document analysis provided detailed information on EE course outlines, syllabi, schemes of work and lesson plans in different institutions including schools, colleges and universities. Through interviews and questionnaires, the researcher collected information on the views of teachers, students, government officials, NGOs and the public. Such information was crucial as it provided data on the issues under investigation. Methods

employed in this study were chosen on the basis of their assumed potential to enable the researcher to achieve the objectives outlined at the beginning of the study. Ethical considerations were also addressed so that participants or subjects were not endangered by methods employed during the study. Before embarking on fieldwork, the researcher requested for clearance from his department so that his data collection methods were approved. This ensured that they were in keeping with the ethical standards of Stellenbosch University. Thereafter, the researcher conducted his fieldwork in line with the Standard Operating Procedure outlined by the Research Ethics Committee (Draft 15: Human Research: 2011) of Stellenbosch University.

4.113 Summary

The chapter has discussed the research design and methods, which were employed in this study. A *mixedresearch methods approach* was used including: qualitative and quantitative techniques. The chosen research design falls under the *pragmatic school of thought* (Morgan, 2007). Library/archival research, pilot/reconnaissance survey, collection of field/primary data using interviews and questionnaires, document analysis and sampling methods were also employed. After outlining the schedule of events for the study in a table, the chapter discussed issues such as: data presentation, interpretation, analysis, and ethical considerations of the methods used during the study. Ethical issues are crucial as they have a bearing on the respect of human rights. Hence, they were addressed in this chapter. In the administration of interviews and questionnaires the researcher had an obligation to adhere to a code of ethics that has been adopted at international level as well as by Stellenbosch University. The researcher sought for clearance from his department and the University's Research Ethics Committee before embarking on data collection in the field. The chapter ends with a brief discussion of the validity and reliability of methods that were employed. The next chapter describes the main findings that were drawn from non-formal and informal organizations, which provide EE in Zimbabwe.

CHAPTER FIVE: EE IN THE NON-FORMAL AND INFORMAL EDUCATION SECTOR OF ZIMBABWE

5.0 Introduction

This chapter presents the main findings of the study through a discussion of the activities of various organisations which provide EE in Zimbabwe. This is done in the light of the research questions, objectives and the conceptual framework which were presented in previous chapters. According to Mandishona (1996), Zimbabwe's environmental crisis during the mid-1990s stemmed from a combination of four factors including: rapid population growth, rural poverty, dependency on the environment for survival and the lack of a sound legal framework on environmental management issues. Some of the problems emanating from this crisis included: deforestation, desertification, soil erosion, biodiversity loss, pollution and climate change. Existing literature shows that two thirds of Zimbabwe's population depends on wood fuel, indicating that the country '*has not adequately dealt with the key issue of channelling investments flows to address the crisis of rural energy. As a result, the fuel wood sector poses the most glaring manifestations of an unstable consumption of environmental capital, i.e. biomass*' (Chandiwana, 1996: 89).

At the turn of the century, a new legal frame work was formed through the enactment of the Environmental Management Act (Chapter 20:27) of 2002 (Gandiwa, 2004). The new Act gave birth to an environmental management agency (EMA), which became a watch dog agency of the country's environment. One of EMA's goals is to provide EE to the public in collaboration with other non-formal and informal organisations (G.o.Z, 2003). Non-formal and informal organisations, which provide EE in Zimbabwe according to the EE policy document (G.o.Z, 2003), include: some Government Ministries such as that of Mines and Mining Development, Government departments including EMA, FC, AGRITEX and PWMA, Urban Councils, EE Centres, Media, Youth, Arts, and Culture. However, since EE centres have not yet been established in the country, they are not discussed in this chapter. On the other hand, since activities of the youth are adequately covered under Arts and Culture, there is no need for another section on them.

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The main providers of EE among ordinary Zimbabweans are: schools, universities, colleges, EMA and NGOs (G.o.Z, 2003). Information collected from the field (Annexure 2) shows that while the formal education sector (including schools, colleges and universities) is the main provider of EE in the country contributing 83.8%, the informal and non-formal education sector accounts for only 16,2% of the total (Figure 5.1). Two reasons probably account for this disparity. Firstly, the formal educational sector is better equipped in terms of material resources (class rooms, libraries and teachers), and more visible while non-formal and informal organizations lack both resources and visibility at the local level due to under-funding and associated resource constraints (Mapira, 2012a).
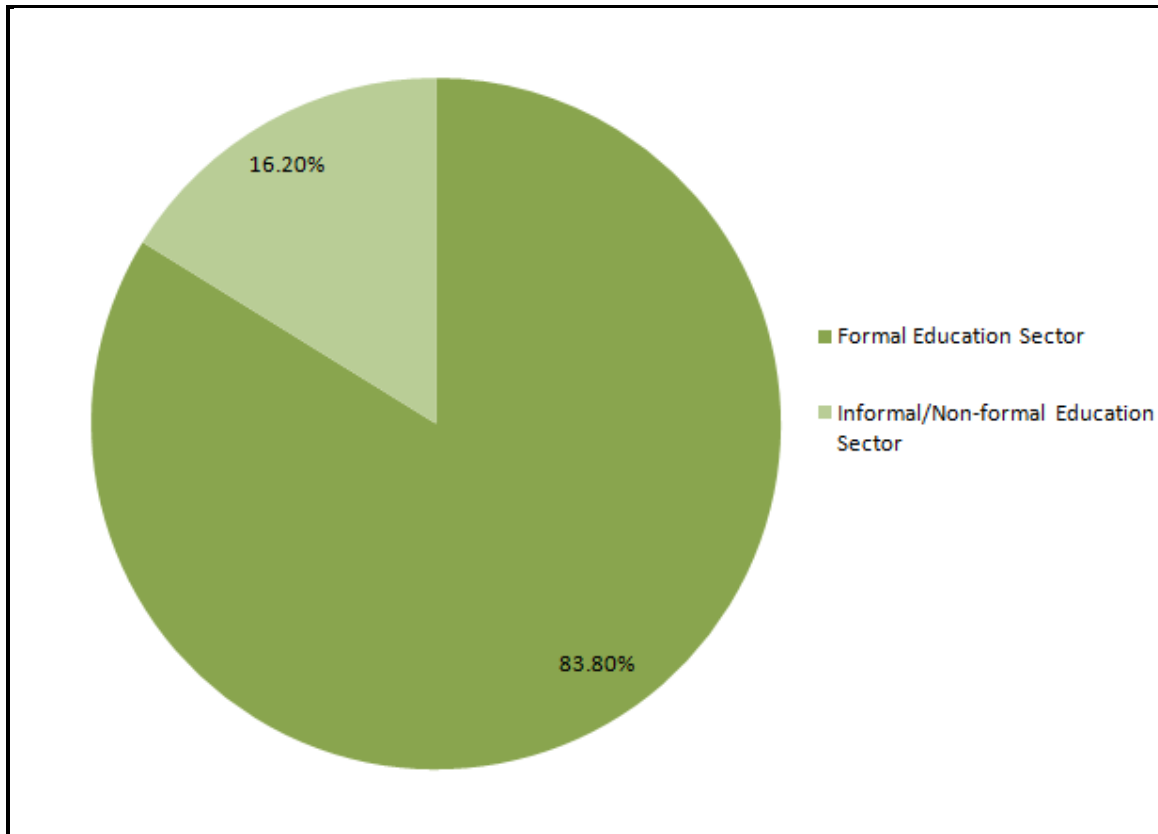
Figure 5.1: Main Providers of EE in Zimbabwe

The main providers of EE are listed in tabular form and ranked in order of their importance at the national level (Table 5.1). It is pertinent to note that most (60%) of the EE has been received during the last ten years, reflecting an increase in the number of awareness campaigns during the last decade (Annexure 2). If this trend continues, more

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positive results can be expected in the long run. It should be remembered that EMA is quite new dating back to 2007, when it was established (G.o.Z, 2009). Already, its impact is beginning to be felt in some parts of the country. Consequently, given more time and resources, it is expected to yield better results in future. Since it works in collaboration with other government ministries, departments and some NGOs, it has the potential to exert more impact especially at the grass roots level.

Table 5.1: Main sources of EE for members of the public

EE Provider	No. of people reached	%	Ranking
Primary schools	100	32.3	1
Universities	70	22.6	2
Secondary schools	60	19.4	3
Teacher's colleges	30	9.6	4
EMA	30	9.6	4
NGOs	20	6.5	6
Total	310	100.0	-

Source: Field Data

From the field data, issues covered by these EE campaigns included: tree planting and conservation, deforestation and land degradation, water resources conservation, environmental impact assessments (EIAs), environmental awareness issues, achieving a sustainable environment, greenhouse effects on the ozone layer, soil erosion and conservation, negative effects of mining, wildlife protection and management, air and water pollution, veldt fires and their negative effects: prevention and control measures, protection of natural resources. Since these issues fall under environmental management, they should not be equated with EE/ESD as Ketlhoilwe's (2007) study of EE policy implementation in Botswana has shown. EE/ESD as mentioned previously, is geared towards changes in attitudes, behaviour and lifestyles (Fien, 1993), something that is still lacking in Zimbabwe as this study shows. That is probably why in spite of these

developments, reports from EMA officials and the print media show that cases of veldt fire outbreaks and wildlife poaching have been on the increase in recent years (EMA' Annual Report, 2010).

For example, some 90 elephants have been killed recently by poachers who used cyanide to poison drinking water sources in the Hwange National Park (*The Sunday Mail* 29 September, 2013, page D6). The aim of the poachers has been to cut off elephant tusks for sale outside Zimbabwe. Obviously, the desire to make ill-gotten wealth out of wildlife resources is a major motive. This corroborates the view that in developing countries such as Zimbabwe, due to either poverty or greed, some people lack a sense of *ecological stewardship* and are not prepared to *sacrifice their materialistic goals* for the sake of environmental protection (Palmer, 1998). The occurrence of such poaching activities involving the use of cyanide also reflects the need for more effective EE awareness campaigns among Zimbabweans in general. The following sections discuss the contribution of various non-formal and informal organizations in the provision of EE in Zimbabwe.

5.1: The role of the Ministry of Mines and Mining Development

The mining industry plays a pivotal role in Zimbabwe's economy. According to Munowenyu (1996), there are over 40 minerals in the country. Mining falls under the Ministry of Mines and Mining Development. As mentioned previously, mining operations in Zimbabwe are governed by the Mines and Minerals Act (Chapter 21:05) of 1996. The Ministry seeks to achieve several goals, including: promoting the sustainable exploitation of minerals in the country, encouraging the prudent management of mining environments for the benefit of present and future generations, conducting inspections so as to ensure that mines comply with statutory regulations that govern mining operations, provision of explosives, permits and licences to mines, and encouraging the dissemination of EE/ESD in all mines and mining environments. Some of the existing mines in the country are listed in the following table (Table 5.2).

Table 5.2: Some of the existing mines in Zimbabwe

Name of mine	Mineral extracted
Renco	Gold
Mimosa	Platinum
Murowa	Diamonds
Bikita Minerals	Lithium
Sandawana	Emeralds
Gaths and Shabanie	Asbestos
Sabi	Gold
Zialndia	Gold
Three Gem	Gold
Dorowa	Phosphate

Source: Field data

The main activities of the Ministry of Mines and Mining Development

According to information that was collected from interviews (Annexure 1), the main activities of the ministry include: mine visits and inspections, promoting safety at all mines, providing mines and prospectors with legal documents such as licences, rendering technical and environmental advice to miners, registration of mines and mine claims, resolving disputes among miners and other stakeholders, and encouraging individual mines to provide EE/ESD to their workers and surrounding communities. Examples of mines, which are involved in the provision of EE/ESD (according to information derived from interviews) include: Bikita Minerals, Mimosa and Murowa. Apart from distributing EE literature, they also encourage surrounding communities to form environmental clubs. However, other mines have not done much to improve the plight of their surrounding communities due to resource constraints. Murowa has gone further to electrify neighbouring schools, shopping centres and clinics thereby reducing their dependency on wood fuel. Although these activities bear some aspects of EE (such as literature

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distribution), they are mainly geared at environmental management/protection and should not be mistaken for EE/ESD as Ketlhoilwe's (2007) study has shown. It should be remembered that the main goal of EE/ESD is to enable communities to develop a sense of environmental stewardship at local, national, and global levels (Palmer, 1998).

In some cases, such as those of Buchwa (iron ore) and Vanguard (asbestos) in the Mberengwa District, no attempt was ever made to re-habilitate the environment when the mines closed down owing to the depletion of the respective minerals (Mapira and Zhou, 2006). This is in spite of the fact that Government policy demands the rehabilitation of mining environments as part of the de-commissioning exercise (Chiwota and Hauge, 1996). The failure of the Zimbabwean government to prosecute the offenders also reflects apathy on the part of policy makers. Although Buchwa Mine closed down in 1996, to date the Zimbabwe Iron and Steel Corporation (ZISCO) has not been brought before the courts. This is probably due to the fact that it is owned by the government and no one is prepared to venture into litigation wrangles with the State. The villagers whose environment was damaged have now resorted to gold panning on the banks of the nearby Ngezi River (Mapira and Zhou, 2006). Even though they risk arrest by the police, they have no other means of earning a living due to the plight of their damaged environment. This confirms the belief that poverty is one of the root causes of environmental degradation (Chenje and Johnson, 1994).

According to field data, the main challenges, which the Ministry of Mines encounters in the delivery of EE/ESD at national level include: *scarcity of literature in the form of pamphlets, brochures and posters, lack of vehicles for transport to visit mines, general lack of electricity, which forces some mines to rely on coal and wood fuel for energy, and lack of environmental stewardship among miners and mining communities, which leads to apathy on environmental issues*. Since the mining industry is valued for its contribution to the economy and for employing thousands of people, the government is caught up in a dilemma. Forcing all mines to implement its policies would result in the closure of those that cannot afford to do so. However, allowing the situation to go un-

checked has disastrous environmental effects as studies have already shown (Munezvenyu, 1992).

Possible solutions that were suggested by the Ministry officials include: *the provision of EE/ESD literature to some mines and their surrounding communities, electrification of all mines so that they do not have to depend on wood and fossil fuels, developing environmentally friendly communities through the dissemination of EE/ESD, using stiffer penalties for environmental crimes such as deforestation, gold and diamond panning, effective use of resources, for example the re-cycling of used materials like plastic containers, tyres and metal buckets, land reclamation involving affected communities and some stakeholders, and provision of rewards to those communities, which engage in environmentally friendly activities*.

However, some studies have shown that since Zimbabwe is desperate for investors, any attempt to be strict on environmental issues is likely to scare them away (Chiwota and Hauge, 1996). Consequently, the country has tended to play down on environmental compliance in a bid to attract potential foreign investors. That is why the implementation of environmental impact assessments (EIAs) has not always been consistent in the country since 2000 (Mapira 2012a). Obviously, this has negative effects on the implementation of government programmes such as EE. However, this problem is not peculiar to Zimbabwe as it has been reported elsewhere in the developing world (Miller, 1996).

5.2 The Role of EMA in the Provision of EE in Zimbabwe

EMA was established in 2007, five years after the promulgation of the Environmental Management Agency (Chapter 20:27) in 2002 (GoZ, 2009). This was achieved through the merging of three government departments (www.ema.co.zw), which included: the Natural Resources Board (NRB), which had originated from the colonial era, the Zimbabwe National Water Authority (ZINWA) Water Quality Section, and the Ministry of Health and Child Welfare's Hazardous Substances and Atmospheric Pollution Sections. As an environmental watch dog agency, EMA is empowered to '*regulate,*

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monitor and promote (the) sustainable management of natural resources and the protection of the environment with stakeholder participation' (EMA's Information Brochure, 2010). In the execution of its mandate, the agency works in partnership with other government departments such as: FC, urban councils, NGOs, industry and commerce.

However, due to resource constraints, EMA has not yet forged links with other providers of EE such as: AGRITEX, PWMA and the Ministry of Mines and Mining Development according to information derived from the field.   Although EE is not their core business, these organisations play an important role in supporting the agency in the execution of its mandate. In order to achieve its aims, EMA has formulated five goals (www.ema.co.zw): including: creating an enabling legal framework for improved environmental management, providing a reliable and easily accessible environmental information system for improved decision making, developing into an effective, efficient and dynamic self sustaining organisation, ensuring a clean, safe and healthy environment and the sustainable use of natural resources, and promoting environmental stewardship at all levels. EMA provides EE through awareness campaigns, which target ordinary citizens in rural, urban and peri-urban areas. It also plans to establish EE centres throughout the country as a strategy for disseminating environmental information to the public (G.o.Z, 2003).

EMA's Activities

Information collected from interviews reveals some of the activities conducted by EMA in an attempt to promote EE and ESD. This includes organising annual inter-school debates and competitions at district and provincial levels. For example, the provincial contests for 2012 were held in September at Masvingo Teacher's College in the city of Masvingo. EMA also sponsors environmental modelling and beauty pageants at provincial and national levels. The national event was held in November 2012 in the city of Masvingo. The agency also organises environmental exhibitions at agricultural shows at both provincial and national levels as well as the publication and dissemination of EE

information through print (newspapers, posters and magazines), and electronic media (radio, television and the internet).

In addition, it has been holding road shows at local level and conducting meetings, seminars and workshops, which target specific communities in rural, urban, peri-urban and resettlement areas. Other activities include commemorating significant days on EMA's calendar, conducting environmental awareness campaigns in targeted areas and communities, holding clean up campaigns in towns and cities, conducting media tours so as to educate the public on EE issues, and inspecting and demanding fines for motor vehicles and industries with excessive carbon emissions. EMA has also conducted environmental quality inspections, which target water and effluent, solid waste and hazardous substances. For example in 2010, 1724 inspections of sewage treatment plants were made resulting in the issuing of 117 fines. However, in spite of these measures, '*water pollution levels remained high as most local authorities continued to experience problems of sewer bursts*' (EMA's Annual Report, 2010:16).

EMA's recent Achievements

According to information collected from the field, EMA has made significant progress in recent years. This includes improved community participation in environmental issues at local, district and provincial levels and an increase in the number of environmental management and EE projects initiated by communities such as water harvesting. Publicity of environmental crimes has also been realised among communities leading to the formation of environmental protection and management lobby groups in some parts of the country such as Manicaland. In addition, there has been increased cooperation between EMA, some NGOs and the two ministries of education in the country (Ministry of Primary and Secondary Education and Ministry of Higher and Tertiary education).

Improved coordination between EMA and traditional leaders (chiefs and kraal heads) in issues of environmental management, and the increased number of EIA inspections at local and national levels are positive developments in the country's quest for SD (Figure 5. 2). For example, according to EMA's annual reports (2009 to 2011), in 2008 a total of

1441 EIAs monitoring inspections were conducted at national level. A year later, 192 inspections were conducted compared to 205 in 2010. Other projects, which were conducted in recent years, have included ecosystem protection activities such as: wetland protection, monitoring veldt fires, land degradation inspections, deforestation, sand, and clay abstraction, and transportation activities.
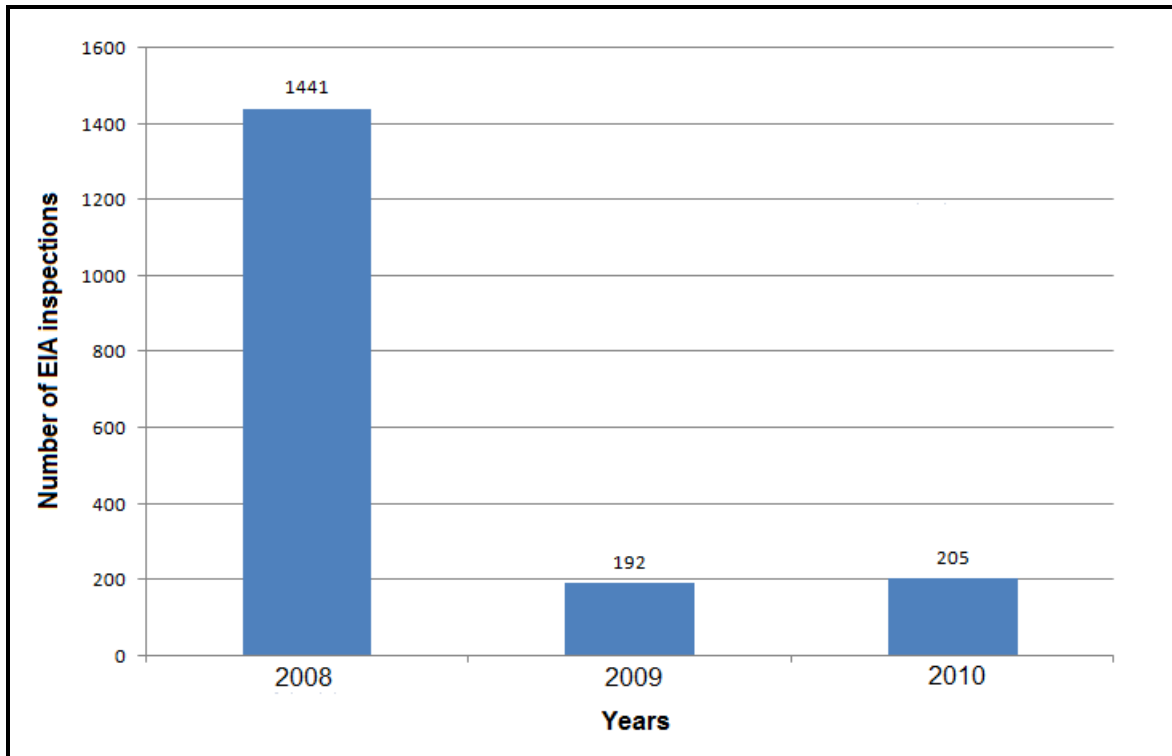
Figure 5.2: EIA inspections conducted by EMA from 2008 to 2010

Challenges Confronting EMA

Over the years, EMA has encountered several challenges/problems in the delivery of EE/ESD. These have included: lack of **an environmental ethic** due to public apathy and the **lack of alternatives** for wood fuel, timber, veldt products and other forms of wildlife (G.O.Z, 2009). According to Chandiwana (1996, 90) the country uses '*more than four million tonnes of wood as a fuel every year meeting the needs of more than seven million, mostly rural people plus a few urban dwellers. This trend has to be urgently reversed as*

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the first step and prerequisite to sustainable energy transition bearing in mind that the growth of demand for fuel wood in Zimbabwe is primarily population growth driven'. In response to this environmental crisis, the country has embarked on an ambitious rural electrification project that is aimed at reducing dependency on wood fuel (Mukute, et.al, 2012).

Other challenges include: remoteness of some areas, which prevents EMA from reaching them due to transport problems (shortage of vehicles, fuel and spares), lack of resources to build EE centres throughout the country, inaccessibility of some areas to radio, television and the internet, which are used to disseminate EE information, the prevalence of gold and diamond panning in some parts of the country leading to environmental degradation, unplanned rural resettlements and land re-distribution programmes, which damage environments as people eke out a living from dwindling natural resources, and increased cases of veldt fires, wildlife poaching and deforestation.

Information collected from the field suggests that EMA's EE campaigns are ineffective as shown by the lack of behaviour change or *action for the environment* among ordinary citizens (Fien, 1993). This is why the number of veldt fires has been on the increase in recent years as the following report shows. '*Veldt fires continued to cause havoc in the environment with 2.9% of the country having been burnt in 2012, a 21.2% increase in destruction compared to 2009. The agency increased environmental education and awareness raising campaigns on veldt fires through fire management training workshops, demonstrations and prosecution of offenders'* (EMA's Annual Report, 2010:7).

Recently, the country has also been a target of elephant poachers who used cyanide poisoning to achieve their goals as mentioned previously. According to *The Sunday Mail*, 29 September, 2013, page D6, '*nearly100 elephants have died in Hwange National Park with all indications pointing to cyanide poisoning of water holes and saltpans. Ministers have flown to the area at least twice, while responsible authorities and locals have been looking for clues on what is really transpiring. But as the teams move in, more elephants*

are dying and the toll on other animals as a result of cyanide or secondary effects after consuming carcases is yet to be quantified…Indications are that a close-knit syndicate is responsible for the killing of the elephants whose tusks are being smuggled out of the country with suggestions that they are destined for Asian and Arab countries as well as neighbouring Zambia and South Africa. The syndicates implicate some people within authorities managing the animals and border control agents who have been smuggling out ivory and even live elephants for tourism or training purposes'.

However, this situation is too complicated for an agency such as EMA, which is under-funded, and inadequately staffed (Chimhowu, et.al, 2010). According to EMA's 2010 Annual report, some 330 000 hectares of trees were being destroyed per year at national level by the large number of tobacco farmers who depend on wood fuel to cure their product. It has been estimated that if this trend of deforestation continues, '*all indigenous trees will disappear in 50 years*' (EMA's Annual Report, 2010, 12). In the same year, EMA issued 202 fines for illegal sand abstraction and ordered the rehabilitation of areas that had been damaged through granite quarrying in Mutoko. The general apathy of ordinary citizens to environmental issues can be ascribed to several factors (Mapira, 2012a). Firstly, poverty forces the poor to depend directly on natural resources (timber, wood fuel, and wild life) for their livelihood (Miller, 1994).

Secondly, inaccessibility of some places in Zimbabwe to the electronic media (radio, television and the internet) reduces the visibility of EMA to the public in these areas thereby undermining the effectiveness of its EE campaigns. Thirdly, the failure of EMA to adopt a less punitive approach in addressing issues of environmental crimes is also a problem. This is shown by its emphasis on fines, tickets and incarceration as deterrent measures instead of more community-friendly approaches such as EE campaigns. Fourthly, the lack of title deeds in communal areas encourages open access to natural resources. Finally, traditional leaders fail to effectively monitor cases of environmental crimes or damage in their areas of jurisdiction due to resource constraints.

Suggested Solutions

In response to interviews (Annexure 1), EMA officials suggested several solutions for the above problems. For example, at national level poverty should be addressed as a major cause of environmental problems. This is in keeping with observations which have been made elsewhere in Africa. For example, according to Otiende (1997), although EE in Kenya dates back to the mid-1970s, most people still lack a sense of environmental stewardship due to their pre-occupation with survival issues. This general lack of interest in environmental protection issues has been detrimental to EE programmes especially at the grass roots level. Coupled with the lack of political will at national level, environmental problems have received little or no attention from policy makers.

A study which was conducted in a resettlement area has shown that poverty undermines the successful implementation of EE projects in Zimbabwe (Shumba, Kasembe, Mukundu and Muzenda (2008). Rural communities should be provided with alternative sources of energy and food so that they do not have to depend on wood fuel, timber and other veldt products for survival. Solar energy kits can be donated to them since most villagers can not afford them. Irrigation schemes can also be introduced in order to enable them to produce their own food. Without self-reliance on food production, villagers are not likely to refrain from plundering natural resources around them as the study has already shown (Otiende, 1997).

There is also a need to provide more funding to EMA so as to consolidate its capacity in the delivery of EE to the public. For this to happen, the Zimbabwean government would have to mend its relations with Western donor countries. Since 2000, the country has been experiencing isolation due to its hostilities with some of them over human rights violations in both land invasions campaigns and the conduct of elections (Bond and Manyanya, 2003). EE centres should also be established as soon as possible throughout the country so as to speed up the dissemination of information on environmental issues. This calls for more funding especially from government and the private sector.

Respondents also suggested the designing of programmes aimed at educating members of the public so that they take environmental issues more seriously. However, this calls for a long term perspective since attitudes take much time to change. The Zimbabwe Government has been known to flout its own rules and regulations in the past. For example, the *Fast Track Land Reform Programme* was never preceded by an Environmental Impact Assessment (EIA) even though EIAs are mandatory according to the country's environmental policy (G.o.Z, 2009). There is a need for an improvement in this regard if SD has to be achieved. More emphasis should also be put on EE instead of using punitive measures such as fines and litigation in order to address environmental crimes. EMA should be more visible at the grass roots level. To date, due to under-funding, the agency is failing to reach many remote parts of the country.

Furthermore, there is a need to disseminate EE information (brochures, pamphlets, posters and other forms of literature) to remote areas. Rural electrification should be intensified so as to promote the spread of the electronic media (radio, television and the internet) as well as reducing rural communities' dependency on wood fuel, which encourage deforestation (Chandiwana, 1996). Encouraging rural people to develop a sense of environmental stewardship through projects that safeguard the environment such as gulley control, water harvesting, dam construction and tree planting was also suggested. Finally, using indigenous knowledge systems (IKS) more intensively in the provision of and dissemination of EE information especially in rural areas were also proposed.

Recent studies have exposed the value of IKS in environmental management. Mapira and Mazambara (2013: 90) for example, argue that '*although it is not possible for the country* (Zimbabwe) *to revert to the pre-colonial past, policy makers can draw some lessons from and incorporate them* (IKS) *in their quest for sustainable development*'. The training and involvement of traditional leaders such as chiefs and headmen is also a noble intention by policy makers (Mapira, 2012a). However, it is doubtful whether EMA has the capacity to execute this mandate given its weak financial position, under-staffing and inadequate resources. Unless the government addresses these problems, the

environmental management agency is not likely to improve its performance in the pursuit of its EE and SD goals at national level.

5.3: The Forestry Commission (FC) and its Role in the Delivery of EE

The Forestry Commission is a statutory body under the Ministry of Environment and Natural Resources Management (*FC Information Brochure*, page 1). Its mandate is derived from the Forest Act (Chapter 19:05) of 1999 and the Communal Forest Produce Act (Chapter 20) of 1987. The two Acts provide regulations for: the Forest Sector, Forestry Extension, Management of Gazetted Forests, Forestry Research and Training, and Income Generation. The main goal of the FC, according to its Information Brochure of 2012 (page 2) is to '*promote the sustainable management and development of the nation's socio-economic development through effective regulation and capacity enhancement in the sustainable utilisation and management of forest resources*'.

At national level, the FC seeks to achieve three main objectives, namely: facilitating the improved supply and management of tree and forest resources at provincial and district levels, promoting the sustainable and economic use of tree and forest products in communal and resettlement areas, and providing EE to rural communities with a special focus on forestry issues. According to information that was derived from interviews (Annexure 1), the Masvingo branch of the FC defines EE as the creation of public awareness on the value of the environment including forests. It also views SD as a form of '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*'. It goes on to define ESD as '*awareness raising that improves the quality of human life while living within the carrying capacity of supporting ecosystems*'.

The activities of the FC at provincial level include: facilitating tree seedling production and tree planting, conducting farmer training work shops in forestry issues, production and distribution of information brochures, conducting awareness campaigns and commemorations on events such as the World Forestry Day and the National Tree Planting Day (NTPD), and enforcing the forest legislation in conjunction with the police

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and traditional leaders. The Commission comprises three divisions, namely: Conservation and Extension, Forest Research and Training, and a Safari Business Trading Department known as Ngamo Safaris. Although EE/ESD is not its core business, the FC collaborates with EMA to provide it. This is accomplished in several ways including: conducting environmental awareness campaigns at provincial and district levels, educating the public about the dangers of veldt fires, teaching people about the importance of tree planting, disseminating information on the value of indigenous trees, and training communities on how to grow trees such as gum trees and fruit trees, which have a socio-economic value.

The Conservation and Extension Division is responsible for the management of gazetted forests in the country (Matebeleland and Midlands Provinces).It has offices in all provinces and districts. Its main aim is to *'facilitate the improved supply and management of tree and forest resources throughout the country with emphasis on communal and resettlement areas' (*FC Information Brochure, page 3*).*This is achieved by equipping communities with knowledge and practical skills on tree planting and management. The division has four goals, which guide its operations. Firstly, it seeks to reduce environmental degradation through seedling production and tree planting and World Forestry Day campaigns, concession supervision, development of woodland management plans, carrying out farm/area inspections, conducting anti-poaching patrols, organising publicity articles and conducting exhibitions, field days and training workshops.

Secondly, it strives to increase compliance with Forest Regulations through: organising workshops for staff and stakeholders publishing new regulations through the mass media, carrying out inspections to ensure compliance, issuing out forest produce movement permits, and accreditation of export companies. Thirdly, it seeks to increase Forestry contribution to the Gross Domestic Product (GDP) through: increased random checks at border posts, putting in place revenue collection systems, developing guidelines and proposals for main sources, supporting forest-based enterprises, and putting in place loss control measures. The fourth goal is directed at improved accountancy records of forest resources through: mapping of forest resources at district level, carrying out timber

inventories in gazetted forests from destruction by fires, developing and maintaining game water supplies, conducting game counts, reviewing forest management plans for gazetted forests. In addition to the above tasks, the division has developed nurseries throughout the country in order to provide seedlings for a-forestation programmes. The nurseries supply both exotic and indigenous species as well as information on how to take care of the trees.

The Research and Training Division conducts research and forestry training for the national forestry sector. It is geared towards the development and management of forest resources. Its products include: research publications, improved seeds, information on the growth patterns of trees, their ecological requirements and skilled forestry personnel. The resultant knowledge, technology and expertise promote the sustainable management and utilisation of forest resources. The division comprises two wings, namely: Research, and Training. The research wing is further divided into two units, namely: Plantation Forestry and Social and Indigenous Forestry sectors. The two units are backed by the Technical Services Unit. The headquarters of the research unit is in Harare (Forest Research Centre). It also runs subsidiary branches near Stapleford in Chimanimani and Bulawayo as well as smaller research sites scattered throughout the country.

The training wing runs two colleges, namely: the Zimbabwe College of Forestry (ZCF), and the Forest Industries Training Centre (FITC).While the ZCF provides training in the management of forest resources, FITC offers training in primary wood processing. The two colleges offer certificate and diploma courses in addition to short courses for those already employed in industries. The colleges provide training opportunities at national level as well as the SADC region as a whole. From 1940 to 1979 (colonial era), they produced only 134 graduates compared to 868 after independence (1980-2012).

The division's mandate includes: conducting cost effective and client ordered research for the entire forestry sector in Zimbabwe, publish research results and develop technology for managing natural and plantation forests, and producing skilled labour for the national and SADC forestry sector through training at diploma and certificate levels

as well as client oriented short in-service training. Research plays a key role in the country's forestry resources and their associated industries. It provides solutions for social, commercial and environmental problems at national, regional and global levels. Some of the major research programmes include: tree breeding, seed physiology, plantation and indigenous silviculture, entomology, biometrics, and mapping and inventory services.

Ngamo Safaris was established in order to generate income for conservation programmes in the country's indigenous forest areas. This is done through recreational activities such as hunting and photographic safaris. Situated in the north western part of Zimbabwe, the facilities provide an opportunity of viewing flora and fauna in addition to hunting in a natural wilderness, which is rich in plant, animal and bird species. Due to its popularity at regional and global levels, Ngamo Safaris has become a major source of revenue for the FC (FC Information Brochure). Achievements made in the past include: planting a total of .15 million trees at national level between 2011 and 2012, including the national tree planting day on the national calendar since 1981, encouraging individuals to establish commercial tree nurseries, developing small and medium enterprises (SMES) from timber utilisation, and publicising information on indigenous trees, the Tree of the Year concept (G.o.Z, 2009).

However, in spite of these achievements, the FC has encountered some challenges, namely: under-staffing with only one officer per district, which undermines its operational capacity, and frequent electric power cuts, which force people to resort to wood fuel for energy. This encourages indiscriminate tree cutting in some areas. Possible solutions for these problems include: the promotion of alternative sources of energy such as solar, more resources should be channelled towards EE if positive results are to be realised, and continued networking with other organisations, which provide EE. A major strength of the FC is its ability to generate income through Ngamo Safaris. Unlike EMA, it is financially self-reliant, which is necessary for sustainable development. However, the under-staffing of the organization also reflects the lack of political will among policy makers (Lopes, 1996).

5.4: AGRITEX as a Provider of EE in Zimbabwe

The Department of Agricultural, Technical, and Extension Services (AGRITEX) also plays an important role in the provision of EE/ESD at national, provincial, district, ward and village levels. Falling under the Ministry of Agriculture, Mechanisation and Irrigation, it is guided by several objectives, including: training of farmers and providing advice and extension services, disseminating agricultural and market related information, mobilising farmers for targeted production, monitoring crops and livestock production trends at national, provincial and district levels, disseminating and promoting the adoption of new technologies through on-farm trial and demonstrations, field days and exchange visits, providing regular reports to the Ministry of Agriculture, Mechanisation and Irrigation and other stakeholders, and educating farmers and communities on how to care for their land, soil, water and other natural resources (that is, EE/ESD).

Its main activities include: the provision of agricultural extension services, training of farmers and staff, developing and disseminating technical papers or fact sheets, coordinating agricultural programmes, enhancing capacity building among farmers, and providing EE/ESD to the farming communities. From 2000 to 2011, for example, 6 689 master farmers were trained in the seven districts of Masvingo Province (Table 5.3). Apart from skills on crop farming, soil management and animal husbandry, these farmers also received EE/ESD information in the form of conservation education. Other achievements that have been recorded over the years include: increased number of extension staff to 4 per ward compared to only one during the colonial era, production of technical papers, at least 18 at provincial level per year, and holding of agricultural shows, field days and seed fairs at district and provincial levels.

Table 5.3: Numbers of master farmers trained in Masvingo Province from 2000 to 2011

Year	No. of Master Trained
2000	303
2001	250
2002	315
2003	158
2004	433
2005	1015
2006	1086
2007	1015
2008	760
2009	190
2010	404
2011	760
Total	**6 689**

Source: AGRITEX: Masvingo Province

However, in spite of these achievements, AGRITEX has experienced several challenges, including: lack of transport for extension officers, shortage of resources such as computers at both district and provincial levels, lack of accommodation for extension workers especially in resettlement areas, poor remuneration for staff, sub-standard communication systems at all levels, and lack of effective mechanisms to enforce legislation on resource conservation. Most of these problems are due to the under-funding of AGRITEX, which undermines its operations at national, provincial, district and ward levels. There is a need for more funds to improve the working conditions of staff at all levels. However, this problem applies to the rest of the civil service due to the near collapse of the national economy in recent years (Chimhowu, et.al, 2010).

5.5: The National Parks and Wildlife and Its Role in the Delivery of EE

The Parks and Wildlife Management Authority (PWMA) dates back to the colonial era and its objectives include: wildlife conservation, environmental protection, protection and management of wildlife, and administration of wildlife in Zimbabwe. Targeting communities, which are involved in national parks management and their stakeholders, its main activities include: conducting research on wildlife and environmental issues, generating technical information in order to support wildlife management, conducting EIAs, assisting planning on wildlife development projects, and providing technical and scientific advice to wildlife stakeholders. These activities are conducted at both national and provincial levels. For example, in 2012 the Masvingo Provincial Branch made three significant achievements including: conducting research in more than five wildlife areas, carrying out more than twenty EIAs, and assisting more than twenty wildlife stakeholders on development projects (Field Data).

However, in spite of these achievements, the department experiences several challenges, such as: inadequate funds for operations, research and outreach programmes, shortage of vehicles for transport, and policy makers who do not prioritise EE/ESD, lack of publicity on EE/ESD issues, and general lack of cooperation between stakeholders on EE/ESD. This is mainly due to the under-staffing of EMA, the coordinating agent of EE/ESD. Solutions suggested for these challenges include: the need to form EE/ESD partnerships among stakeholders, soliciting for funds from donors, and the need for government to prioritise EE/ESD issues through adequate funding. The PWMA is affiliated to colleges, which train some of its manpower. For example, the Mushandike College of Wildlife Management in Masvingo Province trains parks and wildlife employees and provides capacity building to all stakeholders. Other activities include: training students and employees on wildlife management, carrying out researches on wildlife, and conducting EIAs (Field Data).

In 2012, the college made three major achievements, including: producing more than 300 graduates, conducting more than 200 researches, and carrying out more than five EIAs. However, over the years, the college has faced some challenges such as: inadequate funds for researches, little support from policy makers especially on EE/ESD issues. Suggested solutions for these problems include: seeking for external/foreign donors, encouraging cooperation between EE/ESD stakeholders, and increasing EE/ESD publicity especially at grass roots levels (Field Data).

5.6: Urban Councils and the Provision of EE

Apart from their numerous activities, urban councils also deliver EE in their areas of jurisdiction. This is done by their environmental health departments, which usually work in partnership with EMA even though EE is not their core business. For example, the city of Masvingo regularly conducts EE campaigns in partnership with EMA. Some of the issues addressed include: waste disposal and management, air, land and water pollution control, water, hygiene and sanitation, and health education. In response to interview questions (Annexure 1), the city council officials listed several achievements, which they recorded in 2012, including: developing a cleaner city, which is healthier and environmentally friendly, establishing community health clubs, which clean their environment, successfully hosting the 2011 National Sanitation Week, conducting anti-littering campaigns in partnership with EMA, and purchasing two new refuse collection and compactor vehicles for effective solid waste disposal.

However, in its regular operations, the city's environmental health department has encountered several challenges including: increasing population growth within the city has led to an increase in quantities of litter disposed indiscriminately, the city's dump site is now full and overdue for de-commissioning but the lack of funds and an alternative site forces the council to continue to use it beyond its life span, the development of new housing close to the dump site compromises people's health as flies and mosquitoes migrate to places of human habitation, and a new waste disposal site requires huge capital to develop it to EMA's standards. At the moment funds are not available for such a big project (Mapira, 2012b). While the above challenges tarnish the department's image in

the public view, its failure to set a good example, obviously under-mines the effectiveness of its EE campaigns, at city level as people cannot take it seriously.

5.7: The Role of NGOs in the delivery of EE

Although it is not their core business, NGOs play a significant role in educating ordinary citizens on how to take care of their environment. Working in collaboration with EMA, they provide EE to various communities throughout the country. This study examined the operations of three NGOs, namely: Care International, Caritas (Masvingo) and Christian Care.

Care International is a donor organisation, which operates in three provinces of the country, namely: Masvingo, Matebeleland South and Midlands. It has four main goals, including: poverty reduction, empowering (rural) communities so that they can be self-reliant, addressing discrimination in all its forms, and creating economic opportunities for disadvantaged communities. Over the years, the organisation has been involved in several activities such as: conservation agriculture, establishing community gardens in rural areas, dam rehabilitation and catchments protection, gulley rehabilitation, re-a forestation, farmer training, agro-forestry, and strengthening community management structures.

Some of the achievements, which it has made in the past include: training of some 36 734 farmers on conservation agriculture, 2 900 people have been trained on by-law formulation and enforcement, a total of 16 941 villagers have been trained on environmental management techniques including EE, 2 900 were also trained on gulley control measures and catchment area protection, and some 16 941 people have also received training on sustainable harvesting and marketing on non-timber forest products. However, in trying to execute its mandate, the NGO has encountered several challenges. Firstly, some politicians from the ruling party-Zimbabwe African National Union-Patriotic Front (ZANU-PF) occasionally interfere with the operations of NGOs, which they regard with suspicion. At the grass roots level, there is a lack of supportive structures for NGOs in general (Field Data).

Secondly, the NGO is under-funded, which weakens its effectiveness in executing its mandate. The shortage of publicity materials (brochures, posters and other forms of literature), and chronic droughts, which lead to food and water shortages thereby increasing the number of people in need of aid, are other challenges. Officials of the NGO suggested several solutions for the above problems, including: publicity of EE/ESD issues on television and radio with a view to educating the public, improvement of the hostile political environment in which politicians can be more supportive so as to encourage the NGO in its operations, addressing climate change vulnerability at national level so that adaptation strategies can be developed, and improved funding of the NGO so as to make it more effective in its operations.

Caritas Masvingo is a donor NGO, which is run by the Catholic Church in Zimbabwe. It has been in existence for more than a decade and it targets rural and peri-urban communities in Masvingo Province. Caritas seeks to achieve the following objectives, namely to: alleviate hunger among vulnerable households, mitigate the impact of health dangers, reduce the negative impacts of disasters and emergencies, promote food security through production, and empower communities economically and socially so that they can respond to any risks. Its main activities include: conservation and sustainable agriculture, environmental protection, addressing climate change issues, and providing micro-finance to vulnerable communities. In recent years, Caritas has made several achievements including: establishing demonstration plots for research and fields that increased yields, training communities in environmental management issues, conservation, harvesting and tree planting in schools, educating communities on seed multiplication and preservation, training people on disaster risk reduction, and educating communities on natural methods of farming, which are environmentally friendly.

Caritas has encountered several challenges, which hamper the execution of its mandate. Food insecurity hampers the projects aimed at achieving sustainable development. Chronic droughts lead to the death of planted trees and crop seedlings while veldt fires destroy nature. Funding aimed at supporting EE/ESD campaigns is limited while

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literature for educating targeted communities on environmental issues is scarce. EE/ESD campaigns are still in their infant stages in the province and at national level as EMA lacks strong linkages with civic organisations such as NGOs. Government support for EE/ESD programmes is also limited due to in-sufficient budgets while follow-up on research recommendations is not very effective among civic organisations due to their lack of exposure to them.

The organisation proposes several possible solutions to the above problems, including: developing micro and macro irrigation schemes for the benefit of vulnerable communities, enhancing training on environmental issues, educating people on climate change adaptation, developing EE/ESD using indigenous languages such as Shona and Ndebele, promoting the rearing of small livestock such as goats and sheep with a view to boosting nutrition at grass roots level, and establishing EE/ESD clubs as a strategy of disseminating information on environmental protection.

Christian Care is a Christian based donor organisation, which operates throughout Zimbabwe. It seeks to enhance food security among vulnerable communities by training them on conservation farming. It has been operating in the country since the early days of independence. It targets rural areas, which are recipients of food aid and conservation farming training. In Gutu District (Masvingo Province), some 1 500 farmers have been trained and can harvest enough food even during drought years. However, the organisation has encountered two main challenges, namely: resistance to change by some communal farmers, and lack of funds to hire experts who can train farmers on EE/ESD.

Resistance to change is quite common among subsistence farmers who are used to some traditional farming practices, which are based on IKS that have stood the test of time (Mapira, 2013). Experimenting with new approaches is often regarded with suspicion and most peasant farmers would rather avoid it in favour of tried and tested methods of farming which date back to the pre-colonial era. Lack of funds is also a common problem given the fact that Zimbabwe's economy has not been performing well in recent years (Mapira, 2012b). Suggested solutions for these problems include: providing more funds

for hiring experts who can deliver EE/ESD in targeted areas, using stiffer penalties on people who transgress environmental by-laws, and making EMA more visible at ward and village levels. However, the use of punitive measures in order to solve problems has been shown to be counterproductive, hence some researchers recommend the use of education instead of force (Lopes, 1996).

5.8 The Role of the Media in the Delivery of EE

The media is one of the key providers of EE in Zimbabwe. As an agent of socialisation, it has the potential to influence people's views, attitudes, opinions and behaviour (Giddens, 1997). It seeks to achieve several goals, according to information derived from interviews that were conducted in the field: educate, inform and entertain the public, collect news and disseminate it to the nation, promote development at local and national levels, provide advocacy on issues of local and national interest, and generate income through advertisements. In the provision of EE, Zimbabwe's media is guided by nine objectives, which are outlined in the national policy document (GoZ, 2003). Firstly, it seeks to integrate EE in teaching, learning, training and extension programmes in the formal and informal sectors of education. The strategy involves the incorporation of EE in media studies. Three actions are involved, namely: the provision of pre-service and in-service EE courses for media personnel, up-dating the media on key environmental issues/events thereby enabling them to report accurately and disseminate environmental news and emphasize the need for adequate research prior to reporting on environmental issues.

Secondly, it is geared at raising public awareness of environmental issues, and promoting a holistic management of the environment in all sectors of the community. The strategy is to sensitize the public on environmental issues and SD goals in the country. The actions involved include: encouraging environmental reporting by media personnel, utilizing a variety of media channels to disseminate environmental information to the public, and involving the media in environmental activities and deliberations. Thirdly, it facilitates the development of knowledge, skills, attitudes and values requisite for environmentally sustainable behaviour. The strategy is to promote an environmental ethic by popularizing environmentally friendly behaviour and actions. The main actions include: the use of

various genres in mass media productions focusing on environmentally sustainable behaviour and produce inter-active media products, which promote environmentally friendly behaviour.

Fourthly, it is intended to promote SD through the use of all channels of communication. The strategy is to document and report SD activities at community and national levels. Actions involved are: using a variety of mass media to document and report SD practices, making SD a key feature of media communication channels and highlighting global best practices on SD, which are applicable at the local level. Furthermore, it seeks to: encourage sustainable livelihoods within communities not usually reached by formal channels of education, and communication. The strategy involves encouraging a participatory approach in the planning and implementation of environmentally sustainable projects by local communities. Actions on the other hand include: providing media and arts outreach programmes to outlying communities, documenting and reporting environmentally sustainable local community activities and initiatives, and drawing government attention to environmental challenges in marginalized communities.

In addition, it seeks to identify and mobilize resources to initiate self-sustaining EE activities. The strategy is to support self-sustainable EE initiatives. Actions include: reporting self-sustaining initiatives by stakeholders and train communities to produce media materials on EE activities. It is also geared at protecting and promoting the use of indigenous knowledge systems (IKS). Strategies are: to develop community awareness of the value of IKS and to encourage the preservation of IKS. Actions include: providing media coverage of IK practices in English and indigenous languages and promoting and encouraging attitude change through documenting practical applications of IKS.

It seeks to support private and public initiatives in EE research. The strategy is geared at making environmental research findings topical media issues while the action involves documenting and reporting public and private EE research initiatives and findings. Finally, it seeks to ensure the monitoring and evaluation of EE programmes and activities in all sectors. The strategy is to follow up the progress of EE programmes and activities.

This is supported by two actions, namely: producing media reports (documentaries and features) covering the implementation of environmental programmes and activities, and disseminating information on EE initiatives inside and outside the country.

There are two broad types of media in the country, namely print (news papers, magazines, brochures and posters) and electronic (radio, television and the internet). It is pertinent to examine the contribution of each media type in the provision of EE. Zimbabwe's print media comprises three types or categories, namely: government-controlled news papers run by either ZIMPAPERS or ZIANA, privately owned and run news papers, and brochures, posters and pamphlets produced by government departments such as: EMA, FC and AGRITEX (Mapira, 2013).

ZIMPAPERS publications include weekly papers such as: The *Sunday Mail* and *The Sunday News,* and daily papers like *The Herald* and *The Chronicle,* which all have a national coverage. There are also local papers, which are government-controlled such as: *The Manica Post* (Manicaland), *Gweru Times* (Midlands) and *The Masvingo Star* (Masvingo). While government controlled papers are sympathetic to the ruling party, private ones provide an alternative view point. Privately owned news papers include weekly publications such as: T*he Standard, The Financial Gazette* and daily papers like *Daily News, News Day* and *The Mirror*. The aim of brochures, posters and pamphlets is to educate the public on some issues of special interest, such as: the environment, forestry and agriculture.

An examination of some of the recent publications by government controlled (Table 5.4) and privately owned news papers (Table 5.5), shows the role of the print media in the dissemination of EE in Zimbabwe. Themes covered in the first table include: river/water pollution, dam construction, rains, storm and floods, which educate the public on environmental issues. The privately owned print media also pursue similar themes including: wildlife, disease outbreaks, waste disposal and management, poaching of endangered animals, cleaning the environment and bio-diversity in the Gonarezhou National Park, river pollution, Miss Earth beauty pageant and water pollution.

Table 5.4: Environmental issues published recently in government-controlled News papers

Name of Paper	Story	Environmental Issue Covered
The Sunday Mail, November 11-17, 2012 page D7	'Residents drink own waste…as tests prove water safe for human consumption'	Pollution of Lake Chivero, Harare's main water source.
The Sunday Mail, December 23-29, 2012 page D3	'Tokwe-Mukorsi: Chivi's lifeline'	Dam construction in a semi-arid area.
The Sunday Mail, December 30, 2012-5 January, 2013, page 3	'Storm destroys 32 homes in Chivi'	Damage caused by a rain storm in Chivi area.
The Masvingo Star, January 28-February 3, 2013, pages 1-2	'Masvingo dams gain'	Increase of water level in Lake Mutirikwi, Masvingo's only source of water.
The Sunday Mail, January 27-2 February, 2013	'33% of Harare bore holes contaminated'	Underground water pollution in the City of Harare.
The Sunday Mail, February 3-9, 2013, page D3	'Floods: The nightmare continues'	Damage caused by floods in the Zambezi Valley.

Source: Government-controlled newspapers

Some government departments such as EMA and FC produce information brochures, posters and pamphlets, which they distribute to members of the public during global and national events such as: the World Wetland Day (February), Africa Environment Day (March), National Fire Week (May), World Environment Day (June) and the Tree Planting Day (December). These events are included in EMA's calendar (Mapira,

2012a). Examples of brochures produced by EMA include: '*Introducing EMA*', which provides information about the agency, '*Environmental Impact Assessment (EIA)* in Zimbabwe, which educates the public on EIAs and justifies their operations in the country, '*Air Pollution*', which provides information on the problem of atmospheric pollution, its causes, effects and penalties that are meted out to offenders, '*Resource Handbook for Traditional Leaders*', a training manual for traditional leaders, '*Training Manual for Environment Communities*' and '*World Wetlands Day 2013*', which provides information on this global annual event.

It can be noted that Zimbabwe's media plays a key role in the dissemination of EE information. It is a powerful agent of socialisation and has the potential to inculcate positive attitudes toward the environment. According to the country's EE policy document (G.o.Z, 2003:3), its major goal is to make '*sustainable development a national priority, to take a proactive role in environmental issues and respond to environmental challenges facing Zimbabwe at the personal, local, national, regional, and global levels through education and communication processes*'. However, its current polarisation causes confusion among less critical citizens.

According to Mapira (2013, 13), some politicians discourage journalists '*from reporting on some environmental issues, which they believe can tarnish the image of their political party…Such political attitudes under-mine press freedom and EE as they seek to promote narrow, partisan interests at the expense of SD at local and national levels*'. In some countries, politicians avoid interfering with the media as that is a violation of human rights such as the freedom of expression. However, in Zimbabwe, the problem has been going on for decades (Bond and Manyanya, 2003). For example, Moyo's (1997) report on the pollution of Lake Chivero received much criticism from some top government officials who viewed the book as a form of negative publicity.

Another weakness of the country's print media is its marginalisation of indigenous languages such as Shona, Ndebele and the minority languages including: Kalanga, Sotho,

Venda and Shangani. Since the bulk of the population are not proficient in the English language, this undermines EE and environmental awareness in general.

Table 5.5: Environmental issues covered by the private print media

Name of Paper and Date of Publication	Story Title	Environmental Issue Discussed
The Mirror,21-27 September, 2012, page 3	'Masvingo council guilty of polluting rivers'	River pollution in urban centres of Zimbabwe
The Mirror, 9-15, November, 2012, page 16	'Morgenster student scoops EMA beauty contest'	Miss Earth beauty pageant
The Mirror, 9-15 November, 2012, page 17	'Gonarezhou National Park: A jewel in the crown'	Biodiversity in the Gonarezhou Park.
The Daily News, Saturday, 29 December, 2012 page 13	'The Secret Lives of Africa's Giant'	Rhinos and Elephants: Newly discovered habits'.
The Daily News, 3 January, 2013, page 11	'Repair sewer pipes. No water, more garbage'	Problems of waste management in Harare
News Day, Friday, January 11, 2013, page 12	'Zambia bans hunting of lions'	Wildlife poaching
News Day, Monday, January, 28 2013 page 4	'Clean up Zimbabwe Campaign'	Cleaning the environment
News Day, Friday, 4 January, 2013 page 5	'New cholera outbreak hits Zambia'	Disease outbreak due to sanitation problems
News Day, Thursday, 7 February, 2013, page 21	'CLEAN UP ZIMBABWE CAMPAIGN'	Anti-littering campaign
The Mirror, 8-14, February, 2013	'Brown water oozes out of Masvingo taps'	Water Pollution
The Standard, 10-16 February, 2013, pages 1-2	'City residents turn to bucket latrines'	Waste disposal problems in Mbare (Harare)

Source: Recent Newspaper Publications

The FC also produces and disseminates several brochures and pamphlets, with the goal of educating the public on forest conservation issues. For example '*The Forest Commission*', outlines the vision, mission, core values, goals and operations of the organisation at local and national levels. The '*World Forestry Day*' provides information on this global event that is observed on the 21st of March every year while the '*National Tree Planting Day*' deals with the tree planting day, an event that is commemorated on the first Saturday of December every year. The '*Tree of the year*' provides information on a tree that is chosen for this purpose during a particular year. For example the tree of the year 2012 was *Khaya anthotheca* (Red mahogany or *mururu* in English and Shona, respectively). Finally, the '*Gum Tree Planting Calendar'* guides the public on the various stages that are followed in planting and caring for the gum tree.

Challenges confronting the media

In general, the main challenges confronting the media in the dissemination of EE/ESD in Zimbabwe include: the remoteness of some areas, which hinders the smooth dissemination of both electronic and printed information, the predominance of English over indigenous languages in the provision of EE/ESD, the lack of EE centres, resistance from communities, which do not take environmental issues seriously, and lack of skilled reporters who can write effectively on environmental issues. This applies to local news papers such as: *Gweru Times, The Masvingo Star* and *The Manica Post*. Inadequate resources such as vehicles to transport reporters to some remote areas so as to collect information for publication are also a challenge as well as interference from some politicians who want to influence the type of news delivered to the public (Mapira, 2013).

Such individuals discourage reporters from covering some environmental issues, which they fear may tarnish the image of the country at local, national and global levels. Finally, government hostility to the privately owned media, which it regards with suspicion, is another challenge. In some cases, news papers have been confiscated from street vendors and destroyed by suspected supporters of the ruling party (Bond and Manyanya, 2003). In such cases, the police have often turned a blind eye thereby displaying their partisan interests. Without a conducive, political environment, the media is not likely to succeed

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in its goal of educating the public on environmental problems that are confronting the country.

5.9 The Role of Arts and Culture in the Provision of EE

The National Arts Council of Zimbabwe is one of the providers of EE/ESD in the country. Its main objectives, according to data collected from the field, include: developing and promoting arts and culture at national and local levels, coordinating and supporting arts and culture activities, facilitating the registration of arts practitioners, assisting in the export of cultural artefacts, providing entertainment and national development, and Educating the public through activities such as: drama, dance and song. Some of the activities, which it has been involved in over the years, are the: exhibition of artefacts made of natural resources, production of pottery, baskets, mats and sculpture, holding of festivals where artists showcase their crafts, marketing products of artists during cultural fairs, and registering arts and culture consumers.

The organisation has made several achievements, including: recruiting sponsors for different artists, developing provincial and district arts data bases, coordinating annual festivals, holding awareness campaigns aimed at providing EE/ESD to the public, and cooperating with EMA on how to enable communities to conserve natural resources. The National Arts Council is funded by a trust (the Culture Fund of Zimbabwe Trust). It provides funding to the following organisations: individual cultural agents operating independently or as registered companies and artists who work in groups, cultural organisations, and cultural institutions. According to the culture fund website (www.culturefund.org.zw), grants ranging from US$3 500.00 to $20 000.00 can be awarded per year to eligible applicants.

The main challenges, which artists face include: lack of vehicles for transport at district and provincial levels, shortage of staff as only two people run the provincial offices, lack of allowances from EMA and the FC, and failure to reach artists in remote parts of the country due to resource constraints. Solutions suggested by officials of the Arts Council included: the need of vehicles to transport officers in their daily duties, provision of

adequate staff at provincial and district levels, offering incentives to the staff in the form of allowances during EE/ESD campaigns, and linking up with artists in remote areas.

5.10. EE among ordinary citizens or members of the public

In order to determine the progress of informal and non-formal organizations in the dissemination of EE/ESD, an interview (Annexure 2) was administered in Zimbabwe's ten provinces. Some 200 respondents were targeted, drawing 20 from each of the provinces while maintaining gender equity. Consequently, 100 males and an equivalent number of females were interviewed in each province. The respondents ranged from below the age of 18 to above 66. Some 170 had received EE while 30 who came from Manicaland, Masvingo and Matebeleland South, had not. Question 10 asked respondents whether they had benefited from the EE, which they had received. Some 160 agreed while 40 disagreed. Those who agreed gave a number of reasons/benefits: Firstly, it taught them how to minimize land degradation, air and water pollution as well as conserving grass, trees and soil. Secondly, it gave them information on the sustainable use of natural resources and inculcated positive attitudes towards the environment.

Thirdly, it educates them on how to prevent and control veldt fires and to conserve forests and wildlife. Fourthly, it gives them knowledge on matching available resources with demand for future use. It also educates them on water harvesting and conservation while informing them about the value of some trees and plants especially in the production of natural herbs which are cheaper than modern drugs. Furthermore, it educates them on how to avoid deforestation, soil erosion and river siltation as well as informing them about the value of a forestation schemes such as gum trees, which supply timber for domestic consumption and export.

It has taught them to keep the environment clean thereby promoting good health at the community level and educated them on the value of bio-diversity in ecosystems. Other benefits include teaching them about the dangers of chemical pollution, poaching of wildlife and the destruction of forests. It has educated them on how ecosystems function and given them knowledge on causes, effects and mitigatory measures of climate change.

Finally, it has educated them on the importance of EMA in resource conservation and management and taught them about the causes, effects and control measures of Ozone Layer Depletion. An examination of the above responses shows that most of them erroneously equate EE/ESD with (either environmental science or) environmental management, just as Ketlhoilwe (2007) in a study of Botswana has shown.

Aspects of behaviour change, attitudes, lifestyles and the sacrifice of materialistic goals for the protection of the environment are generally lacking in these responses (Fien, 1993 and Palmer, 1998). This confirms the belief that most Zimbabwean citizens lack in-depth knowledge of EE/ESD, an issue which should be addressed as a matter of urgency if the country has to achieve its intended goals (Shumba, et.al, , 2008). Chikunda (2007, 168), advocating for a change in EE/ESD approaches in Zimbabwe, argues that '*improvement of basic education and re-orienting existing education should aim at developing knowledge and skills for citizens to jointly identify their problems and act on them in a sustainable manner*'. This study makes the same recommendation.

Respondents who disagreed gave three reasons. Firstly, most EE campaigns target people who are not employed thereby excluding those who are at work. Secondly, EMA and some NGOs lack visibility at the grass roots level hence most remote areas have not been reached due to transport costs involved. Finally, providers of EE such as EMA and some NGOs are constrained by limited funding. Hence their impact at the local level is hardly felt. From this study, problems which undermine EE programmes in Zimbabwe were identified. They include the lack of government commitment (Nkala, 1996) as shown by the under-staffing and under-funding of EMA at national, provincial and district levels. The lack of EE centres, public apathy towards environmental issues, and the failure of the public to understand environmental laws and regulations that are in place, are additional challenges (Mapira, 2012a).

The lack of continuity of some of the EE programmes especially those initiated by some NGOs who eventually abandon them when funds run out, was also cited as a problem. Some resources are difficult to conserve such as trees in un-electrified rural areas or gold

panning along some rivers. Communities which are poor, have no alternative sources of livelihood (Shumba, et.al, 2008). The lack of text books on EE in schools and public libraries is another hurdle, while some people are resistant to changes proposed by EE experts. Hence they continue with their environmentally un-friendly habits (such as cutting down trees for timber and wood fuel, cultivating down slopes and failure to build toilets).

Poverty, which pushes people into activities that degrade rather than conserve the environment combined with the lack of environmental ethics at the personal level in both urban and rural areas, also presents a challenge as it discourages people from taking positive action for the environment. The criminalization of livelihood activities such as hunting at the expense of education was also identified as a problem (Lopes, 1996). Traditional leaders who are the custodians of environmental by-laws lay too much emphasis on meting out penalties and demanding fines at the expense of educating the culprits (Lops, 1996). This encourages corruption in the form of bribes thereby undermining EE/ESD in their communities (Mapira, 2012a).

Several solutions were suggested for these problems. Firstly, change of behaviour and attitudes should begin from the top (*Central Government*) cascading downwards (communities) rather than vice versa. Secondly, EE should be introduced in schools in order to popularize it. Thirdly, EE policies should not just appear on paper but should be implemented through government support. To date, this is lacking in spite of the existence of a policy document on EE (G.o.Z, 2003). Environmental laws should be designed to address the local context if they are to be relevant to the existing communities (Ketlhoilwe, 2007). In Zimbabwe, this has not always been the case.

For example, Chandiwana and Moyo-Mhlanga (1996, 143) argue that '*Environmental management and conservation (in Zimbabwe) has generally tended to be based on Western 'scientific' practices. Land degradation and its various causes, for example, deforestation, poor agricultural practices, and lack of knowledge about land-use management have tended to be singled out as the main issues to be tackled…The local*

communities have rarely featured in these government/nongovernmental organisation inspired endeavours. They have rather been seen and considered as part of the problem, degrading their environment by...overstocking, cutting down trees and ploughing down slopes'.

Fourthly, EE programmes should start at an early stage in life as part of primary socialisation. It should not wait until adulthood when it is already late. Furthermore, the programmes should target communities rather than focusing entirely on schools, colleges and universities. Providers of EE such as EMA, PWMA, AGRITEX and NGOs should cooperate so that they can be more effective at the grass roots level. Community based EE awareness groups should be established at the local level, supported by EE centres, which provide resource back-ups and data banks. Training more EE experts who can hold awareness campaigns in various communities is also necessary as well as decriminalising some activities and creating alternatives for them such as countering deforestation with reforestation and rural electrification schemes. People should also be educated on the importance of natural resource conservation including: trees, soil, water, wildlife, mountains and maintaining a clean environment. Donor funding of community based EE campaigns should be solicited from the international community while more use of the internet as a source of information should be encouraged at the community level especially where facilities/resources are available.

5.11. Knowledge of EE/ESD Issues

Some attempts by members of the public to define EE yielded the following excerpts (Table 5. 6). Although most (140) respondents attempted, some (60) failed to define it and either left blank spaces or expressed ignorance. The majority of those who made attempts to define EE equated it with: *conservation education*, *environmental management*, and *environmental science*. However, the only accurate definition of the term is the last one (l) on the table. The general lack of correct EE definitions implies that members of the public lack in-depth knowledge of these issues just as Ketlhoilwe,s (2007) study in Botswana has shown. It also shows that the EE awareness campaigns

offered by EMA and its partners have not been effective either, an issue which has to be addressed urgently.

If ordinary citizens lack correct information about EE issues, they can not be expected to change their attitudes, behaviour and lifestyles as Fien (1993) suggests. Existing literature shows that true education should lead to social transformation (Sterling, 2004). This implies that the EE provided by EMA and its partners should enable ordinary citizens to participate in solving real life (environmental) problems which confront them on a daily basis. The lack of adequate information on EE issues is likely to undermine EE programmes.

According to Ketlhoilwe and Maila (2008, 134) '*Learning in the context of an environmental and sustainability…programme should aim at transforming society. Teachers would be expected to play the role of change agents…, while learners are actively involved in the learning processes. Transformative learning involves greater reconstruction of meaning, achievement of greater flexibility and less rigidity of thought and more emergence as a result of learning*'. Although this quotation applies to higher education in Botswana, it can also be applied to EE in general including among ordinary people. It is clear that EMA and its partners have been ineffective change agents in their delivery of EE/ESD information to members of the public in Zimbabwe. For this reason, there is a need to re-orient their strategies towards more socially transformative EE approaches.

Table 5.6: Definitions of EE from ordinary citizens

Definition	Frequency
It refers to organised efforts to teach about how natural environments function and how human beings can manage them	23
Informing the general public about the importance of the environment	37
Education to do with environmental issues	14
No idea	60
Education on the proper use and management of the environment	18
Awareness on environmental issues	24
Studies about environmental issues	31
Learning to conserve natural resources	43
Imparting knowledge about the proper management of the environment	13
To learn about the environment and its component parts	17
Education, which gives awareness to issues and problems of the environment	20
A process of learning that increases people's knowledge and awareness of the environment and its associated challenges: how to counteract them. It fosters attitudes, motivations and commitments to make informed decisions and take responsible actions.	11

Source: Field Data

Attempts to define SD also yielded several responses such as: *development that meets the needs of the present without compromising the ability of future generations to meet their own needs, a pattern of resource use that aims to meet human needs while preserving the environment, wise use of the environment for future benefit and proper management of the environment,* u*sing resources without compromising needs of future generations, use of the environment with a futuristic perspective* while some 100 respondents had no idea. The remainder viewed it as*: studies on the wise use of resources for the benefit of future generations.* Although sound definitions (such as: the first, second, fifth and the seventh) emerged, the 100 (50%) of respondents who expressed ignorance of the concept is a cause for concern. Obviously members of the public are less familiar with SD than EE.

Since SD has been a household term for the past three decades, this is worrying as it is taking too long for communities to grasp the concept. Only 80 (40%) of the respondents attempted a definition of the term ESD, reflecting a general lack of information on the term. Again, this is an issue that calls for urgent action from EMA and other providers of EE. In general, members of the public know less about ESD than EE and SD, respectively (Table 5.7). Obviously, there is a need for more awareness campaigns on these issues. However, this can not be realised without adequate funding of providers of EE/ESD such as EMA and its partners (Mapira, 2012a).

Table 5.7: Definitions of ESD from ordinary citizens

Definition	Frequency
a) *Studying environmental issues with the focus of making wise use of resources*	12
a) *Education that imparts skills and knowledge on the use of the environment and aims to pass those resources to future generations*	7
b) *Education for the environment*	21
c) *Education that enhances the use of the environment without compromising needs of the next generations* d) *Wise words used to describe the way to use resources for the benefit of the future generation*	12
e) *To keep and conserve soil to help the coming generations to appreciate their environment*	6
f) *It is a combination of EE and SD*	3
g) *Using the resources sparingly with the next generations in mind.*	5
h) No idea	14

Source: Field Data

On whether EE programmes in Zimbabwe were oriented to SD, some 90 respondents agreed, 60 disagreed while 50 had no idea and preferred to leave blank spaces. Those who agreed gave several reasons. Firstly, a forestation and reforestation programmes are being conducted while gulley reclamation is underway. Secondly, poverty reduction

through various donor organizations is in place, children learn EE at school, efforts to control soil erosion are being undertaken, and EMA is seen at work. Thirdly, development has to be in harmony with the environment, traditional leaders are controlling deforestation and communities are making efforts to control soil erosion. Natural resources such as soil, water, trees and grass need to be conserved and communities need training on how to keep their environment clean, safe and sound. Obviously, some of these responses (*such as soil and natural resources conservation*) equate EE with environmental management, indicating the lack of a profound knowledge of EE issues (Ketlhoilwe, 2007).

Those who disagreed were not aware of any EE programmes nor heard about EE in their areas *(Mhakwe, Chinyudze: Buhera, Manicaland).* Information on EE was also not available in Chipinge (Manicaland) and Beitbridge (Matebeleland).Finally, respondents were asked to make general comments about EE in Zimbabwe (Annexure 2: Question 18). From their statements, several observations emerged. In general ordinary people know more about EE than SD and ESD, respectively (Table 5.8). Most rural communities need more awareness campaigns while there is also a need to incorporate indigenous knowledge systems (IKS) into conventional knowledge and include them in the school curriculum (Mapira, 2012a).

Table 5.8: Knowledge of EE, SD and ESD among members of the public

Term defined	No. of people who correctly defined the term	% of the total
EE	140	43.75
SD	100	31.25
ESD	80	25.00
Total	320	100.00

Source: Field Data

Since some rural people do not know about EE, there is a need to educate them about the environment and its well being in areas like Bako (Gutu), Masvingo and Mhakwe

(Chimanimani), Manicaland. EE programmes should be conducted regularly in different sections of society while EE should be taught in schools as a separate subject according to recommendations of this study. In general, more awareness campaigns should be held in all rural areas of Zimbabwe as they are vital for environmental transformation and management. Government should also show more political commitment on the implementation of its EE policies than it has done in the past. Its casual approach to EE issues sends a negative message to ordinary citizens, who in turn fail to take environmental issues seriously. The fact that EMA is under-staffed, under-funded and under-resourced, reflects government's lack of commitment on EE issues and this negative attitude spills over to ordinary citizens who depend on the environment for their survival (Chandiwana, 1996).

5.12 General comments on the Zimbabwean non-formal and informal EE/ESD providers

EE providers in Zimbabwe are backed by a policy document, which is both detailed and comprehensive, leaving no room for ambiguity at the implementation stage (G.o.Z, 2003). Compared to some African countries which still lack clear visions and policies on EE such as Botswana (Mukute.et.al, 2012), Zimbabwe has made huge strides. Together with some of its SADC neighbours, the country has in the past received foreign donor aid for the support of its EE programme as the following report (SADC REEP, 2008:6) confirms:

'*Through the Danida-funded Regional Environmental Education Support (REES), the SADC engaged in the analysis and development of policy processes for environmental education at the regional, national and local levels. The programme also contributed to the development of national environmental education policy processes in Lesotho, Namibia, South Africa, Tanzania, Zambia and Zimbabwe*'.

Although their contribution in the dissemination of EE is still quite low compared to that of the formal education sector, they play an important role at national level. While some of the organisations (such as AGRITEX, FC, PWMA and urban councils) date back to

the colonial era and therefore have a fairly long history, others are quite new. For example, EMA was established in 2007. It has not yet forged linkages with some of its older partners due to resource constraints (Mapira, 2012a) as this study has shown. This has undermined its effectiveness at local and national levels. Due to the challenges it has been facing since its inception, it is struggling to make an impact in the execution of its mandate (G. o. Z, 2009). That is why it is not quite visible at the grass roots level as this chapter has shown. Other EE providers experiencing similar challenges include: cash-strapped urban councils, the print media and the department of Arts and Culture.

However, in terms of goal achievement, the FC is an exception. It is the only EE provider in Zimbabwe which is self-reliant in terms of funding and does not require government support in its regular operations. For this reason, it can be considered as a role model or success story in terms of financial stability at national level. Other EE providers (such as EMA) can draw some lessons from its experience. Since the government is always cash-strapped, these organisations should develop strategies of self-reliance and break away from their dependency syndrome. The development of income generating projects such as that established by the FC is a possible solution. This should be the long term goal of all EE providers in the country if SD has to be achieved (G.o.Z, 2009). The conceptual framework (Chapter 3) has already identified poverty and resource constraints as major obstacles to the success of EE programmes in developing countries (Ketlhoilwe, 2007). If this challenge is addressed, chances of success are likely to improve in Zimbabwe.

5.13 Summary

This chapter has discussed the main findings of the study through an examination of non-formal and informal organisations, which provide EE in Zimbabwe. The organisations include: the Ministry of Mines and Mining Development, government departments (including: EMA, FC, PWMA, AGRITEX), urban councils, NGOs, the media, Arts and Culture. Their objectives, activities, achievements and challenges were identified as well as their possible solutions. This was done in the light of the research questions, objectives and conceptual framework which were presented in previous chapters. Responses from members of the public who were interviewed in order to determine the visibility of

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informal and non-formal organizations, which provide EE in the country, show that they are less conspicuous than schools, colleges and universities. This is partly due to the fact that the formal education sector is better equipped to disseminate EE due to its resources such as class /lecture rooms, equipment and personnel.

While EMA and some NGOs are fairly visible, other EE providers such as AGRITEX, FC, PWMA and urban councils are still obscure. The Ministry of Mines and some mines are only visible around mining communities such as: Bikita Minerals, Mimosa and Murowa. Further away, their impact is hardly felt. In general, the formal education sector (schools, colleges and universities) plays a greater role (83.8%) in the provision of EE than its informal and non-formal counterparts which reach a smaller section of the population (16.2%). Non-formal and informal organisations such as EMA need more funding if they have to be more effective in executing their mandate (Mapira, 2012a). Without government support, they are not likely to improve their visibility at the grass roots level, which undermines the effectiveness of their EE campaigns at local and national levels. However, this should be viewed as a temporary solution as they should be self-reliant in the long run. This can be achieved through the creation of income generating projects such as those adopted by the FC.

A major weakness of the type of information that has been disseminated to members of the public is its lack of depth as shown by definitions given by most respondents in this study. This is a problem which policy makers should address as soon as possible if EE/ESD goals have to be achieved. For example, SADC countries in general have been advised to continue supporting short term training that is informed by the needs of Member States, organise periodic fora to address issues of ESD policy and practice and tap into the tried and tested wisdom of ordinary citizens, academia, government and business (Mukute, et.al, 2012). This implies that the findings derived from research efforts (including this one) should be taken seriously for the benefit of the whole region. The next chapter examines the role of the formal education sector in the provision of EE in the country.

CHAPTER SIX: EE IN THE FORMAL EDUCATION SECTOR

6.0 Introduction

As mentioned previously, the formal education sector, (which includes: pre-schools, schools, colleges and universities), is a major provider of EE in Zimbabwe, reaching nearly 84% of the national population as the previous chapter has already shown. This is not surprising considering the fact that schools out-number their non-formal and informal counterparts. Although EE has not yet been introduced in pre-schools just as is the case in Uganda (Palmer, 1998), there are plans to do so in future (G.o.Z, 2003). There are two education ministries in Zimbabwe, namely: the Ministry of Primary and Secondary Education and that of Higher and Tertiary Education. While the former provides: pre-school, primary and secondary education, the latter offers college and university education. Soon after independence in 1980, Zimbabwe embarked on a mass education campaign, which has raised literacy levels to nearly 92% thereby over-taking Tunisia, which used to have the highest rate on the African continent (CSO, 2012). This chapter discusses the role of schools, colleges and universities in the provision of EE in the country. This is done in the light of research questions, objectives and the conceptual framework of the study.

6.1 EE in primary schools

The Environmental Science (ES) syllabus for primary schools (*ES Syllabus*, 1994), among other things, seeks to educate pupils about the **scientific relationship between people and the environment** as well as **inculcating a positive interest in the environment**. It also aims to develop an appreciation of a well-managed environment and use scientific knowledge and skills to influence and manage the environment. Furthermore, it strives to develop an awareness of the usefulness of science in the environment and to encourage creativity and inventiveness in scientific learning and interpretation with the environment. Finally, it seeks to inculcate positive attitudes towards healthy living and hygienic conditions, and develop an inquiring mind at problem solving. If all these aims are achieved, they lay a firm foundation for EE/ESD,

which can be taught at a later stage, if not concurrently. The syllabus' pupil-centred and problem-solving approaches encourage creativity and innovativeness in addressing environmental problems.

However, some researchers have noted that Zimbabwe's education policy is marred by a **rhetoric-reality gap** which should be closed if the objectives of EE/ESD are to be achieved (Chikunda, 2007). For example, both the curriculum and community relations with schools should be addressed as a matter of urgency (Shumba, et. al, 2008). This will have to involve the '*process of re-aligning the whole education system with ESD goals. Recently, the 1999 Presidential Commission of Inquiry into Education and training in Zimbabwe…recommended a paradigm shift in education to make it heavily reliant on local context, knowledge, needs and priorities. As argued in this paper, improvement of basic education and re-orienting existing education should aim at developing knowledge and skills for citizens to jointly identify their problems and act on them in a sustainable manner. This is likely to involve changes in educational philosophy…and also bring about closer relationships between schools and their communities in the learning process*' (Chikunda, 2007:168-169).

Knowledge of EE, SD and ESD

The knowledge and mastery of key terms is an indication of the effectiveness of EE/ ESD programmes as Ketlhoilwe's (2007) study in Botswana has shown. Responses (quoted verbatim or paraphrased) from some primary school teachers in Zimbabwe (Annexure 3), show that most of them have problems in defining EE. Although the responses bear some truth about ES, they do not provide correct information about EE. For example, an important goal of EE is to encourage learners to **take action that is geared at solving environmental problems, especially at the local level**. None of the listed definitions below mentions this important fact (Table 6.1). According to Fien (1993), any EE programme that is not based on **education for** the **environment** is not likely to yield positive change towards the environment. However, this is not surprising since EE in Zimbabwe is based on **education about** and **through** the environment (*ES Syllabus*,

1994). EE is also not taught as a separate subject but as part of Social Studies at primary school level.

Table 6.1: Primary School Teachers' Definitions of EE

Definition	Frequency
It (EE) is education about the environment and what is found in it	33
EE is the study of man-made and natural resources within the local place or school	15
This is whereby people study about things surrounding us	9
EE deals with the environment/our surroundings	12
The study of man and his environment	35
Giving pupils knowledge of the environment or their surroundings	15
Learning about the surroundings	10
A study of the environment or specific areas	3
Teaching and learning of the environment	4
A form of education, which seeks to develop an understanding of environmental issues so as to produce positive attitudes towards the environment.	11

Source: Field Data

The last response on the table however, provides the most sound (though not accurate), definition of the concept. The missing element here is *action for the environment*, which

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has the potential to change people's lifestyles (Fien, 1993). Although the definition mentions *positive attitudes toward the environment*, this remains a vague or theoretical statement unless it is backed by action on the ground (Chikunda, 2007). In reflecting on the concept of sustainability and higher education at global level, Le Grange (2011, 744) has warned that the term (*Education for sustainability*) runs the risk of degenerating into a mere slogan '*for consumerism and unbridled economic growth*' if societies are not prepared to change their lifestyles. The same criticism can be levelled against Zimbabwe's EE programmes which advocate positive attitudes without taking any serious action on the ground (Chikunda, 2007). The ES syllabus wrongly assumes that people's attitudes will change without major sacrifices at the personal or individual and societal levels (Mapira, 2012a). It has already been noted that societies whose EE programmes have been successful are those that are prepared to sacrifice their materialistic goals for the sake of environmental protection (Palmer, 1998). This is not the case with the situation in Zimbabwe, as this study shows.

Teachers also had problems in defining SD. While some regarded it as *capacity utilisation of available resources* or *development of a nation,* others defined it as *a balance in supply and population.* Some called it *good use and management of resources for economic development* while others thought that it was *development meant to sustain one's life.* Furthermore, some teachers considered SD as *the development that people can rely on* while others defined it as *activities done by people in their community that support their way of life.* Finally, some viewed it as *the wise use of the environment or acquisition of knowledge on survival skills* while others considered *it as manageable progress.*

These responses range from erroneous and nonsensical to fairly sound ones. The Brundtland Report's definition of the concept as mentioned in Chapter One is that it is a form of development which '*meets the needs and aspirations of the present without compromising the ability to meet those of the future*' (WCED, 1991: 40). The failure of some teachers to define the concept has several implications. Firstly, the ES syllabus does not include the concept, which is a fundamental weakness of the document from an EE

perspective. It is unfortunate that most teachers of ES cannot define household terms such as SD.

If teachers cannot define this concept, their pupils are less likely to do so. Perhaps the ES syllabus should be revised in order to incorporate EE concepts. Without a profound understanding of these concepts, it is difficult for teachers to educate their pupils on EE issues just as Ketlhoilwe's (2007) study has shown. The assumption that primary schools are providers of EE will remain illusory until concrete measures are taken to revise the school curriculum in order to incorporate EE issues (Chikunda, 2007). Finally, there is a need for staff development on EE issues throughout the country's primary schools just as Ketlhoilwe' s (2007) study recommends for Botswana.

Most teachers also had problems in defining ESD. The acceptable definition of ESD is that it refers to a type of education, which marries EE with SD thereby generating a new zeal to EE (*SADC EE/ESD Report*, 2006). While some teachers claimed that it referred to *the environment that people rely on,* others regarded it as *activities done by people in their community in order to support their way of life.* Some defined it as *education based on environmental resource issues, development of a nation or even development of an institution.* None of these definitions is correct. For example, there is no mention of the spirit of **environmental stewardship** which is central to ESD (Fien, 1993).

Others thought that it had to do with: *giving knowledge to people about their surroundings to help them to keep going and reach an advanced stage.* Some claimed that it *involved educating people on how to develop the environment* while to others it had to do with *meeting the development of set goals about the environment.* Finally, some defined it as a *learning process that enables learners to improve their surroundings* while others considered it as the *use of resources in a particular area to satisfy needs of residents.* However, other teachers had a better, though superficial knowledge of the concept.

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Some defined it as e*ducation that focuses on dealing with and maintaining the environment* while others regarded it as *a process of acquiring knowledge and awareness of surroundings in which a person operates for apt management of the physical environment.* Such teachers erroneously equate ESD with environmental management just as some of their counterparts in Botswana's primary schools (Ketlhoilwe, 2007). Some regarded it as *education related to economic development and wise use and management of the environment* while others thought that it was *teaching children about the wise use of the environment.* On the other hand, some defined it as *education for the environment to improve the future* while others regarded it as *environmental awareness to meet the development of set goals about the environment.* Finally, some considered it as *a form of education which develops the needs of the present generations without endangering the future.*

Although ESD has brought a new zeal to the older concept of EE, it has been criticised for its failure to change ordinary people's attitudes, lifestyles and behaviour toward the environment (Fien, 1993). Some 30% of the respondents failed to define the concept and left the spaces blank. This failure probably reflects their lack of exposure to the concept, an issue that should be addressed if ESD has to be successful in primary schools (Chikunda, 2007). The large number of primary school teachers who cannot define this basic concept is a cause for concern. It implies that the ES syllabus does not enlighten them on the meaning of the concept. The need for staff development on EE and ESD issues is obvious in this case (Ketlhoilwe, 2007).

In response to Question 7 (Annexure 3) which asked whether Zimbabwean EE programmes were oriented to SD, 960 teachers agreed while 40 disagreed. Reasons given by those who agreed included the fact that EE encourages the conservation of natural resources and it advocates the re-cycling of used materials thereby reducing waste in the environment. EE also encourages the maintenance of an ecological balance in the environment thereby safeguarding the latter. It advocates for a clean environment that promotes good health as well as teaching pupils and communities to conserve natural vegetation, maintain roads and grow vegetables for food. Furthermore, EE instils a sense

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of environmental stewardship among communities and teaches pupils about the importance of the environment. It encourages communities to exploit their resources in a responsible manner that seeks to conserve them for future generations and endows communities with knowledge and skills of environmental protection.

EE encourages the involvement of some NGOs in promoting environmental protection and some teachers have attended EE workshops which have been beneficial to them, their schools and communities. EE promotes SD by equipping communities with the necessary knowledge and skills of environmental protection and conservation and teaches people about the advantages of planting trees, protection of water bodies, crop rotation and preventing veldt fires. EE teaches children at an early age to take care of their environment thereby making them responsible citizens at a later stage in life and promotes the conservation of natural resources including wildlife. EE programmes make pupils aware of the dangers of not managing their environment properly. Skills acquired from EE train pupils to become responsible citizens while it gives teachers and pupils a chance to plan ahead and think of future generations (Fien, 1993).

Those who disagreed gave reasons such as: the fact that EE programmes do not cover all parts of the country. Hence some communities never benefit from them. Others had never heard about them. Most people are ignorant of them and continue to poach wildlife and cause veldt fires, and that nobody had ever informed them about it. While 960 (96%) teachers thought that EE programmes in Zimbabwe were oriented to SD, some 40 (4%) disagreed. It is surprising to note that some teachers, though few, have never heard about EE a decade after the promulgation of the country's EE policy (G.o.Z, 2003).Possible solutions suggested by the respondents (Annexure 3 No.11) included the fact that the curriculum development unit (CDU) should review the primary school syllabus and that EE/ESD should be clearly stated in the preamble of the syllabus while staff development workshops on EE/ESD should be held in order to educate teachers on these issues (Mapira, 2012a).

Problems encountered by teachers in the teaching of EE/ESD included: the shortage of resource persons or experts to train teachers on EE/ESD issues, lack of space on the time table, which is overloaded, inadequate resources to implement the teaching of EE/ESD for example textbooks and other forms of literature, and lack of funds for field trips and equipment for experiments. Chikunda (2007) has identified similar problems in his study of Zimbabwe's BEST programme. Furthermore, he criticizes the education system for its failure to re-orient its teaching and learning methodologies in line with the new goals of EE/ESD dissemination. However, this problem has also been noted in Botswana (Ketlhoilwe, 2008) and other SADC countries (SADC REEP Report, 2006) as mentioned previously.   Other problems which have emerged from the present research effort include: little or no government commitment on EE/ESD issues, results in apathy at the grass roots level, lack of media support on the dissemination of EE/ESD information, insufficient staff development workshops on EE/ESD, and lack of alternative sources of energy especially in rural areas where people depend on wood fuel. This encourages deforestation and undermines efforts aimed at the conservation of natural resources (Chandiwana, 1996).

Suggested solutions for these problems included: *the production of teaching materials (such as text books and learning aids) on EE/ESD by the CDU, inclusion of EE/ESD in the curriculum so that it can be accommodated on the school time table and conducting staff development workshops on EE/ESD at either district or school levels*. In addition, the provision of teaching/learning resources in schools including: radio, television and the internet are necessary as well as involving pupils in EE/ESD projects at the community level is also necessary. The recruitment of resource persons to educate teachers on EE/ESD issues and introducing a levy that can be used to build resources for the teaching of EE/ESD in schools are also necessary. Furthermore, rural electrification aimed at reducing dependency on wood fuel, which encourages deforestation should be prioritised (Chandiwana, 1996) as well as conducting community based educational trips to places of EE/ESD interest (Chikunda, 2007). Establishing EE Centres, laboratories, and libraries that can be used for teaching purposes, and using the media more effectively in the dissemination of EE/ESD information are also important considerations (Mapira, 2012a).

Written Work

Written work given to a Grade 3 class at Shakashe Primary School in the city of Masvingo during the last term of 2012 covered ES topics on weather variations according to seasonal changes (Table 6.2). In each case, simple definitions and brief explanations of concepts were provided and pupils had to fill in missing words in their written exercise books. The written work laid emphasis on the inculcation of scientific facts **about** and **through** rather than action **for** the environment (Fien, 1993). The exercises comprised ten questions each including simple sentences that suited the pupils' level. The class room walls were covered with charts, which depicted the map of Zimbabwe, natural vegetation, life cycles of disease vectors such as the house fly and the mosquito.

Table 6.2: Written work for Grade 3A (2012)

Date	Topic
19/09/2012	Weather Changes
27/09/2012	Seasons
3/10/2012	Seasonal Changes

Source: Shakashe Primary School Grade 3 Content Exercise books

These displays confirm Chikunda's (2007, 166) view that areas emphasised by Zimbabwe's education system '*seem to be those traditional aspects of education considered important in vocational/neoclassical pedagogy. By putting so much emphasis on charts and written work, supervisors show that they believe the teacher should be the bearer of knowledge which should be transmitted effectively to learners. Charts and other teaching and learning support materials such as those in the science corner, aided by other pedagogical dynamics such as pupil-pupil interaction mostly in smaller groups, facilitate the transmission of this knowledge. Written exercises test acquisition and mastery of what is considered worthwhile knowledge. In the learning process, teachers and learners do talk about the environment. Learners bring samples from the*

environment and there is an appreciation of problems that the environment is facing, but the integration of school activities and community activities, is largely neglected'. It is doubtful whether these approaches can adequately address the prevailing environmental challenges (Mandishona, 1996). Relevant education is expected to enable schools and communities to jointly solve their problems (Chikunda, 2007). In this case there is no doubt that the lack of interaction between communities and schools is a weakness which should be addressed as soon as possible if sustainable development has to be achieved (Shumba, *et.al*, 2008).

6.2 EE in Secondary Schools

Just as in the case of primary schools, secondary schools do not offer EE/ESD as a separate or individual subject. This is because the curriculum is already over-loaded (G.o.Z, 2003). This problem also applies to the Kenyan EE programme as mentioned previously (Otiende, 1997). This weakens and undermines the quality of education provided as little attention is paid to EE/ESD concepts. Just as in the Ugandan case, the examination does not lay emphasis on EE/ESD themes (Palmer, 1998). To date EE concepts have not yet been infused in O'Level Agriculture, Geography and Science as schemes of work have shown. However, it is hoped that in future they will be infused in all subjects at all levels of schooling (G.o.Z, 2003). A major weakness of the secondary school curriculum in Zimbabwe has been its failure to integrate EE issues into the existing subjects since the promulgation of the country's EE policy a decade ago.

To date there is no continuity from primary to secondary school in the teaching of EE concepts, a gap that has been noted by some researchers (Murwendo, et.al, 2009). This discontinuity is a cause for concern as it accounts for the lack of EE literacy at the secondary school level. As a result, most secondary school teachers had problems in defining EE (Table 6.3) since EE has not been introduced in these schools. Due to the lack of literature, most teachers rely on their common sense for definitions of the term. It is also pertinent to note that some teachers expressed total ignorance of the term including those of Economics, Commerce and Business Studies. Even some teachers of Geography had a vague idea of the concept.

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Table 6.3: Definitions of EE from some secondary school teachers

Definition of EE	Subject/s Taught
EE is education on the importance of our surrounding	History
A study focusing on the conditions of the atmosphere in which people live and work.	Physical Education
EE is the study of biophysical surroundings and interaction of mankind with it	Computer Science
I don't Know/I have no idea	Business Studies, Commerce, Economics, Shona and English
Education that has to do with the environment	Computer Science
Teaching pupils about the area around us	Geography
Imparting knowledge about our environment to the society	Computer Science
Awareness of the importance of the environment	Commerce and Wood Work

Source: Field Data

However, others had a better, though vague/superficial understanding of the concept as the following excerpts show: *EE is education about the environment (*Geography teacher*), It is education inclined to the prevention of environmental degradation (*Mathematics teacher*), Imparting environmental awareness on school children (*Geography teacher*), It refers to awareness and protection of the environment (*Commerce teacher*), Enlightening people about environmental issues (*Geography teacher*), EE is the teaching of environmental awareness (*Wood work teacher*), Teaching the public on the importance of and how to conserve the available resources (*Geography teacher*), Teaching pupils about their surroundings and how best they can use them without interfering with the ecosystem (*Teacher of Agriculture*),* and *Education on the importance of the environment and how to take care of it (*Geography teacher*).* Most of

these teachers erroneously equate EE with environmental management just as Ketlhoilwe's (2007) study on Botswana has shown. This is not surprising as most of them have not received adequate training on EE/ESD issues (Chikunda, 2007).Their syllabi (for example: agriculture, geography and science) lay emphasis on scientific knowledge about the environment rather than EE/ESD (Mapira, 2012a).

Secondary school teachers also need a better understanding of the SD concept if they are to be conversant with EE issues. As mentioned previously, the WCED (1991) defines SD as a form of development which seeks to meet the needs and desires of present generations without compromising those of future generations. In response to Question 6, which asked them to define SD (Annexure 3), some teachers had problems as shown by the following quotations in Table 6:4. Most of the responses in the table are erroneous, indicating a lack of knowledge on the concept. Even some geography teachers could not provide correct definitions, reflecting the general lack of information on the concept. This is surprising as the SD concept has been a topical issue for the past two decades (Miller, 1994).

However, others had a better understanding of the concept as the following excerpts show: *Utilising resources in a way that enables future generations to use the same resources (*Geography teacher*), It is when one carries out activities meant to gain income, food or wealth but not forgetting to restore the damaged means of production in the process (*History and Religious Studies teacher*), Development which meets the needs of the present without compromising the needs of future generations (*Geography teacher*), Development that is sustainable on the environment* (Mathematics teacher*), Development meant to benefit present and future generations through environmental awareness and conservation (*Geography teacher*),Wise use of available resources (*Computer Science teacher*), Making developments that are environmentally friendly (*Commerce teacher*), Use of natural resources and keeping them for future generations (*Wood Work teacher*), and This is development that achieves production sufficient to meet the needs of present and future populations (*Teacher of Agriculture*).* An examination of the above responses shows that some teachers equate SD with

conservation education or environmental management. Only a few have a correct view of the concept, indicating the need for staff development workshops on this issue (Chikunda, 2007).

Table 6.4: Definitions of SD from some secondary school teachers

Definition	Subject Specialisation of Teacher
It is a situation where the majority of people implement what they have been taught in environmental education	Geography
Maintaining the standards of living	Physical Education
Development that can sustain people	Commerce and Accounts
It is one's ability to take care of oneself	English and Shona
Management which benefits the present generation without compromising the needs of future generations	Home Economics
I don't know/No idea	Religious Studies, Shona, Economics, English, History, Business Studies and Commerce
Development that is locally designed	Computer Science
SD is the betterment of a community in any field of endeavour	Physical Education
That which will benefit future generations	Geography
It is the maintenance of a good environment	Mathematics
Taking care of the resources for future use	Geography
SD is the improvement of the environment to make it stable	Commerce and Wood Work
It is development that can be sustained	Geography

Source: Field Data

The ESD concept also proved difficult to define among some teachers as the following quotations show (Table 6: 5). This is not surprising given the fact that most of them have not yet been exposed to the concept. Without adequate literature on EE and ESD issues, teachers are not likely to develop a better understanding of the concepts. ESD refers to a type of education, which fuses EE with SD thereby generating a spirit of environmental

stewardship among citizens (Fien, 1993). Some teachers seemed to have a better understanding of ESD even though the distinctions between it, conservation education, environmental management, SD and EE were not clear. For example, a geography teacher defined it as t*eaching pupils to preserve and conserve the environment* while a teacher of home economics viewed it as *education on ways of wisely managing the environment.* On the other hand, an agriculture teacher viewed it as *educating people about using available resources sparingly* while another teacher of geography regarded it as *education on ways of wisely managing the environment.*

According to a mathematics teacher ESD refers to *learning about how to maintain natural resources* while a teacher of history thought that it was *a process in which one gains knowledge about how to both extract wealth and rehabilitate the damaged source of wealth.* A commerce teacher viewed it as a strategy of *taking care of the environment and making development that is environmentally friendly* while some geography teachers defined it as*: education on good use of the natural resources for the future generation, educating pupils about conserving the environment, teaching people how to utilise resources sustain-ably, and imparting conservation skills in children for the benefit of both the present* and *future generations.* Obviously, most teachers equate ESD with environmental management just as Ketlhoilwe's (2007) study that was conducted in Botswana has shown.

The above definitions also reveal that most teachers do not have a full understanding of the differences between EE and ESD. However, this is not surprising considering the fact that at global level most people have problems in distinguishing their differences as well (Fien, 1993). In response to Question 7 which asked respondents whether EE programmes in Zimbabwe were oriented to SD some 283 agreed, 151 disagreed and 52 left the spaces blank. Reasons given by those who agreed included the claim that *EE programmes encourage the protection of natural resources, they teach people how to care for their environment, their programmes encourage communities to utilise their resources property and they enable people to protect and preserve their environment.* Other reasons given were that t*hey enabled communities to be environmentally friendly,*

which promoted SD at the local level, and they endowed people with skills on how to protect their environment for present and future generations. Some respondents were unable to suggest reasons as they claimed ignorance.

Table 6.5: Definitions of ESD from some secondary school teachers

Definition	Subjects Taught
Use of natural resources for the development of communities	Accounts
Study of the environment to maintain standards of living	Fashion and Fabrics
Education that teaches people to maximize the use of their environment	Accounts and Commerce
Basic life to assist one to be self-dependent	English and Shona
Enlightening oneself on one's environment and its way of operation	Geography and English
No idea	Mathematics, Science, Religious Studies and Shona
It's a study targeting the improvement of any given society	Physical Education
Giving all necessary information for having a stable environment	Commerce and Wood Work
Learning about how to maintain natural resources	Mathematics
Giving all the necessary information for having a stable environment	Commerce and Wood Work

Source: Field

Among those who agreed, some expressed ignorance. Possible reasons for their responses may include the fact that they had no idea of what SD orientation meant, and they answered the first question without much thought and when they came to the reasons,

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they had nothing to offer. Those who disagreed gave the following reasons: t*he programmes lack visibility at the grass roots level, EE programmes are short-lived hence their impact is limited, there is a lack of EE experts to educate the people, EE providers fail to reach some remote communities, hence they do not cover the whole country, school syllabuses do not include EE in their contents and EE has not yet been introduced in secondary schools.* Others knew nothing about EE programmes as they did not exist in their areas. It is clear that many respondents lack information about SD and EE, a fact that EE providers should know and address as soon as possible (Ketlhoilwe, 2007).

Question 9 asked respondents whether EE/ESD was included in their subjects. Some 210 agreed, 150 disagreed and 110 expressed ignorance. However, a perusal of their syllabuses showed that there was hardly any mention of the concepts. Problems encountered in the teaching of EE/ESD in secondary schools, according to the respondents, included: *lack of literature on the concepts such as text books, shortage of practical examples on the ground, lack of EE centres in the country, since these concepts do not appear in the syllabuses, they are not taken seriously by teachers and students, most teachers have not been trained on EE/ESD issues, hence they are not conversant with them, and limited teaching resources*. Just like other SADC countries Zimbabwe lacks adequate resources for the dissemination of EE/ESD information (Molapo, 1999).

Other challenges were: *poverty which undermined EE/ESD especially in rural areas where there are no alternative sources of energy and timber for construction purposes* (Shumba, et.al, 2008). EE/ESD topics are neither *time-tabled nor are they examinable*. Hence teachers pay little or no attention to them. Furthermore, the *under-staffing of government departments* such as EMA under-mines efforts to conduct out reach programmes in schools and communities (G.o.Z, 2009). In Geography EE/ESD issues are sporadically taught as topics rather than as a separate subject, so little time is allocated to them. Financial constraints also undermine field trips in some schools while in most cases EE/ESD discourses are highly theoretical due to the lack of practical examples on the ground (Mapira, 2012a). There are no laboratories for experiments, hence teachers and students rely on theory, and lack of material support (such as teaching materials) from

policy makers (Government and CDU). Teaching methodologies are still teacher centred, based on neoclassical philosophies as Chikunda's (2007) study has shown. Unless drastic changes are made to the present school curriculum, no meaningful improvement can be expected in the country's schools.

Solutions suggested by respondents included: *revision of syllabuses with the aim of incorporating EE/ESD issues, allocation of more time for EE/ESD on the school time table, making EE/ESD examinable so that it can be taken seriously by both teachers and students, seeking for donors who can fund these programmes in schools and communities, conducting more training workshops on EE/ESD in schools and communities, establishing EE centres throughout the country, policy makers and politicians should show commitment on EE/ESD issues and prioritise them, tougher measures should be taken against those who transgress environmental laws, and EE/ESD should stand as a subject on its own and should be compulsory in secondary schools*. Most of these solutions can also be suggested for other SADC countries as some researchers have observed (Mukute,et.al, 2012).

Alternatively, EE/ESD can be infused into the curriculum through curriculum greening (Mbiba, 2003). Other solutions mentioned included suggestions such as that: *it should start from primary school and should include safety, health and environment, government should allocate more funds for EE/ESD programmes, chiefs and headmen should be directly involved in these programmes, and pupils should be given an opportunity to conduct field trips so as to expose them to places of interest*. These possible solutions concur with Chikunda's (2007) views on how a re-orientation of the school curriculum can close the gap between rhetoric and reality at both local and national levels. According to a recent report, the SADC region in general needs to '*empower people to make sustainable choices, inter alia through advancing education for sustainable development in all sectors of society*' (SADC REEP, 2012:6). On the other hand, the same report advocates for inter-disciplinary collaboration and increased capacity building on ESD issues at local, national and regional levels.

Syllabi, schemes and written work

The researcher visited several secondary schools in Masvingo Province and checked whether EE was being taught. The secondary schools included: Chirichoga, Makoni, Mucheke, Ndarama and Victoria. In all these schools, there was no evidence of EE in syllabi, schemes and written work in Geography, Science and Agriculture. This is because EE has not yet been infused in these subjects even though the policy document recommends its inclusion in syllabi (G.o.Z, 2003). Again, this reflects the lack of political will as well as poverty which undermine the implementation of policies in most SADC countries (Mukute, et.al, 2012). Questionnaires administered among Ordinary Level students (among other things) asked them to define EE, ESD and SD (Annexure 4 Question 8). For EE the following quoted responses emerged: *EE is about the environment, it is knowledge about our surroundings, EE is the study of communities and ecosystems, it is education which deals with the environment, EE is the study of the environment, the study of the earth and its environment, it is education on environmental awareness, education given to people on how to use the environment wisely, and is education in which sustainable development is taught.* Some expressed ignorance of the term, which they could not define.

While only a few students had a rough idea of EE, the vast majority could hardly define it as they had not been exposed to the concept at all, an issue that has to be addressed as a matter of urgency (Ketlholwe, 2007). The students also attempted definitions of ESD. Their responses included: that *ESD is education given to people on how to conserve natural resources so that future generations can use them also, it deals with teachings on how to conserve the environment, it is education on how to ensure good use of resources for present and future generations, and it deals with how to conserve natural resources.* They also viewed ESD *as education on how to preserve our resources or use them wisely for future use, It is education on how to use the environment wisely in order for it to develop, knowledge of the surroundings with the aim of development of the locality, education on how to sustain the future,* and as *educating the public in order to develop, and good management of the environment.*

Although some 68 students could not define the term, others viewed it as*: an equal development, ways of conserving the environment, development for the local community, learning of adults, development which can be recognized, education on sustainable environment, the quality of the environment, and development that does not affect the future.* Finally, some defined ESD as *education given for the environment to sustain development* while others viewed it as *the development of our areas.* Most O'Level students had problems in defining ESD even though a few gave fairly sound definitions of the term. However, the distinction between it and SD was not clear as the following excerpts show: it is e*ducation on how to save our resources for present and future use, the wise use of the environment in order for the coming generations to use and also develop it further, educating people to use resources wisely, the conserving of the environment for present and future use, and development that benefits the environment taking into consideration future generations.* The tendency to equate ESD with environmental management (or SD) is quite clear here, indicating the lack of in-depth knowledge on the issues (Ketlhoilwe, 2007).

Students also listed subjects in which EE/ESD concepts had been taught. They included: *Geography, Science, Agriculture, Biology, Commerce, English*, etc. in descending order (Table 6.6). It is pertinent to note that the first six subjects top the list while History, Shona, Computer Science and Bible Knowledge are at the bottom. In general, some teachers seem to be making efforts aimed at infusing EE/ESD concepts in their subjects even though syllabuses have not yet been revised in order to incorporate them. In this case the need to re-orient the curriculum in order to accommodate these concepts is obvious as existing literature has shown (Lotz-Sisitka, 2005).

Methods and sources used in the teaching of these concepts included: *teacher's knowledge* and *class discussions, library* and *the internet, workshops, advertisements* and *publications from media sources, pictures, photographs and posters, textbooks, environmental topics in Geography, Science, Agriculture and Biology, school-based environmental clubs, awareness campaigns organised by EMA, and school debates, speeches and quiz contests*. The predominance of neoclassical teacher-centred

methodologies is a cause for concern as it does not promote problem-solving learning, which has the potential to promote SD at local and national levels (Chikunda, 2007). According to a recent report, at global level '*Education, training and capacity are emphasised and seem to be an enabling condition of a more sustainable future*' (SADC REEP, 2012:7). Consequently, Zimbabwe should re-orient its education system if it has to achieve its ESD goals (Chikunda, 2007).

Table 6.6: Ranking of O'Level subjects, which taught EE concepts

Subject	Frequency (number of respondents)	Ranking
Geography	510	1
Science	311	2
Agriculture	172	3
Biology	110	4
Commerce	80	5
English	80	5
Physics	61	7
Mathematics	53	8
History	51	9
Shona	51	9
Computer Science	33	11
Bible Knowledge	32	12

Source: Field Data

Problems encountered by students in the learning of EE/ESD at the school level included, *the lack of experts on EE issues, inadequate teaching resources such as libraries and textbooks, lack of teachers who have been trained to teach EE/ESD, the lack of environmental sensitivity at school level and the surrounding communities, lack of funds for EE/ESD programmes, shortage of teaching venues such as laboratories, failure to interact with surrounding communities on EE/ESD issues, lack of free slots on the school time table, ignorance of the public on environmental issues, and poverty at the village*

level, which forces people to degrade their environments. Other problems encountered were: *population pressure among peasants, which results in competition for dwindling arable land and grazing areas, poor farming methods and the lack of alternatives, corruption among some EMA employees who set bad examples by soliciting for bribes in their daily work, and resistance from members of the public who lack a sense of environmental stewardship*. Most of these problems have been mentioned by other researchers such as: Chandiwana (1996), Mandishona (1996), and Mapira (2012a). Within the SADC region, similar problems also exist as research has shown (Mukute, et.al, 2012).

Solutions suggested for these problems included: *providing adequate funds to run EE/ESD programmes in schools and communities, recruiting experts/teachers who can teach EE/ESD in schools and communities, providing textbooks and other forms of literature, building adequate teaching facilities such as EE/ESD laboratories, conducting public environmental awareness campaigns such as anti-litter campaigns, inclusion of EE/ESD topics in some subjects, sponsoring EE/ESD field trips in schools, conducting EE/ESD based experiments at the school level, and internet facilities should be provided in schools in order to promote the teaching and learning of EE/ESD*. Both Chikunda (2007) and Mapira (2012a) have suggested similar solutions.

Other solutions included the *training of teachers on EE/ESD, provision of more Government support for school based EE/ESD programmes, and soliciting for donations from organizations which can sponsor EE/ESD at the school level. EE/ESD should also be included in examinations and on the school time table, while villagers and peasants should be trained to practise environmentally friendly methods of farming. They should also be involved in reclamation activities such as: soil erosion control, tree planting and water conservation projects*. Existing literature in the SADC region shows that EE/ESD programmes should address local problems and concerns if they are to be relevant to their communities (Ketlhoilwe, 2007). For example, in order to meet the increasing demand for EE/ESD literature at the regional level 'and deepen the SADC REEP's engagement with the production of low-cost materials, the programme changed strategy slightly and

worked towards providing guidelines for materials development, based on lessons learned in the first five years of the programme… (This) led to the production of a 'sourcebook' on Learning Support Development through a process of deliberation and consultative responses' (SADC REEP, 2012:57). This change of strategy was necessary as it addressed demand, local context, quality and relevance challenges which have emerged at the local and national levels (Ketlhoilwe, 2007).

Question 14 asked students whether EE programmes in their areas were oriented to the achievement of SD. While 420 agreed, the other 420 disagreed. The rest (60) were not sure. Reasons or benefits of EE given by those who agreed included: *promoting environmental awareness campaigns in communities, encouraging re-forestation in some areas, keeping the environment clean through anti-litter campaigns, encouraging natural resource conservation, increasing people's levels of environmental awareness, educating people on how to take care of their environment, and people are now able to preserve natural resources*. It was also noted that some teachers were now involved in the teaching of EE while ordinary people were now able to preserve natural resources. Furthermore, EE promoted the sustainable utilisation of resources in some areas, as well as encouraging villagers to adopt environmentally friendly methods of farming. These are commendable developments which should be supported by policy makers (Mapira, 2012a).

Those who disagreed also provided their reasons which included: *the fact that ordinary people lacked interest in EE programmes, EE does not reach all areas, it is not taught in all subjects, little or no EE is taught in schools, and most people are not aware of EE programmes*. Other reasons were: *the fact that the environment continued to be degraded by people, lack of government support on EE issues, scarcity of EE experts undermines the programmes, and it is not effective at the local or grass roots level.* Solutions suggested for the improvement of EE programmes included*: embarking on EE campaigns, which targeted schools and ordinary citizens, conducting more research and publications on EE, building EE centres throughout the country, adequately staffing organizations which provide EE such as EMA, training more teachers on EE issues,*

providing more literature on EE such as textbooks, posters and pamphlets, encouraging more NGO support of EE programmes, improvement of Government commitment on EE for example through financial support, provision of laboratories and other resources, practising reforestation in rural areas, reducing rural poverty, and practising good farming methods. These solutions are not only relevant to Zimbabwe but they can also be applied to other countries in the SADC region as ESD literature shows (SADC REEP, 2012). Other solutions were: *encouraging de-stocking, gulley filling, tree planting* and *the construction of terraces in steep areas, re-settling land hungry peasants, avoiding deforestation and over-grazing, and enforcing laws against poor methods of farming such as river bank cultivation.*

Female Advanced Level (A'Level) students (Annexure 4) also defined EE (Table 6.7). The responses were recorded separately in order to discover whether there were any differences along gender lines and subject specialisations of each respondent. It is pertinent to note that some students could not define the term at all. This shows that they have not yet been exposed to EE after five or six years of secondary education. Since schools are the main providers of EE/ESD in Zimbabwe (contributing to nearly 84%), as this study has shown, this reflects their ineffectiveness in the execution of their mandate (Chikunda, 2007). However, this is not surprising as EE/ESD concepts have not yet been infused in secondary school syllabi including science subjects such as biology, chemistry and geography (Mapira, 2012a).

Table 6.7: Female students' definitions of EE

Definition	Student's subject specialisation
Education given to people in order to enable them to keep our environment safe	Biology, Chemistry and Mathematics
It is education about the environment or our surroundings	Geography, Economics and Management of Business
EE is the education given to people to safeguard the environment	Geography, History and Divinity
It is knowledge about the environment	English, Divinity and Shona
EE is education given for the protection of the environment	English, History and Geography
Education given to people concerning their environment	Geography, English and History
I don't know/No idea	History, Shona and Divinity
It is the study of the management of the environment	Geography, History and Divinity
Teaching about the environment	Geography, English and Divinity
It is the study of land and its environment	History, Shona and Divinity

Source: Field Data

While some students equated EE with environmental management, others expressed total ignorance, indicating the need for rigorous training on the issue (Ketlhoilwe, 2007). Male A'Level students also provided their definitions, which were quoted verbatim (Table 6.8). Their responses were quite variable, ranging from total ignorance to erroneous ones and a few reasonable attempts. Obviously these students are no better than their female class mates in terms of their grasp of EE concepts, reflecting the need for the whole education system (including syllabi and teaching methods) to be re-oriented for more effective delivery of EE/ESD issues (Chikunda, 2007). Since education systems are based on some political ideologies, these will also have to change so that they are in line with the ideals and philosophies pursued (Fien, 1993).

Table 6.8: Some male A'Level students' definitions of EE

Definition	Student's subject specialisation
EE refers to education offered in different areas in relation to the environment	Mathematics, Economics and Business Studies
It is education on how to take care of the environment	Geography, Economics and Business Studies
Studying ways of protecting the environment	Geography, Economics and Management of Business
I don't know/No idea	Geography, Economics and Business Studies
Learning of the environment	Geography, Economics and Business Studies
It is knowledge of how any environment is kept clean	Geography, Economics and Business Studies
EE is an area which is suitable for learning	Geography, History and Shona
It refers to education offered within different conditions or areas	Mathematics, Accounts and Business Studies
EE is the basic teaching of the place you live in	Biology, Mathematics and Food Science

Source: Field Data

An attempt by female students to define ESD yielded several responses including: *This is education given to people to safeguard the environment for the future of their children* (Geography, History and Divinity), *Education on how to use resources in a sustainable manner for future generations* (Geography, Economics and Management of Business), *This is education given to people to safeguard the environment for the future of their children* (Geography, History and Divinity), *I don't know/No idea* (History, Shona and Divinity), *The wise use of natural resources* (Geography, History, Divinity), *Study of the surroundings and maintaining fragile environments* (Geography, Accounts and Business Studies), *ESD is education for the proper use of resources* (Geography, History and

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English Literature), and *Education given to improve the use of resources* (Geography, History and English Literature).

Male students gave the following definitions: *Teaching on how to conserve resources for future use* (Biology, Mathematics and Food Science), *Developing EE* (Mathematics, Business Studies and Economics), *Management of the environment* (Geography, M.O.B and Economics, Accounts, Shona and Divinity), *Good management of the environment* (Geography, M.O.B and Economics), and *Learning the correct or effective ways of using the environment* (Geography, Business Studies and Economics). In general, both male and female A'Level students had a superficial knowledge of ESD. While some of them equated it with environmental management (Ketlhoilwe, 2007), others were totally ignorant of the concept. They seemed to rely on common sense rather than concrete knowledge derived from class room lessons. This is in spite of the country's EE policy, which states that EE should be infused in existing subjects in secondary schools (GoZ, 2003). Since the policy was promulgated a decade ago, the government is taking too long to implement it, a reflection of the lack of political will at national level (Lopes, 1996).

A' level students both male and female, defined SD as: *Development which does not compromise our future in the environment* (Biology, Chemistry and Mathematics), *Successful development* (Geography, Economics, Management of Business), *Using resources wisely and keeping them for the future* (Geography, History and Divinity), *Wise use of natural resources* (Geography, History and English Literature), *Use of resources in a good manner* (Geography, History and English), *Research on ways of good management* (Geography, Economics and Business Studies), *How to use the environment in an effective manner* (Geography, Economics and Business Studies.), *I don't know/No idea* (History, Divinity and Shona), *Good use of the environment* (Geography, Economics and Management of Business), *Ways of controlling the environment* (Geography, Economics Business Studies)*, Management of the environment*, *Proper development of the environment* (Geography, Accounts and Business Studies), *The land use to sustain for the future generation which they can use for living* (Geography, Divinity and English Literature), *Ways of conserving the*

environment (Geography, Divinity and English)*,* and *Easy development* (Geography, Accounts and Business Studies)*.*

An analysis of the above responses/definitions shows that most of them are either entirely wrong or only partially correct. In general, A' level students are no better than their O'Level colleagues in their understanding of SD issues. The need for rigorous inter-disciplinary training on these issues is obvious (SADC REEP, 2012) while Government should demonstrate more commitment to this issue than it has done in the past (Mapira, 2012a). Failure to do so implies that no change in people's attitudes to the environment can be expected in the near future. Question 9 asked students to list subjects in which EE was included. Their responses were presented in tabular form (Table 6.9). Geography, Science, Agriculture, and Biology occupy the top four positions followed by: Economics, History, Business Studies, Mathematics, Divinity, and Food and Nutrition, in that order. There are similarities and differences between this table and the previous one (Table 6.6). While Table 6.6 has 12 subjects, Table 6.9 has 10. Both tables are identical in their top 4 subject rankings even though lower rankings are quite different.

In general, at secondary school level, EE concepts are mainly taught in the top four subjects (Geography, Science, Agriculture, and Biology) with limited inclusions in other subjects depending on individual teacher's interests and knowledge. This is due to the fact that subject syllabuses have not yet infused EE in their contents, an issue which is long overdue (Mapira, 2012a). At secondary school level EE is provided through the following organizations, sources and methods: EMA and NGOs such as: Care International, Christian Care and WPMA, urban councils, field workshops and field trips organised by schools, school environmental clubs, through television and the internet, school dramas, quiz, speeches and debates, through textbooks, magazines, posters and pamphlets, lessons delivered by teachers in the class room, and through beauty pageants sponsored by EMA.

Table 6.9: A'level subjects in which EE/ESD concepts had been mentioned during lessons

Subject	No. of respondents	Rank
Geography	641	1
Science	323	2
Agriculture	220	3
Biology	204	4
Economics	101	5
History	86	6
Business Studies	63	7
Mathematics	42	8
Divinity	41	9
Food and Nutrition	40	10

Source: Field data

Problems which have been encountered in the teaching/learning of EE/ESD include: *too much theory at the expense of exposure to practical situations, lack of EE centres throughout the country, general ignorance of people concerning environmental issues, lack of experts on EE/ESD, inadequate teaching materials such as textbooks, television sets and the internet, lack of exposure to real life case studies, too much dependence on teacher's opinions at the expense of students' personal experiences, lack of EE/ESD syllabuses in schools, limited study time due to an overloaded curriculum, lack of funds to run EE/ESD programmes at the school level, apathy on environmental issues among students, teachers and members of the public, and general lack of government commitment on EE/ESD issues*. Ketlhoilwe's (2007) study has identified similar challenges in Botswana.

Solutions suggested for these problems included: *provision of textbooks and other forms of literature on EE/ESD issues, establishment of EE centres throughout the country, training teachers who can teach EE/ESD in schools, establishing more environmental*

clubs in both schools and communities, exposure of students to the real world through field excursions, holding more environmental awareness campaigns at both school and community levels, introducing more radio and television programmes broadcasts on EE/ESD issues, seeking for financial donations from the private sector, holding more workshops on EE/ESD issues, opening more internet facilities at both school and community levels, infusing EE/ESD topics especially in O'Level subject syllabuses, using local case studies in the teaching of EE/ESD, and involving communities in conservation projects such as: paddocking, a forestation and re-grassing. Most of these solutions are relevant to other SADC countries as recent studies have shown (SADC REEP, 2012).

On how to improve EE in schools, the following suggestions were made: *establishing EE clubs in schools, involving students in EE awareness activities such as anti-litter campaigns, incorporating EE in subject syllabuses, time tabling EE lessons, organizing debates, drama and quiz contests on EE, inviting EE experts to teach or lecture to students, holding fund raising activities for EE at school level, increasing school fees in order to fund EE projects, buying textbooks and other forms of EE literature, training teachers on EE in each subject, building EE laboratories in schools, providing free internet facilities at school level, holding EE workshops at school level, incorporating EE on the school time table and making it compulsory, providing adequate resources for EE, conducting field trips for EE, EE should stand as a subject on its own which is examinable so that teachers and students can take it seriously, soliciting for funds from potential donors, conducting EE anti-litter campaigns at community level, and stiffening penalties on environmental law breakers*. Most of these solutions have been mentioned by other researchers (G.o.Z, 2009 and Mapira, 2012a). However, experience shows that punitive approaches (such as fines and incarceration) should be avoided and applied only as a last resort as they have proved to be ineffective in the past (Chandiwana, 1996).

Question 14 asked students whether EE programmes in their areas were oriented to the achievement of SD. Some 802 agreed, 138 disagreed and the rest (60) expressed ignorance. Those who agreed gave the following reasons: *government departments such as EMA address EE issues, people are discouraged from cutting down trees and burning*

grass, the poaching of wildlife resources such as wood fuel and timber is illegal, EMA holds EE campaigns in many schools and communities, in some subjects EE concepts are being taught, EE encourages environmental protection, they teach people on SD issues and how to utilise resources for the benefit of present and future generations, EE helps people to use their resources wisely, environmental hazards like pollution are reduced, and EE promotes sustainable ways of using the environment. None of these responses mentions behaviour change, environmental stewardship and the development of an environmental ethic, necessary elements of EE (Fien, 1993). Any E programme which does not incorporate these elements is not likely to achieve its goals at local and national levels.

Those who disagreed also cited several reasons, including that: *people continue to cut down trees for timber and wood fuel, overgrazing is rampant in some areas, people continue to practise stream bank cultivation, some mould and burn bricks along river banks, veldt fires have not stopped, EMA is not visible in most areas, people lack information on SD, EE is not taught in some subjects, since people have not been taught on EE there is no change of behaviour, and the general public is apathetic on EE issues.* Most of these reasons are in line with some of the recent research findings in Zimbabwe (G.o.Z, 2009). For example, in spite of the country's numerous awareness campaigns through formal, informal and non-formal EE providers, little has been achieved on the ground as environmental problems continue to increase (Mapira, 2012a).

Suggested solutions for the above problems included: *applying stiffer penalties for offenders of environmental laws, providing more funding for environmental agents such as EMA in order to make them effective in their operations, increasing salaries for EE staff in order to motivate them in their work, staff developing teachers on EE, establishing EE centres throughout the country, providing literature such as textbooks on EE, seeking more government and NGO support on EE projects, increasing public knowledge on EE through awareness campaigns, involving communities in land reclamation activities such as: erosion and gully control projects, enforcing de-stocking, a forestation and other conservation measures, and encouraging paddocking to reduce*

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over-grazing, fencing stream banks to reduce river siltation and applying stiffer penalties on people who violate environmental laws. However, research has shown that the use of stiff penalties can never yield positive results as people need to be provided with alternative means of survival (Chandiwana, 1996).

6.3 EE in Teacher's Colleges

Attempts by students in primary school teacher's training colleges to define EE yielded the following quoted responses: *EE is the study of ecosystems in relation to man, Education to do with how man relates with the natural world and how that affects him and the environment, Learning which is centred on environmental issues, It is the study of the environment, Education that has to do with how man relates to the natural world, EE is a science discipline meant to create awareness of environmental issues, No idea, Education concerning the physical and social environment, Learning about environmental issues,* and *Education about how man interacts with his environment.*

Most college students had problems in defining EE. While some erroneously regarded it as the study of ecosystems, others thought that it had to do with how human beings relate to the biophysical (natural) world. Some had no idea at all while others viewed it as a discipline which is aimed at creating environmental awareness. Most students failed to link EE with the SD concept, which is an integral component of the definition. This is not surprising given the fact that Environmental Science (ES), which they study lays emphasis on scientific facts about the environment rather than EE (Chikunda, 2007).

Student teachers also had problems with the ESD concept as the following excerpts show: *Utilisation of natural resources for development, Education centred on the protection of the environment, It is the study of the environment and how its natural resources are utilised, ESD is awareness of the importance of the environment to the uplifting of human life, It has to do with careful use of natural resources, I don't know, It is how to use environmental resources sustainably, Using the environment in a way that does not disturb it, How to manage resources well,* and *It has to do with the careful use of natural resources.* It is pertinent to note that some students equate ESD with

environmental management, indicating ignorance of the meaning of the concept (Ketlhoilwe, 2007). There is a need for some rigorous training on the concept if these students are expected to teach it in schools (Ketlhoilwe and Maila, 2008).

With a few exceptions, students seemed to have a better understanding of the SD concept than that of ESD as shown by the following quotations: *Wise use of resources sparingly with tomorrow in mind, Proper conservation/utilisation of natural resources for current development and future use, Use of resources so that the next generation will also benefit, A balance of the use of resources and ecosystem by man, Using natural resources sustain-ably, No idea, Development that does not disturb the environment, Using resources sparingly, and The use of resources sparingly with tomorrow in mind so that the next generations can also use them.* Their better understanding of the SD concept can be attributed to Environmental Science, a subject, which is offered at all primary teacher's colleges. The few who failed to define the term probably reflect their personal weaknesses as students rather than that of the college system. The main methods in the teaching of EE at colleges include: *lectures, drama, poetry and music, discussions, debates and quiz contests, workshops and seminars, EMA's beauty pageants, participation in clean-up campaigns, group project methods, problem-solving approaches, case studies, and field trips*.

However, the predominance of teacher-centred over pupil-centred approaches is a cause for concern as some studies have shown (Chikunda, 2007). Trans-missive pedagogies are not likely to produce individuals who can transform their communities as they lack problem-solving skills (Ketlhoilwe and Maila, 2008). Problems encountered in the learning of EE/ESD in primary teacher's colleges according to information derived from the field include: *the lack of resource persons or experts on EE/ESD, inadequate reference materials or textbooks providing a Zimbabwean perspective on EE/ESD, ES does not teach EE/ESD concepts, inadequate funds for running EE programmes, lack of time for the subject on the college time table, inadequate resources for teaching such as laboratories and equipment, lack of up to date information on EE issues, inadequate media coverage of EE issues, lack of funds for field trips, scarcity of literature on EE in*

the form of text books, pamphlets and information brochures, lack of access to the internet, inadequate teaching and learning aids, lack of instructional guides for teachers, communication barriers due to the use of English (a second language) *as a medium of instruction in schools, and un-cooperative attitudes of local communities towards environmental issues.*

Solutions suggested for the above problems included: *EE/ESD should be time tabled, in-service workshops should be conducted in order to educate student teachers on EE issues, adequate resources and literature on EE/ESD should be provided in each college, regular seminars should be held to update students on current EE/ESD issues, EMA should be well staffed and well funded so that it can deliver EE/ESD to the public, provision of textbooks and other forms of literature, intensifying the appreciation of EE/ESD through awareness campaigns that target colleges and their surrounding communities, conducting field trips aimed at enlightening students on EE/ESD issues in the country, provision of computers in order to improve students' access to information sources such as the internet, establishment of resource centres for EE/ESD, sponsoring EE/ESD field trips by donors, producing instructional materials for EE/ESD teachers, training and disseminating experts or resource persons who can train college students on EE/ESD issues, and furnishing the library with relevant and up to date text books on EE/ESD in the country.* Most of these solutions have been recommended in other poverty-stricken SADC countries (Mukute, et.al, 2012).

On whether EE programmes in Zimbabwe were oriented to the achievement of SD 40 agreed while 60 disagreed. Those who agreed gave the following reasons: *EE awareness workshops are being conducted, theoretical information given to people on EE promotes SD, traditional leaders are enforcing environmental laws, penalties meted out to transgressors of environmental laws are deterrent to potential offenders, and information provided by institutions enables students to conserve the environment and to use natural resources for SD.* These responses reflect a superficial conception of the EE concept as they seem to equate it with environmental management (Ketlhoilwe, 2007). As mentioned previously, EE's main goal is to educate society to a point where it

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changes/transforms people's attitudes, perceptions and lifestyles (Fien, 1993). In the Zimbabwean context, this goal can never be achieved unless there is a re-orientation of the education system in order to make it more socially transformative in nature (Chikunda, 2007).

Those who disagreed also gave their reasons including the fact that: *organisations such as EMA are hardly visible at grass roots level, at the local level no meaningful progress on EE has been achieved, there is no evidence of behaviour change or action for the environment at the grass roots level, government has not demonstrated commitment to EE issues as shown by under-staffing and under-resourcing EMA and other government departments which provide EE to the public, and there are no EE centres in the country.* Obviously there is a need to re-orient EE curricula in Zimbabwe from mere *biophysical and ecological* concerns to broader issues which embrace economic, social aspects, and lifestyle transformation (Chikunda, 2007).

Suggestions of ways of improving EE programmes in the country included: *research should be conducted on how to improve EE programmes in the country, nationwide EE campaigns should be held, workshops on the importance of conserving and using natural resources should be made throughout the country, EMA should be more visible at the grass roots level, government should show more commitment on EE issues through adequate funding of its departments such as EMA, communities should be directly involved in EE campaigns, government should also depoliticise environmental issues by carrying out EIAs in its resettlement programmes, EE experts should be trained and dispatched to various communities, and EE centres should be established throughout the country so as to educate the public on environmental issues.* Most of these solutions have also been recommended for other countries in the SADC region (Mukute, et.al, 2012).

Lecturers in primary school teachers' training colleges attempted definitions of EE as the following quotations show: *EE has to do with the natural surroundings of a given area, This is education that equips learners with knowledge of their environment, Teaching children to maintain their environment using scientific principles, Educating people to*

live in harmony with nature, Disseminating knowledge about how to look after the environment, Acquiring knowledge or information about the environment, Education on environmental issues of concern, Awareness of the importance of your own environment, and Education about the environment. A sound definition of EE should include: environmental sensitivity, a caring attitude and a change in the lifestyle of citizens (Palmer, 1998). Some lecturers have not fully grasped the concept of EE as shown by their responses. This is probably due to the fact that EE is not part of the main college curriculum. Although EE clubs exist in these colleges, their impact on both lecturers and students is questionable. There is obviously a need to embark on the training of these people if the goals of EE are to be achieved (Ketlhoilwe and Maila, 2008).

Lecturers also defined SD in the following ways: *SD involves the production of resources, which can equate the needs of a given population, Wise use of the environment for the present generation and its preservation for future generations, Progress with minimum negative consequences on the environment, Using resources sustain-ably for the benefit of future generations, Proper utilisation of the environment considering future generations, Projects done to conserve the environment for example EMA, and Using resources sparingly for future use.* The correct definition should include ecological, economic and social aspects as well as present and future generations (WCED, 1991). Again, with some exceptions, college lecturers have a better understanding of SD than EE. This is probably due to the abundance of literature on SD compared to that of its counterpart. Furthermore, since the late 1980s, SD has become a household term at global level.

Attempts to define ESD yielded the following excerpts from college lecturers: *Teaching communities how to use the available resources, Equipping people with the knowledge of using the environment with the focus of future generations, Acquiring environmental knowledge for better management of resources so that future generations will also benefit, Having knowledge about how to manage the environmental resources for the benefit of future generations, Educating communities about the environment, and Development of a nation through environmental education.* Most of these definitions

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sound like those of SD, an indication that most lecturers are not well informed on ESD and therefore need staff development workshops in order to improve their knowledge on the issue (Ketlhoilwe, 2007).

On whether EE programmes in Zimbabwe are oriented to the achievement of SD, 80 agreed while 20 disagreed. Those who agreed listed the following reasons: *environmental awareness discourages environmental damage thereby promoting SD, EE programmes teach people to conserve their environments, people learn to sustain-ably manage their environment, they guide people on core values of the environment, they emphasize on how the environment should be used, workshops, clubs and awareness campaigns promote natural resource conservation for present and future use, people are being educated about the environment and how to manage it, and communities are trained to prevent veldt fires, conserve soil and forests and to adopt proper sanitation through waste disposal methods*. Those who disagreed did not give any reasons. They left blank spaces on the questionnaire. It is not clear why they could not provide reasons. However, sheer ignorance of SD and EE issues is a possible reason as some researches have shown (Ketlhoilwe, 2007).

Question 9 asked respondents whether EE/ESD was included in their subjects or courses. A total of 90 agreed while 10 disagreed. On whether these concepts were adequately taught, 70 agreed while 30 disagreed. Suggestions given by those who disagreed included that: *objectives of EE/ESD should be clearly spelt out in syllabuses, topics should be listed and the content should be included in one subject area, provide adequate teaching resources such as literature, training EE/ESD teachers through staff development courses, and funding should be provided for field trips*. Existing ESD literature echoes similar sentiments (Lotz-Sisitka, 2005). Just as in other SADC countries, there is a scarcity of resources, teaching materials and EE centres. South Africa is the only country with sufficient resources for its ESD programme (Palmer, 1998). However, its dependency on fossil fuels and its reluctance to abide by the Kyoto Protocol are a major hurdle as mentioned previously.

In response to question 12, respondents listed problems, which they had encountered in the teaching of EE/ESD in their subjects or courses. They included: *lack of teaching materials such as text books and teaching aids, scarcity of EE/ESD experts to train teachers, lack of information on EE/ESD concepts, limitations of the curriculum, which does not adequately include EE/ESD issues, teachers have not yet been trained to teach EE/ESD leading to ignorance, lack of funds for field trips, it is only included in Environmental Science hence it is not taught in other subjects, paucity of resources such as text books and atlases, EE/ESD content is too broad to be covered in Environmental Science, lack of science kits to be used in teaching EE/ESD, packed time tables which cannot accommodate EE/ESD, lack of laboratories for teaching purposes,* and *rampant destruction of the environment by people who seek to survive.* This reflects poor people's attempts to eke out a living directly from the environment, which is a major cause of environmental degradation in communal areas, an issue that has been raised by some researchers (Chandiwana, 1996). Teaching ESD in the context of such practices is not likely to yield positive results within the school and community as existing literature shows (Shumba, et.al, 2008).

Suggested solutions for the above problems included: *EE/ESD should stand as a separate subject just like Mathematics and English, funds should be sourced for the purchase of teaching materials such as text books, the school time table should be de-congested in order to accommodate EE/ESD, EE/ESD should be infused into Environmental Science or Social Studies, workshops should be conducted with the aim of training teachers to teach EE/ESD, EMA should intensify its EE/ESD awareness campaigns throughout the country, and resources should be provided in the teaching of EE/ESD.* Some of these solutions have been suggested by Chikunda (2007) as mentioned previously. At Mutare Teacher's College (just as at Belvedere and Hillside), EE/ESD is taught in environmental clubs, which are not compulsory. As a result, most students are not exposed to it. Although Geography and Science lecturers occasionally mention EE/ESD during their lectures, there is no depth in their coverage.

Lecturers at the college (Annexure 3) defined EE as: *teaching students on/about our surroundings: economic, political, physical and social, education that is environment centred, measures to conserve the environment, awareness of our surroundings, impartation of knowledge about the environment, education concerned with the environment, learning about how to manage our surroundings, it is a study about man and his environment, EE seeks to develop an understanding of environmental issues in order to produce positive attitudes towards the environment, learning about the surroundings, it refers to organised efforts to teach about how natural environments function, the study of nature and what is in it, getting knowledge of the natural surroundings, giving students knowledge of the environment or their surroundings, an awareness of the environment and how it should be managed* and *used for the benefit of Creation, and teaching and learning of the environment.* These responses indicate that most lecturers view EE as conservation education, environmental science or environmental management. Hence the need for the staff development of these lecturers is obvious as Ketlhoilwe's (2007 on Botswana suggests.

They went on to define SD in various ways including: *conservation of natural resources to improve the well being of present and future generations, exploitation of resources to raise standards of living of people without damaging the environmental resource base in order to enable future generations to enjoy the same resources, development that is meant to sustain one's life, good use and management of resources for economic development, development that has long lasting benefits, these are activities done by people in their community so as to support their way of life, maximum utilisation of available resources, the wise use of the environment, development which is not stagnant,* and *a pattern of resource use that seeks to meet human needs while preserving the environment.* Although some of the above definitions are either erroneous or superficial, others such as the first two are quite sound and capture the true essence of the concept.

The following definitions were provided for ESD: *education on the environment to enlighten people about the proper use and development strategies, it refers to education for the environment to improve the future, educating people about how to use their*

environment in a way which promotes development, I don't know/No idea, environmental awareness aimed at meeting set development goals, education that enables students to improve their surroundings, teaching children about the wise use of the environment, use of the resources in a particular area in order to satisfy the needs of the people, education that deals with the maintenance of the environment, this is education that is geared to economic development and wise use and management of the environment, development of my institution, education focusing on the environment and its resources, and *this is education which develops the needs of the present generation without endangering the future.* It is pertinent to note that some lecturers failed to define the term, indicating the need for staff development workshops on ESD (Ketlhoilwe, 2007). While some viewed ESD as environmental conservation, others equated it with environmental management. A few had no idea and expressed ignorance. Obviously, the existence of an EE club in the college has not helped to improve the situation at all.

On whether EE programmes in the country were oriented to the achievement of SD (Annexure 3 Number 7), 60 agreed, 10 disagreed while 30 had no idea. Those who agreed gave the following reasons: *initiatives are in place to promote knowledge of SD, environmentally friendly programmes are underway to promote SD such as forestry, agriculture and mining, curricula will include EE in future, there are plans to establish EE centres throughout the country, EMA frequently holds environmental awareness campaigns to educate the public on environmental issues, ordinary citizens are taught to re-cycle their waste so as to protect the environment, communities are also taught how to conserve their soils, forests, wildlife and water resources, workshops are being organized on EE programmes, people are being educated on how to take care of their environment,* and *traditional leaders are also involved in promoting natural resource conservation.*

Existing literature, however, shows that Zimbabwe's EE/ESD programme (in schools) is not geared towards the achievement of its SD goals. Chikunda (2007, 158) for example, has noted several challenges such as the fact that '*BEST advocates for a kind of education that has attributes for education for sustainable development. However, the practical implementation of BEST does not appear to match these intentions. Teachers, and their*

supervisors, are still tied to neoclassical methodologies in which teachers know and pupils don't. The…curriculum prohibits the required re-orientation of education towards an education system that provides communities with skills, perspectives, values and knowledge to live in a sustainable manner. Communities themselves appear to find it difficult to conceptualise their role in the schooling of children in a community context'.

However, these problems are not peculiar to Zimbabwe as they have been noted elsewhere in the SADC region (Ketlhoilwe, 2007). For example, to date, Botswana is still grappling with its EE/ESD policy implementation problems (Mukute, et.al, 2012). In the light of the current challenges, Chikunda (2007, 158) calls for a re-orientation of educational philosophy in Zimbabwe, as well as for closer relationships between schools and communities in the learning process'. Those who disagreed noted the fundamental weaknesses of the country's EE/ESD programme such as: *EE programmes do not cover all areas in the country, there is little or no change of behaviour among most people, EMA is under-funded and this reduces its effectiveness at the grass roots level, and in schools and colleges EE is not prioritised as it is neither time-tabled nor examined. Rather, it is relegated to environmental clubs, which are extra-curriculum activities.* These observations reflect the plight of Zimbabwe's EE/ESD programme as existing literature shows (Chikunda, 2007; Mapira, 2012a and Mukute,et.al,2012).

Suggestions given for the improvement of EE/ESD in the country are also in line with recent research-based recommendations (Chikunda, 2007). They included the fact that: *the CDU should review syllabi at national level with the aim of incorporating EE/ESD in their schools curricula, provision of staff development courses at school and college levels, inclusion of EE/ESD in both the school and college curriculum, EE/ESD topics should be infused into syllabuses such as those of Geography, Science and Agriculture, EE/ESD should stand as a separate subject that is compulsory especially at secondary school level, the new subject should be time tabled and examinable at national level, at community level, EE/ESD campaigns should be held in order to educate the public on environmental issues, literature in the form of text books, posters and pamphlets should be disseminated to the public, more research should be conducted on EE/ESD and be*

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made available to ordinary citizens, and *government should show commitment through the provision of more funding to organizations, which disseminate EE/ESD such as EMA.*

College lecturers mentioned the following problems, which they encountered in the teaching of EE/ESD: *inadequate funding of the EE/ESD activities such as field trips, lack of relevant literature such as text books and EE/ESD laboratories, poor back ground of students on EE/ESD issues, lack of access to the internet and other teaching resources, since EE/ESD is time consuming, it can not be adequately covered by current syllabuses, scarcity of EE/ESD experts or teachers at both school and college levels, lack of EE/ESD programmes that are community based, the lack of electricity in rural areas, which forces people to cut down trees for wood fuel thereby damaging the environment, most lecturers lack information or training on the teaching of EE/ESD, the environment is not conducive to the teaching of EE/ESD concepts since students are exposed to activities which degrade it such as: gold panning, over-grazing, deforestation and wildlife poaching with little or no action being taken against offenders,* and *lack of space for EE/ESD on the school or college time table apart from club activity, which is not compulsory.* Again, most of these challenges are also prevalent in other poverty-stricken SADC countries (Lotz-Sisitka, 2005).

Suggested solutions for these problems included: *the Government should set an example by prioritising environmental issues even in its annual budget allocations, training resource persons who can conduct staff development workshops in schools and colleges, syllabuses should be changed or revised at primary, secondary and college levels in order to incorporate EE/ESD themes, work shops should be conducted in order to spread EE/ESD information in academic institutions and in communities, providing adequate and relevant literature on EE/ESD backed by local case studies and examples, making use of alternative sources of information such as the internet, establishing EE centres throughout the country, EE/ESD laboratories should be established in schools and colleges while libraries should be stocked with relevant text books and other forms of literature, the school and college curricula should be reviewed in order to incorporate EE/ESD issues, a levy should be introduced so as to finance the teaching of EE/ESD in*

schools and colleges, and *rural electrification should be intensified in order to reduce deforestation, which is caused by wood fuel demand.* Most of these solutions revolve around policy implementation challenges, political will/commitment and resource constraints which have been mentioned previously (Nkala, 1996). Hence they should be addressed as soon as possible if EE/ESD goals are to be achieved.

6.4 EE in Agricultural Colleges

Recently, Zimbabwe has introduced EE in all its agricultural training colleges (Mukute, et.al, 2012). The pioneering stages of the project commenced in September, 2008 and ended in August 2011 being coordinated by the Institute of Environmental Studies (IES), University of Zimbabwe. The aim of the project was to '*mainstream sustainable natural resources management in professional agricultural education through the development and incorporation of environmental education into the curricula of higher national agricultural diploma programmes. The rationale is that the agricultural diploma curriculum was very weak on environmental education and yet the graduates are largely employed as agricultural extension officers and have a significantly larger presence in rural communities compared to trained environmental officers. The project is developing the curriculum for environmental education; training college lecturers in implementing the curriculum; establishing environmental management information facilities at the colleges and facilitating the implementation of the teaching of the new courses at the colleges. The project will contribute to environmental sustainability through the education on environmental management given to the farmers by the agricultural college graduates*' (IES, 2011:1).

Colleges which were involved during the pioneering stages of the project included: Chibhero, Esigodini, Gwebi, Mlezu and Rio Tinto. This researcher did not conduct surveys in these colleges since EE/ESD had not yet been fully integrated in the curricula during the fieldwork period. However, a survey which was conducted by IES showed that students appreciated the new courses (IES, 2011). Some of Zimbabwe's manpower needs to date include: sustainable land managers, foresters, wetland managers, environmental law enforcers, and climate change specialists (Mukute, et.al, 2012). The project was

funded by the UK,s Department for International Development DfID) under the Development Partnerships in Higher Education Programme (DelPHE).

The aim of the programme is to provide financial support to Higher Education Institutions which are engaged in activities linked to the UN Millennium Development Goals (IES, 2011). The inclusion of EE in agricultural colleges is an important development as it signifies the country's drive towards ESD. Since graduates from these colleges will be deployed in various parts of the country, they will play an important role in the dissemination of EE/ESD information at national level. In 2010 for example, two courses were introduced, taught and examined in all colleges of agriculture, namely: Environmental Management and Reclamation of Degraded Landscapes. Although it is too early to pass a judgment on its effectiveness, the inclusion of EE is a remarkable development in the history of agricultural colleges in Zimbabwe.

6.5 EE in Universities

EE/ESD degree programmes offered by universities are expected to equip students with skills which are necessary for social transformation (Fien, 1993). These programmes should focus on the local context without ignoring the external contexts (national, regional and global) which influence them (Ketlhoilwe, 2007). Graduates from such universities should be capable of addressing the various challenges which confront their communities. According to Ketlhoilwe and Maila (2008, 132), '*A relevant and quality university programme is one that would enable university scholars to examine the economic, social, political and environmental contexts in which the programme operates to ensure that graduates are equipped to address real needs and that their research is relevant and useable*'. This implies that graduates from such institutions should not only have a sound theoretical foundation (in-depth knowledge) of EE/ESD but also be equipped with problem-solving skills. Furthermore, they should be oriented towards social transformation (Chikunda, 2007).

The above information can guide researchers in determining the effectiveness of Zimbabwean universities in executing their EE/ESD mandate. Information derived from

the field shows that just as in schools and colleges, both lecturers and students had problems in defining concepts such as EE and ESD. This raises questions about their mastery of these concepts. This can be attributed to several problems. In the teaching of EE/ESD within the BA/BSc programmes at Great Zimbabwe University, several challenges have been encountered. For example, as optional courses, not all Geography and Environmental Science students take it resulting in only a few who choose to do it, it is taught in only one semester. Hence not much depth and detail can be expected due to limited time.

The lack of EE/ESD experts also negatively affects the quality of teaching/learning done while the lack of literature on the courses undermines the quality of graduates produced. Inadequate resources such as: the lack of laboratories, poorly stocked libraries, inadequate funding, lack of field trips and limited access to the internet also have a negative effect on the EE/ESD quality to be delivered. Most of these problems have also been reported in other SADC countries as Ketlhoilwe's (2007) study (in Botswana) shows. In the Faculty of Education, the following problems were mentioned: *Environmental Science, which is taught does not cover much ground on EE/ESD concepts, inadequate teaching resources for EE/ESD, lack of EE/ESD experts, inadequate time to teach EE/ESD since it is not taught as a separate course, differences between EE/ESD and Environmental Management are not made clear, and some lecturers find it difficult to incorporate EE/ESD in topics like map work and data presentation methods*.

These challenges have also been noted elsewhere in the SADC region (Mukute, et.al, 2012). Solutions suggested for these problems included: *developing teaching modules and text books for EE/ESD* (SADC REEP, 2012). The current Zimbabwe Open University (ZOU) module is rather superficial and lacks Zimbabwean case studies on EE/ESD. Other solutions included: infusing EE/ESD in the existing courses in both Geography and Environmental Science, intensifying well funded researches and publications on EE/ESD in the country so as to build a solid data bank for students and lecturers, developing resource units in some university departments in order to promote

research and publications on EE/ESD, and establishing EE centres throughout the country so that ordinary citizens can benefit from them. At the University of Zimbabwe (UZ), the Institute of Environmental Studies (IES) plays a key role at both institutional and national levels (Mukute, et.al, 2012a). However, the lack of such units in other universities is a set back, which needs to be addressed.

6.6 Challenges facing the EE programme in the formal education sector

Several observations have emerged from the findings. Firstly, the formal education sector including schools, colleges and universities, is the main provider of EE in Zimbabwe contributing nearly 84% of the total. For this reason its impact is more strongly felt throughout the country than that of non-formal and informal providers, which account for only 16% of the EE provided at national level. Since the country has the highest literacy rate on the African continent (CSO, 2012), most people receive some EE during their school days. However, the type of EE provided is **biophysical or scientific** in nature and is not likely to inculcate values of environmental stewardship as existing literature shows (Fien, 1993). Secondly, the failure of some teachers and students to define basic concepts such as EE, SD and ESD reflects the lack of depth on these issues (Ketlhoilwe and Maila, 2008).

Most teachers have not received adequate training on EE/ESD issues (Chikunda, 2007). Hence they lack the necessary skills for handling the subject. For this reason there is a need for staff development programmes to educate teachers on EE/ESD issues (Ketlholwe, 2007). The same applies to college and university lecturers who have not received any such training according to the findings of this study. Thirdly, school, college and university curricula also need to be re-oriented so as to incorporate EE themes (Chikunda, 2007). Fourthly, a major constraint, which confronts the education sector, is the lack of resources such as libraries, laboratories, equipment and literature. This problem has also been reported in Kenya, and Uganda as well as most SADC countries (Palmer, 1998). In Zimbabwe, poverty is a major problem, which militates against the successful implementation of EE programmes as Shumba, et. al's (2008) study has shown.

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The lack of EE centres has compounded the problem since there are no sources of information in most parts of the country. In South Africa, EE centres have been established in various provinces so as to provide information to schools and their surrounding communities (Palmer, 1998). Obviously, if such centres were to be established in Zimbabwe, they would benefit many schools, colleges, universities and some communities. In conclusion, solutions are urgently needed to address all the above problems. Another problem which confronts EE/ESD in Zimbabwe is its failure to address *local environmental challenges,* which is the litmus test of a relevant and quality education as some researchers have shown (Ketlhoilwe and Maila, 2008). That is why veldt fires, deforestation, pollution, and land degradation have been on the increase in spite of numerous EE/ESD awareness campaigns at both local and national levels (G.o.Z, 2009). However, this is not surprising as the type of education provided is not geared at transforming people's lifestyles (Chikunda, 2007). Policy makers are equally to blame as they fail to set a good example to ordinary citizens as this study has shown.

6.7 Summary

This chapter has provided a detailed discussion of the role of the formal education sector in the provision of EE/ESD in Zimbabwe. As mentioned previously, schools, colleges and universities, together contribute nearly 84% of the EE that is delivered in the country compared with only 16% which is provided by the informal and non-formal education sector. In primary schools environmental issues are taught in the form of Environmental Science while at secondary level, there are plans to infuse them in subjects like Geography, Science and Agriculture. In both cases little or no EE/ESD is taught since it has not yet been included in syllabuses. In teacher's colleges, issues of the environment are taught either as Environmental Science or as part of Geography, Agriculture or Science. Agricultural colleges have just introduced EE/ESD in their curricula and time will tell how they will perform in the long term.

At university level EE/ESD has been infused in Geography and Environmental Science even though not much ground is covered due to an overloaded curriculum. However, this

problem has been reported in other African countries including those in the SADC region (SADC REEP Report, 2008). The main problems confronting primary schools include: lack of literature (especially text books and other teaching materials), lack of EE centres in the country, inadequate funds for field trips, lack of EE experts, government's lack of commitment and the general apathy of communities on environmental issues. In secondary schools similar problems are experienced including that of time for EE/ESD due to an over-loaded curriculum. In general EE/ESD has not yet been infused into existing subjects (Chikunda, 2007). In teacher's colleges it does not stand as a subject on its own even though there are EE clubs, which students can join if they like.

In some universities such as GZU and ZOU, EE is taught as a semester course. Furthermore, its optional status implies that some students may not take it at all. The result is that they go through their under-graduate programmes without being exposed to the course hence their knowledge of EE/ESD is undermined. This scenario is not likely to instil environmental sensitivity among students and their lecturers. Since the goal of EE programmes is to change people's attitudes and lifestyles, the present situation is not likely to yield positive results (Chikunda, 2007). Several solutions have been suggested for these problems including: revising the whole curriculum with a view to incorporating it, providing funds for EE/ESD and making it a compulsory and examinable subject or course especially at secondary, college and university levels. The next chapter discusses the implications of Zimbabwe's EE programme for SD at both local and national levels.

CHAPTER SEVEN: IMPLICATIONS FOR SD

7.0 Introduction

This chapter examines Zimbabwe's EE programme in the light of the main goals (research questions, objectives and conceptual framework) which were presented previously in this study. References are made to the main findings which emerged from this study as well as the environmental and EE policies of the country. Since Zimbabwe is a part of the SADC REEP programme, it is essential to examine its progress in achieving UNDESD goals that were set out at the sub-regional level. Zimbabwe's environmental policy was promulgated in 2005 with the goal of avoiding '*irreversible environmental damage maintain essential environmental processes, and reduce pressure on the broad spectrum of biological diversity so as to sustain the long-term ability of biological diversity so as to sustain the long-term ability of natural resources to meet the basic needs of people, enhance food security, reduce poverty, and improve the standard of living of Zimbabweans through long-term economic growth and creation of employment. This goal places the environment at the centre of efforts to create economic opportunities for people in Zimbabwe, thereby helping to reduce poverty and improve their quality of life*' (G.o.Z, 2009:2).

On the other hand, the country's EE policy seeks to '*make sustainable development a national priority, to take a pro-active role in environmental issues and to respond to environmental challenges facing Zimbabwe at the personal, national, regional, and global levels through education and communication processes*' (G.o.Z, 3:3). The policy document defines EE as '*the raising of public awareness, the sharing of knowledge and experience must be promoted for the purpose of increasing the capacity of communities to address environmental issues and of engendering in people values, skills and behaviour consistent with natural resource management for sustainable development*' (G.o.Z, 2003:4). It is pertinent to note that both the environmental and EE policies have a common goal, namely: the achievement of SD at local and national levels.

Zimbabwe, like other developing countries, is experiencing an environmental crisis which calls for urgent solutions (Otiende, 1997). Some of the problems experienced include: overgrazing, deforestation, biodiversity loss, the poaching of wildlife resources, air, water, and soil pollution (Lopes, 1996). At global level, most scientists believe that a '*great change in the stewardship of the Earth, and the life on it, is required if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated…whether industrialised or not, we all have but one lifeboat. No nation can escape injury when global biological systems are damaged*' (Miller, 1996:9). Consequently, they advocate for the development of a new ethic and new lifestyles which are geared at environmental protection and achieving SD at local, national and global levels (WCED, 1991). One way of achieving this goal is through the dissemination of EE/ESD among ordinary citizens (Fien, 1993).

Following the Rio Earth Summit of 1992, Zimbabwe has made remarkable strides in its quest for SD through the provision of EE to the public. A major development was the promulgation of the Environmental Management Act (Chapter 20: 27) of 2002, which is now responsible for environmental management at national level (GoZ, 2009). Other notable achievements include: the establishment of an environmental management agency (EMA) that is responsible for environmental monitoring and protection (Gandiwa, 2005), the promulgation of an EE policy document in 2003 (G.o.Z, 2003), the partnership of EMA with other providers of EE in the country such as: the FC, urban councils, traditional leaders and NGOs, and collaboration of Zimbabwe with international organisations, which promote SD including: UNCED, UNEP, UNESCO, UNDESD, and SADC REEP (Lotz-Sisitka, 2005).

According to Molapo (1999), some of the problems which SADC countries face in their EE programmes include: the lack of personnel (educators) who are trained to teach EE, inadequate funds and capacity, poverty and hunger, lack of cooperation between some government departments and NGOs, which provide EE. As this study has shown, Zimbabwe experiences all these challenges. SADC, as a region, has been trying to address these challenges since the beginning of the new millennium. The strategies,

which the region has adopted, according to the SADC EE/ESD Report (2008), include: re-orienting education and training systems towards SD, broadening the participation of society in addressing SD issues and challenges, institutionalising SD into education systems, harmonising government departments and NGOs, which provide EE, and increasing EE/ESD campaigns at local and national levels. In Zimbabwe, the development of an EE policy has been aimed at achieving some of the national goals (G.o.Z, 2003). However, a major constraint, just as in other SADC countries, is the lack of funds to implement the policy (G.o.Z, 2009).

Another problem is the gap between the policy and its suitability or implementa-bility on the ground (Chikunda, 2007). For example, it is doubtful whether Zimbabwe has the financial capacity to establish and run EE centres throughout the country given the country's budgetary constraints (Mapira, 2012a). South Africa, SADC's economic giant, has established such centres in various parts of the country (Palmer, 1998). It is also obvious that some of Zimbabwe's top government officials (including some cabinet ministers) do not take environmental issues seriously as shown by their involvement in poaching syndicates, which smuggle ivory out of the country as this study has shown (*The Standard*, October 20, 2013, pages 1-2). The lack of political will among decision-makers has also been cited as another problem, which the country has been experiencing since independence in 1980. Nkala, (1996: 79) laments that although government '*laws are there to protect the environment...degradation has worsened*'. This is because ordinary people in communal areas (due to poverty) lack alternative solutions in order to meet their needs without degrading their environment.

An examination of the activities of various organisations, which provide EE in Zimbabwe yields important information on the issue. It has already been noted that in order for EE programmes to succeed, certain conditions should be met (Palmer, 1998, SADC EE Report, 1999 and Lotz-Sisitka, 2005). The presence or absence of these conditions is an indicator of the effectiveness of the programmes. In this study, these conditions are used as yardsticks of the success or failure of Zimbabwe's EE programme in its drive to attain the goal of SD at local and national levels.

Firstly, there is a need for *Green* political parties or organisations, which lobby for environmental protection (Palmer, 1998). Secondly, governments should have the political will to champion EE issues and must be committed to international agreements on environmental protection (Nkala, 1996). Thirdly, societies should be sensitive to the plight of the environment and be prepared to sacrifice their materialistic goals for the sake of the environment. Although there are no Green political parties in Zimbabwe, several organisations, which lobby for the environment, exist including: EMA, some government ministries and departments, urban councils, and several NGOs. As part of the SADC regional grouping, Zimbabwe has received support from organisations such as REEP, EEASA and REES especially in the form of workshops, literature and conferences (The SADC ESD Report, 2006). The UN through UNESCO and UNESD has also assisted Zimbabwe during the formulation of the country's EE policy (Shava, 2003).

However, most EE providers in Zimbabwe are under-funded, under-staffed and under-resourced due to poverty and lack of commitment at the national level (Mapira, 2012a). Some top government officials are also involved in the poaching of wildlife resources such as elephants and rhinos thereby undermining the development of environmental stewardship among some communities as this study has shown. Consequently, the effectiveness of various organisations in the execution of their mandate is questionable, which paints a bleak future for EE programmes in the country. The government also lacks the necessary political will to take environmental issues seriously (Lopes, 1996). For example, the recently completed land re-distribution programme was never preceded by EIAs even though the latter are mandatory (Chimhowu, et.al, 2010).

Furthermore, although the EE policy document (G.o.Z, 2003), proposes the establishment of EE centres throughout the country, to date none have been set up and there is no evidence that they will be established in the near future. For this reason, it is doubtful whether policy makers are serious in the implementation of their plans or policies. At the grass roots level, problems also emerge as ordinary people display their lack of environmental sensitivity. Due to poverty, they damage the environment and natural

resources through activities such as: gold panning, deforestation, veldt fire outbreaks, and the poaching of wild-life resources including endangered species such as elephants and rhinos. According to a recent news paper article

'*Grinding poverty, un-employment, a lack of economic activity, and community's over-dependence on the Hwange National Park for livelihood have, to a great extent, fuelled the ecological disaster that has seen more than 100 elephants and other animals succumbing to cyanide poisoning, investigators have revealed*'. (*The Sunday Mail*, October 6, 2013. page D4).

Ironically, in some cases, they conduct their illegal activities in collaboration with some top government officials such as cabinet ministers (*The Standard*, October 20, 2013, pages 1-2). In a country which has a well documented EE policy and is a member of the regional UNESD grouping (SADC ESD Report, 2006), this is quite disturbing. In a way, it confirms Le Grange's (2011, 744) fear that ESD risks the '*danger of becoming education for consumerism and unbridled economic growth*' or materialism. Unless there are major improvements in the government's attitude to environmental issues, Zimbabwe is not likely to achieve its MDG goal of environmental sustainability, as existing literature on ESD shows (Lotz-Sisitka, 2005).

7.1 Colonial legacy and Environmental Management

A major weakness of environmental management in Zimbabwe has been the predominance of former colonial practices borrowed from Western or scientific traditions (Lopes, 1996). Such practices tend to marginalise local communities especially in communal areas so that they can not take a leading role in managing their resources. In most cases they are regarded as the main causes of environmental degradation (Chenje and Johnson, 1994). According to Chandiwana and Moyo-Mhlanga (1996, 143) '*The local communities have rarely featured in government/non-governmental organization inspired endeavours. They have rather been seen and considered as part of the problem, degrading their environment by, for example, overstocking, cutting down trees and ploughing down slopes. National land laws and policies have been designed to prohibit*

these practices and government agencies indeed are in abundance in local communities to enforce national laws to protect the environment'.

However, research has shown that the criminalisation of people's survival strategies is an outdated approach which has proved to be ineffective in addressing environmental challenges at local and national levels (Chimhowu, et.al, 2010). Apparently EMA is making the same mistake. Since its inception its major pre-occupations have been punitive in nature, for example meting out fines and penalties for the so-called environmental criminals (G.o.Z, 2009). This has obviously tarnished its image at both local and national levels. That is probably why veldt fires, deforestation, pollution, and land degradation have been on the increase in spite of EMA's numerous environmental awareness campaigns (Mapira, 2012a).

Obviously there is a need to re-orient environmental policy so that it becomes user friendly to people in communal areas. Both EMA, and its partners should embark on strategies, which empower these communities so that that they can effectively solve their environmental problems. EE/ESD offers opportunities for this to happen. An example is that it encourages ordinary people to participate with outsiders in solving their problems. According to Chandiwana and Moyo-Mhlanga (1996, 155) '*It is critical that those who use the natural environment for their survival to also have a say in how in their daily interaction and use of nature is determined for them to actively play a part in its conservation. The laws must take this into account'*.

7.2 Approaches used in Zimbabwe's EE programmes

It has been mentioned that during the colonial era, EE in Zimbabwe was taught in the form of conservation education just as in other African countries (Chikunda, 2007). In primary schools, EE was taught in the form of *Nature Study* just as was the case in Uganda, Kenya and Tanzania (Otiende, 1997). Apart from conservation education, colonisation also brought rigid subject divisions, which have now become a hindrance to the infusion of EE in the school curriculum (Lotz Sisitka, 2005). To date the school

timetables are congested due to an overloaded curriculum. That is why it is proving difficult to accommodate EE in most secondary schools as this study has shown.

In the formal education sector, contrary to SADC REEP goals, the most common approach employed in the teaching of EE is **about** and **through** rather than **for** the environment (Fien, 1993). In schools, syllabi have not yet been changed in order to infuse ESD concepts as this study has shown. Considering the fact that Zimbabwe's EE policy is more than a decade old, the country is taking too long to re-align its education curriculum to regional ESD goals. It is also disturbing to note that as the UNDESD (2005-2014) comes to an end, the country has not yet executed its mandate of implementing ESD in the formal education sector. However, other SADC countries are also lagging behind due to various reasons including poverty, hunger, resource constraints and civil strife (SADC REEP Report, 2008).

In the informal and non-formal sectors, not much has been achieved apart from the establishment of an environmental management agency (EMA). Since its inception in 2007, it has faced problems of under-funding and under-resourcing (Mapira, 2012a). As a result, its impact at the grass roots level is still quite low as this study has shown. Together with the FC, government departments, urban councils and some NGOs, it contributes only 16% of the EE provided to ordinary citizens. This is in sharp contrast with formal education EE providers which account for nearly 84%. This disparity shows that EMA and its partners have a long way to go before they can catch up with their counterparts in the formal education sector (schools, colleges and universities).

Furthermore, unlike South Africa, which has established EE centres in various provinces (SADC REEP Report, 2008), Zimbabwe has not yet established any due to both resource constraints and probably the lack of commitment at the policy implementation stage (Nkala, 1996). Zimbabwean colleges and universities are also lagging behind their South African counterparts in the adoption of ESD approaches due to the same reasons (Mukute, et.al, 2012). If this trend continues, the country is not likely to achieve its

UNDESD goals. However, this is not surprising as most of its SADC neighbours are also facing similar problems due to poverty, hunger, disease and in some cases, civil strife (Molapo, 1999). According to (Lotz Sisitka, 2005: 6),

'*Southern Africa is home to some 291 million people, of which about 25% live in urban areas. The majority (75%) of southern Africans live in rural areas, and a very large proportion of these people are dependent on natural resources for their livelihoods. The natural or biophysical environment is therefore central to development processes in Southern Africa, and its significance should not be under-estimated. Key resources for livelihoods in these rural areas include grazing for animals, fuel wood, water and access to productive land (fertile soil) and healthy ecosystems-all of which are under pressure. The biophysical life-support systems and access to them, are threatened by increasing population levels, coupled with increased poverty and its development sister over consumption (linked to global inequality and inappropriate economic and development frameworks), poor quality of- and poor access to- education and limited livelihood options. Many people live in on-going conditions of risk, which are exacerbated by drought and flooding (linked to climate change), the spread of HIV/AIDS and various threats to peace and security*'.

In Zimbabwe, the promulgation of a comprehensive and detailed EE policy document more than a decade ago has not yet yielded positive results in the implementation of some of the country's goals such as the infusion of ESD concepts in the curriculum and the establishment of EE centres (Mapira, 2012a). Although Botswana did not have a clear EE policy a decade ago (Obol, et.al, 2003), it seemed to be making more progress than Zimbabwe, which had a well documented policy. For example, since 1996, Botswana had been conducting in-service workshops for teachers who taught EE in schools. Other positive developments have included the provision of resources, getting support from education officers, school heads and departments as well as the creation of a conducive environment for teachers (Ketlhoilwe, 2007). In more recent years, the country has also introduced a post-graduate degree in Environmental Education at the University of Botswana (Mukute, et.al, 2012).

However, in spite of the above merits, Botswana is experiencing several challenges, which are quite similar to those which are confronting Zimbabwe's EE programme (Ketlhoilwe, 2007). They include: the lack of information from the CDU, lack of trained teachers, lack of facilities and the negative attitude of some teachers. Mukute, et.al. (2012) claim that to date Botswana is still grappling with EE policy issues. Zimbabwe's EE can also be compared with that of Tanzania. Like Botswana, Tanzania lacks a specific EE policy (Makundi, 2003). However, it has managed to integrate EE into the primary school curriculum (through Social Studies) even though it has not infused it in other subjects. Although teachers have received training on EE, there is little or no impact on learners (Obol, et.al, 2003). In Zimbabwe, a major challenge has been the **rhetoric-reality gap** as Chikunda's (2007) study has shown. This has been ascribed to the neoclassical approaches which were borrowed from the colonial era and the lack of political will among policy makers (Nkala, 1996).

7.3.0 EE providers and the quest for SD in Zimbabwe

The providers of EE, which were examined in this study included: non-formal and informal educators such as: EMA, FC, AGRITEX, PWMA, urban councils and NGOs, and the formal education sector, which comprises schools, colleges and universities (G.o.Z, 2003). Each of them is examined here in the light of the country's quest for SD.

7.3.1 EMA's EE programme and its implications for SD

As mentioned in Chapter Five, EMA has been facing numerous challenges in the provision of EE/ESD at district, provincial and national levels. The challenges have some implications on the achievement of SD at national level. For example, the under-funding of the agency has reduced its capacity to effectively execute its mandate of educating the public on environmental issues (Table 5.7). To date it has only managed to reach 9.7% of the population compared to 32.3%, 22%, and19.3% reached by primary schools, universities and secondary schools, respectively. There is a need to improve its financial capacity and staffing situation, which have been critical since its inception (Chimhowu, et.al, 2010). EMA's efforts are also undermined by some corrupt government officials

and law enforcements agents who have formed poaching syndicates together with some villagers living in close proximity with endangered wildlife species such as elephants and rhinos (Mapira, 2012a).

Poverty has been identified as one of the main impediments to the effectiveness of EE (Shumba,et.al, 2008). Alternative sources of energy such as electricity should be developed so that both rural and urban communities do not have to depend on wood fuel, which encourages deforestation, a major threat to natural ecosystems (Mapira and Munthali, 2011). Industrialisation should be encouraged especially in urban areas so that more jobs can be created leading to an improvement in the living standards of ordinary people. Industrialisation has the potential to encourage rural-urban migration, which can reduce populations in crowded rural areas thereby alleviating rates of land degradation in these areas. However, industries are notorious for causing air, water and noise pollution and efforts should be made to reduce their negative impacts on the urban environment (Miller, 1994).

Some researchers have suggested the privatisation of communal lands (Lopes, 1996). The argument is that under communal land ownership there is no incentive to take care of the land due to the open access that is enjoyed by all peasants, resulting in what Hardin (1968) calls the '*tragedy of the commons*'. Open access to grazing land, forests, water and wildlife resources leads to un-controlled exploitation of these resources resulting in widespread environmental degradation. If these areas were privatised, individual owners would feel obliged to conserve their lands. However, privatisation implies the granting of title deeds to peasant farmers who can be bought off their lands by potential buyers resulting in the emergence of a land-less class of people. This would worsen poverty in these areas. For this reason, most African governments including Zimbabwe do not consider the privatisation of communal areas as a viable option (Lopes, 1996).

EMA's environmental awareness campaigns have proved to be ineffective as shown by an increase in the number of veldt fires at national level (G.o.Z, 2009). This is not surprising considering the fact that the agency is hardly visible at the grass roots level

where veldt fire outbreaks are rampant. Although traditional leaders such as chiefs and kraal heads are empowered to enforce environmental by-laws in communal areas, their effectiveness has been limited by the general lack of resources such as manpower and transport for monitoring activities. The lack of environmental sensitivity among peasants has also worsened the problem as priority is given to survival issues rather than natural resource conservation (Nkala, 1996). These problems call for attention if SD has to be achieved at national level.

In Masvingo Province , for example, EMA has only managed to establish weak links with the FC, the urban council and NGOs such as; Care International, Christian Care and Caritas. It has not yet established any links with AGRITEX, PWMA and the Ministry of Mines and Mining Development, which continue to operate independently. Fragmented approaches have proved to be ineffective in the country's quest for SD in the past (Mapira and Mungwini, 2005). Although EMA was established with the aim of encouraging cooperation among all providers of EE in the country (G.o.Z, 2009), it has made little progress in that direction as existing literature shows (Mukute, et.al, 2012).

The lack of EE centres is a major setback on the dissemination of EE especially at the grassroots level (Mapira, 2012a). Although the country's EE policy document recommends the establishment of such centres throughout the country, to date none has been developed as mentioned previously. As a result, people continue to damage their environments, a reflection of the lack of positive attitudes towards their surroundings. One of the main reasons for this delay is the shortage of funds. A possible solution is the introduction of an EE levy aimed at raising funds for the development of these centres. The levy would be similar to that for AIDS, which dates back to the late 1990s (Jackson, 2002).

The establishment of more environmental lobby groups is also a possible solution (Nkala, 1996). Such groups would have to work in collaboration with EMA if they are to be effective in their public campaigns. However, their formation would depend on sponsorship from NGOs and the private sector. An example of such lobby groups is

Environment 2000, which is based in the city of Mutare and has been in existence for over two decades (Lopes, 1996). Its EE campaigns have been conspicuous even though most rural areas around the city have not been reached at all (City of Mutare, Environmental Base Line Survey, 2001). However, the problem of some NGOs is that they '*sometimes advocate conservation measures that do not consider the status of local opinion. Although global environmental concerns are important, sometimes local concerns such as land degradation are more urgent and if given support, the local communities can solve them*' (Nkala, 1996:79-80). According to Ketlhoilwe and Maila (2008), one of the major indicators of a relevant and quality EE/ESD programme is its *local context*. For example, home-grown NGOs are more effective in addressing local community challenges compared to their foreign counterparts which may be driven by external interests (Nkala, 1996).

A major achievement of EMA has been the increased number of EIA inspections as well as fines issued to offenders of environmental laws such as those of carbon emissions from industries and automobiles (G.o.Z, 2009). The fines collected have not only helped to reduce environmental crimes in towns and cities but have become a source of revenue for the cash-strapped agency. However, the *criminalisation of resource exploitation activities* has been criticised for being ineffective in environmental conservation (Chimhowu, et.al, 2010). This is because environmental sensitivity can not be developed through punitive strategies such as the issuing of fines and litigation measures. Hence there is a need to shift emphasis to more positive approaches such as EE awareness campaigns if SD has to be achieved (Chandiwana, 1996).

In the past, EMA has failed to reach some remote areas due to the shortage of vehicles for transport, fuel and spare parts (G.o.Z, 2009). If this problem is addressed, EMA can expand its outreaches to these areas. Another problem, which is confronting EMA is corruption among some of its employees who solicit for bribes in order to cover up some offenders of environmental laws (Mapira, 2012a). However, this problem is not confined to Zimbabwe as it has been reported in other parts of the globe (Miller, 1996). Another threat to the achievement of SD in the country, is the low remuneration given to EMA

field officers. If these people were well paid, they would probably resist bribery in order to protect their jobs.

EMA has also been negatively affected by the loss of experienced staff, who seek for better remuneration, and working conditions elsewhere. This has led to the loss of institutional memory in the agency, which in turn reduces its efficiency in its regular operations (Chimhowu, et.al, 2010). Government has also been criticized for failing to abide by some of its laws. For example, although EIAs are mandatory, they were never implemented during the fast track resettlement programme (G.o.Z, 2009). The failure of the government to respect its own laws means that ordinary citizens may not take such laws seriously as well. Just like the poor remuneration of EMA officials, this is also a threat to the achievement of SD.

Zimbabwe experiences rapid rates of deforestation due to the demand for both timber and wood fuel (Magadza, 1992). Although rural electrification is underway in some areas, the government lacks funds to embark on projects, which would cover the whole country. Solar energy has probably the greatest potential since it is cheap and easier to maintain compared to thermal and hydro-electric power. As a clean source of energy, it is environmentally friendly and ideal for the achievement of SD in rural areas (Chandiwana, 1996). With support from the private sector and NGOs, it can help to address problems of environmental degradation in various parts of the country. Re-a forestation schemes can be launched in order to restore damaged ecosystems and provide timber for domestic consumption thereby enabling communities to achieve SD at the local level.

In recent years EMA has embarked on EE campaigns in schools and colleges by sponsoring debates, speeches and beauty pageants (EMA's Annual Report, 2010). It has also encouraged environmental protection through clean-up campaigns. Although limited by inadequate financial resources, these strategies have a potential to create positive attitudes towards the environment among members of the public. Hence there is a need to identify such campaigns. In addition EMA should produce more literature on EE and disseminate it to ordinary citizens. This should include posters, pamphlets and copies of

EMA's calendar of events. The use of indigenous languages is important since most rural people do not speak English.

Traditional leaders in Zimbabwe are regarded as custodians of indigenous knowledge systems (IKS). Given sufficient training by EMA, they can be used as powerful agents in the dissemination of EE in their areas of jurisdiction (G.o.Z, 2009). The Traditional Leader's Act empowers these people to monitor and safeguard the exploitation of natural resources (Chimhowu, et.al, 2010). However, they have been criticised for laying too much emphasis on demanding fines (in cash or kind) or even bribes to offenders of environmental by-laws instead of educating their fellow villagers. A shift from the criminalisation of resource exploitation to EE could be a better and more sustainable solution (Chandiwana, 1996).

7.3.2: The FC and its quest for ESD

Although EE is not one of its core businesses, the FC plays an important role in the dissemination of environmental information for the achievement of SD. It collaborates with EMA in conducting environmental awareness campaigns at provincial and district levels, teaching communities about veldt fire prevention and control and educating people about the importance of tree planting. It also trains villagers on how to grow gum trees and fruit trees for domestic consumption. In addition, it disseminates information on the value of indigenous trees. In partnership with EMA, it has been involved in organising annual tree planting days throughout the country. Its core businesses, which include: conservation and extension, forest research and training are beneficial not only to Zimbabwe but also the SADC region as a whole as this study has shown. Its safari business (Ngamo) has made it financially independent unlike other government departments, which still depend on state support.

The FC's activities at community level include: facilitating tree seedling production and planting, conducting farmer training workshops on forestry issues, production and distribution of information brochures, conducting awareness campaigns on forestry issues at the community level, and enforcing the forest legislation. Although these activities are

crucial for the achievement of SD, the FC has experienced two main challenges over the years, namely: frequent electricity cuts in the country, which force people to resort to wood fuel thereby encouraging deforestation in rural and peri-urban areas, and since the FC has only one office per district, its visibility at the grass roots level is quite limited. In its pursuit of SD, possible solutions to these problems include: promoting the development of alternative sources of energy such as solar and wind, collaboration with other providers of EE such as AGRITEX and PWMA in addition to EMA, and more resources should be channelled towards EE/ESD if tangible results are to be realised on the ground.

7.3.3. Government departments and ministries

Although AGRITEX and PWMA play key roles in the dissemination of EE in rural areas, they have not forged close links with EMA, a weakness that calls for attention if SD has to be achieved. The same applies to the Ministry of Mines and Mining Development. Even though it works closely with individual mines throughout the country, it does not work hand in hand with EMA in the dissemination of EE in its regular operations. The lack of cooperation among stakeholders is a set back, which undermines the effectiveness of EE programmes at local and national levels (Mukute,et.al, 2012). EMA was established with the goal of coordinating environmental management throughout Zimbabwe (Gandiwa, 2005). But to date it has only established links with the FC, urban councils and some NGOs, an issue that calls for urgent attention if SD has to be achieved at national level. However, unless the agency is adequately funded, resourced and staffed, it is not likely to achieve its set goals.

7.3.4 Urban councils and their EE role

Urban councils provide EE to the public through their departments of environmental health. However, most urban councils and municipalities are bankrupt and lack resources for environmental awareness campaigns. Although they usually collaborate with EMA during clean-up campaigns, these events are quite rare, occurring once per year. In addition, most municipalities experience waste disposal problems that are obvious to the public (Mapira and Mungwini, 2005). Ordinary citizens can not take environmental

problems seriously when their local authorities fail to set a good example in both solid and sewage waste management. EE campaigns can only be effective if they occur within a conducive environment. Otherwise, they become mere talk shows with little or no positive impact on people's attitudes.

7.3.5 NGOS and the provision of EE

The three NGOs that were examined in this study (Care International, Christian Care and Caritas Masvingo) also provide EE in partnership with EMA even though this is not their core business. Some of their main activities include: training communities on how to conserve their environments through soil and water conservation, gully control, dam construction and gardening. In general, they endow rural people with skills, which enable them to survive under harsh (climatic) conditions thereby promoting SD at the community level. However, they are constrained by under-funding and interference from some politicians who regard them as agents of Western powers, which have a regime change agenda (Chimhowu, et.al, 2010). But in spite of this setback, they are contributing significantly in the provision of EE at national level and should be encouraged to continue to perform this important role.

7.3.6 The media's role

Both the print and electronic media play a pivotal role in the dissemination of EE in Zimbabwe as this study has shown. However, their polarity is a cause for concern (Mapira, 2013). Government-controlled media sources tend to turn a blind eye on those environmental issues, which are believed to tarnish the country's image. On the other hand, the privately owned organizations are often targets of ridicule, criticism and persecution from some politicians. While some news papers such as *The Daily News* have at one time been banned, others have had their products and premises vandalised with no action being taken against the offenders (Bond and Manyanya, 2003). Such actions are a threat to democracy and freedom of expression while in the long run they undermine the achievement of SD through the spread of EE at both local and national levels.

7.3.7 Arts and Culture and the provision of EE

This department has the potential to create positive attitudes among ordinary citizens as this study has already shown. Through drama, poetry, song and dance, it educates people on how to take care of their environment with the goal of SD in mind. However, just like others, it is neither well funded nor well staffed. Its field officers lack transport to conduct their outreaches. The need for financial support from both government and the private sector is obvious if working conditions have to improve. Since Zimbabwe's economy is going through hardships, it will take long for this to happen. Furthermore, people's attitudes take long to change, hence policy makers on EE should be patient if their goals have to be achieved.

7.3.8 Ordinary citizens

In general, little or nothing has been achieved in the education of ordinary citizens on environmental issues (Chikunda, 2007). That is why cases of deforestation, veldt fire outbreaks and the poaching of endangered animals have been on the increase over the years, according to the main findings of this study. The involvement of some top government officials in some of these crimes reflects a lack of sensitivity on natural resource conservation issues. This negative attitude is a threat to EE/ESD and natural ecosystems in general (Nkala, 1996). Failure to curb it will lead to the destruction of Zimbabwe's natural resource base and the failure of the country to achieve SD in the long run. Some researchers recommend the participation of traditional structures in addressing environmental challenges as the following quotation suggests:

'*Traditional customs play an important role in environmental management and protection in Zimbabwe. The traditional structures of headmen, kraal heads and chiefs still exist in most communal areas in Zimbabwe. Traditional leaders are custodians of customary practices. Traditional and customary laws regulating natural resources exploitation and management still exist but their impact varies from one community to another. Their effectiveness has been reduced by the fact that communities have no genuine communal proprietorship to land. Land belongs to the state and communities*

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have only usufructural rights. Access to natural resources is limited' (Chandiwana and Moyo-Mhlanga, 1996: 155).

7.4 The formal education sector's role and its implications for SD

This study has shown that the formal education sector is the main provider of EE in Zimbabwe reaching up to 83.8% of the population while EMA and NGOs account for the remaining 16.2% (Chapter Five). It can therefore be argued that the future of EE in the country lies in the formal education sector as a whole. Consequently, an examination of the implications of this scenario to ESD in the country is necessary.

Primary Schools

It has already been noted that Zimbabwe has the highest literacy rate in Africa (CSO, 2012. Since most citizens go through primary schools, they are not likely to miss the EE that is provided by them. However, the current ES syllabus lays emphasis on the **biophysical** aspects of the environment as mentioned previously. However, the inculcation of scientific facts about the environment is not likely to change people's attitudes towards the former as research has shown (Fien, 1993). EE should go beyond the mere acquisition of scientific facts if it has to develop a sense of environmental stewardship among ordinary citizens (Chikunda, 2007). Positive attitudes develop when people **take action for** the environment rather than theorising about it (Fien, 1993). They should be actively involved in solving real problems that affect their environment, for example soil erosion, pollution, environmental problems, poaching, and water scarcity.

Activities, which address these problems should start early in life especially at the primary school level. The ES syllabus should be enriched through the infusion of EE topics if it has to lay a good foundation for further studies on environmental issues. Perhaps EE should be introduced as a compulsory subject if it has to be taken more seriously in schools and colleges. The CDU should produce relevant literature on EE so that schools can use it for teaching and learning purposes. Currently there is a dearth of literature on EE/ESD in the country just as in other poverty-stricken SADC countries

(Mukute, et.al, 2012). That is why most primary school teachers can hardly define basic concepts such as EE, ESD and SD as this study has shown. Without adequate literature, teachers are not likely to develop a profound knowledge of EE/ESD as research has already shown (Ketlhoilwe, 2007).

The need to train teachers on how to teach these concepts is obvious while the lack of adequate facilities such as libraries and laboratories are problems, which undermine the teaching of EE in most schools. Furthermore, the lack of funds for field trips is another handicap while the lack of EE centres is another challenge, which needs to be addressed as soon as possible. Although the EE policy document recommends their establishment, to date none has been developed due to the lack of funds and the necessary political will on the part of the government. If a levy similar to that on AIDS were to be introduced to tax payers, it would probably generate considerable funds for the EE programme in the country (Jackson, 2002).

Secondary Schools

This study has shown that to date secondary schools have not yet infused EE into their curricula even though there are plans to do so in future (G.o.Z, 2003). Possible options include the infusion of EE topics in O' Level subjects such as: Geography, Science and Agriculture or the introduction of EE as a separate subject. However, the latter option has been criticised due to the fact that the school curriculum is already over-loaded and can not absorb more subjects (Shava, 2003). This not surprising as the country's education system has been borrowed from its Western colonial masters (Lotz-Sisitka, 2005). Another problem is that the curriculum is examination driven ((Chikunda, 2007) and is therefore too rigid and overloaded to accommodate more subjects (Lotz-Sisitka, 2005). On the other hand, the infusion of EE topics in existing subjects is not likely to yield fruits since EE is too broad to be adequately covered in one or two topics (Ketlhoilwe and Maila, 2008).

In Zimbabwe, the teaching of EE at secondary school level is hampered by several challenges, according to Murwendo, Tshuma and Chinyani (2009). Firstly, there is a

general lack of appreciation for the importance of EE especially within the context of an overloaded and examination driven curricula. Secondly, there is a shortage of adequately trained educators who can infuse EE into various subject disciplines. Thirdly, the shortage of EE teaching materials, a problem which prevails in most SADC countries, is another challenge. Fourthly, there is a shortage of funds for field trips. There is also a lack of continuity from primary to secondary school. While at the primary level ES is compulsory, in secondary schools, environmental issues are hardly given adequate attention except in a few subjects such as: agriculture, geography and science. There is also no syllabus for SD at secondary school level, which undermines the teaching of EE. Another problem is the fact that there is a clear distinction between core and optional subjects at O'Level. While core subjects (English Language, Shona/Ndebele Mathematics, Science, Geography and History) are compulsory, their non-core counterparts are not. Students who opt not to do optional subjects such as agriculture, woodwork and economics lose out on the EE that may be taught in these subjects.

Although the use of school clubs to teach EE is commendable, not all students join the clubs as they are not compulsory. The result is that some students can go through their school days without having received EE/ESD at all. This has negative implications on SD. Secondary schools also experience problems such as lack of experts to teach EE, inadequate resources such as; literature and laboratories as well as lack of funds to conduct field trips. However, if EE was introduced as a compulsory and examinable subject, it would be taken more seriously. Not only would it be included on the school time table, but it would also have a budget just like other subjects. The CDU would produce the necessary literature (textbooks and other teaching/learning materials) for the new subject. Schools would establish links with EE centres for the supply of relevant information.

Colleges and universities

Teacher's colleges and universities should introduce EE as a compulsory subject or course so that all students take it. This should apply to all departments and faculties. Research should also be promoted in these institutions so as to generate the much needed

relevant literature (Ketlhoilwe and Maila, 2008). Currently EE has been relegated to environmental clubs, which are not compulsory. As a result most students graduate from these tertiary institutions without having received EE at all. Colleges and universities are renowned for producing leaders and role models at both community and national levels. However, if they lack EE, they are not likely to set a good example on environmental issues at their work places, in their communities and at national levels. The goal of education is to produce individuals who can contribute to social transformation (Ketlhoilwe, 2007), something that is lacking in Zimbabwe as this study has shown. From a SD perspective, this is regrettable as the environment would continue to be damaged with little or no action being taken to solve the problem (Nkala, 1996).

7.5 Orientation of Zimbabwe's EE programme to SD goals

In keeping with one of the research goals, this study sought to establish whether Zimbabwe's EE programme is oriented to the achievement of SD. The EE policy document identifies its long term goal as making sustainable development a national priority (G.o.Z, 2003). It goes further to explain how this will be achieved. The role of each provider is clearly stated with so much detail that there is no room for ambiguity at the implementation stage (Mapira, 2012a). However, in spite of this detailed and comprehensive policy document, little has been achieved at the grass roots level (Mukute, et.al, 2012). This is due to several factors, which include: poverty, the lack of funds, resources, and government's lack of commitment in the implementation of its own EE policies (Nkala, 1996). Chikunda's (2007) study of the country's BEST programme reflects a **rhetoric-reality** gap which should be closed if sustainable development should be achieved at both local and national levels. For example, teaching methodologies in the country still rely heavily on **neoclassical** models and approaches which are reminiscent of the colonial era.

On the other hand, the examination biased curricula are so overloaded that they give no room for EE/ESD (Lotz-Sisitka, 2005). Consequently, local communities are alienated from the education of their offspring thereby undermining the inclusion of indigenous knowledge systems (IKS) which have the potential to solve local environmental problems

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(Mapira and Mazambara, 2013). According to Lotz Sisitka (2005), these challenges are common to most SADC countries. It can therefore be argued that in Zimbabwe (just as in some of its neighbours), there is a wide gap between policy statements and the situation on the ground. Indeed, research shows that '*A problem often cited within the SADC states is the gap between policy and practice. Excellent policy may exist, but if it is not reflected in practice, then little has been achieved by its formulation. In some instances the reason for the gap is not lack of will for implementation, but the fact that the policy was designed without practice in mind, and is, in essence, not implement-able. In order to derive maximum benefit from the existence of a policy, it is important that the policy is formulated with a view to implementation*' (SADC IUCN Report, 1999: 19).

From the main findings of this study, it is doubtful whether Zimbabwean EE policy makers had implementation in mind since there is little or no reference to financial or resource constraints in the document (G.o.Z, 2003). Although in theory, the policy is excellent, the situation on the ground does not favour its implementation (Chikunda, 2007). It is therefore not likely to achieve its intended goals of SD at the grass roots level. In the light of this observation, there is a need for policy makers to go back to the drawing board in order to re-adjust their policy so that its goals can be achieved. The other option is for government to take its policy more seriously through the demonstration of political will, which has been lacking for several decades since independence (Nkala, 1996). Through the establishment of EE centres and curriculum change, the government can achieve its SD goals in the long run.

7.6 SADC REEP efforts and Zimbabwe's quest for SD

An examination of Zimbabwe's progress in EE cannot be complete without a look at the efforts which have been made at the SADC regional level. When the SADC REEP was formed in 1997, its main aim was to '*strengthen environmental education processes for equitable and sustainable environmental management choices*' (SADC REEP Information Brochure, 2008:1). This would be achieved by addressing five key areas, which included: policy, resource development, networking, training and research and evaluation. Since its inception, the SADC REEP has gained international recognition for

'*best practice*'. According to the information brochure, some of its partners include: UNEP, UNDP, UNESCO and IUCN. Consequently, Zimbabwe now has a well documented EE policy (G.o.Z, 2003).

However, its implementation has been undermined by several factors, which include: climate change, biodiversity loss, rural poverty, resource constraints and the lack of political will (Mapira, 2012a). Some of these factors also undermine ESD programmes in other parts of the sub-region as the following quotation shows: '*Southern Africa has been identified as one of the regions that are most at risk from the impacts of climate change and loss of ecosystem services. Approximately 70% of southern Africans live in rural areas, and depend on the natural environment for their livelihoods and food security. Most economies in the SADC region are natural resource dependent. Environment is therefore intimately linked to development, poverty alleviation and future well-being in a southern African context*' (SADC REEP Information Brochure, 2008:2).

According to the same source, at the regional level, there has been a massive development of ESD literature with '*more than 200 ...contextually specific learning materials*' being produced since 1997 (page 2). Furthermore, over 2 500 entries have been regularly updated at the SADC REEP centre in South Africa. However, in spite of these impressive developments, there is little or no impact at the grass roots level in most parts of southern Africa. For example, in Zimbabwe this literature is scarce even in schools, colleges and universities as the main findings of this study have shown. This is mainly due to distribution problems. Research has shown that it is one thing to produce good learning materials and quite another to deliver them to their intended beneficiaries (Lotz-Sisitka, 2005).

Networking refers to the dissemination and sharing of information and expertise within the sub-region. Some 15 national network representatives are based in each SADC state (SADC REEP Information Brochure, 2008). This ensures that the programme remains relevant to all SADC countries. According to the same brochure, EE practitioners are also regularly updated on ESD issues through electronic newsletters. This regional network

involves more than 400 active organisations and more than 700 EE practitioners in the region. However, in Zimbabwe, the impacts of these developments on ordinary citizens are not visible as this study has shown. Only those who have access to the internet and are interested in ESD issues benefit from them. Rigorous awareness campaigns should be made in order to disseminate such information to the public.

Since 1998 the SADC region has been offering professional development courses for ESD practitioners (SADC REEP Information Brochure, 2008). The trainees have been drawn from formal and non-formal education sectors including: teachers, education officers, college and university lecturers, curriculum developers, community educators, conservation educators, media practitioners, and natural resource management educators. While some courses are short (a few days or weeks), others are much longer (such as international training programmes). Some of the training activities have been conducted or coordinated by Rhodes and other South African universities. Zimbabwean universities have not been offering ESD training services and reasons for this apathy, are not clear. However, this probably reflects the general lack of interest in environmental issues at national level (Lopes, 1996).

The goal of research in the sub-region has been to '*support innovation and reflexive practice. Collaborative activities have been initiated, and a research network involving a number of southern African higher education institutions exists*' (SADC REEP Information Brochure, 2008:1). These research networks have increased an understanding of the relationship between poverty, health, environment and education in the SADC region. The main activities of the SADC REEP efforts include: the establishment and support of research networks involving ten higher education institutions, providing support for regional participation research activities at national level, and the implementation of monitoring and evaluation processes.

Although the University of Zimbabwe is one of these institutions, its impact at the grass roots level has not yet been felt. This reflects the ineffectiveness of the SADC REEP programme at the national level. However, this is not surprising as other countries in the

region are also facing similar problems as Lotz-Sisitka's (2005) report has shown. In recent years the REEP headquarters in Howick has embarked on the production of relevant ESD literature (in the form of information guides or source books) for member states (SADC REEP, 2012). This innovation has enabled EE/ESD literature to meet the individual needs of each country even though poverty issues remain unsolved in the sub-region (Mukute, et.al, 2012).

7.7 Summary

This chapter has discussed the implications of Zimbabwe's EE programme in the country's quest for SD. It has examined the challenges experienced by various EE providers and suggested possible solutions for them. For example EE should be introduced as a compulsory, examinable and time-tabled subject/course in all formal institutions of learning rather than being taught sporadically in some schools or colleges. The problem of funding can be addressed through the introduction of an EE levy while the scarcity of relevant literature can be solved by promoting research in tertiary institutions. The CDU can be tasked to develop teaching/learning materials for the new subject at primary, secondary and college levels. Government should also take its EE policy more seriously than it has done in the past (Lopes, 1996). This can be demonstrated through adequate funding and staffing of EMA and other organizations, which provide EE.

In the past it has launched resettlement programmes without conducting EIAs thereby breaking its own laws since the latter are mandatory (Bond and Manyanya, 2003). Such developments reflect government's lack of seriousness in the implementation of some of its policies, which undermines SD at local and national levels. The plunder of wildlife resources through poaching activities, which involves some top government officials has a similar effect and should be discouraged through stiff penalties for those convicted. The chapter has also examined the country's quest for SD in the light of its national EE policy as well as the SADC REEP goals. It was concluded that the country still has a long way to go before it can achieve both regional and national goals of ESD. The next chapter provides a conclusion and recommendations drawn from the main findings of the study.

CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS

8.0 Introduction

This study fills an important gap in the **EE-SD nexus** with a special focus on Zimbabwe. Although EE in Zimbabwe dates back to the colonial era, not much has been written about it over the years. However, since the 1990s it has assumed a new dimension due to the infusion of SD concepts, which emerged from the Brundtland Commission's Report of 1987 (WCED, 1991). This study is intended to benefit researchers, academics, policy makers and those developing countries, which may be pursuing similar programmes (as mentioned in Chapter One). This chapter provides conclusions and recommendations for the whole study. This is done in the light of research questions and objectives which were posed in Chapter One, the conceptual framework (Chapter Three) and the main findings, which emerged from the study. As a developing country, Zimbabwe is experiencing numerous challenges in the implementation of its EE programme (Mandishona, 1996; Chikunda, 2007; and Mapira, 2012a).

The study has shown that Zimbabwe's EE programme is generally weak, failing to change ordinary people's attitudes, actions and lifestyles towards their environment (Chikunda, 2007). In its quest for SD, the country faces numerous challenges, which have been discussed in previous chapters. They include: poverty especially in rural areas, the lack of political will among policy makers and government officials who do not take environmental issues seriously as shown by some of their criminal activities (Mapira, 2012a). For example the involvement of some cabinet ministers in the poaching of endangered animals such as elephants and rhinos, reflects the lack of a sense of stewardship for these resources. Cabinet ministers are supposed to be role models in issues of national interest such as the protection of endangered animals. Their failure to do so inevitably sets a bad example to ordinary citizens who look up to them for guidance on these issues.

Even though Zimbabwe has a comprehensive EE policy document (G.o.Z, 2003), this has not helped the country to manage its environment and natural resources effectively. Over the years, cases of veldt fire outbreaks, deforestation and biodiversity loss, gold/diamond panning and the poaching of wildlife resources have been on the increase as findings from this study have shown. According to Palmer (1998), countries with weak EE programmes display three main characteristics, namely: governments, which prioritise economic progress at the expense of environmental protection, refusal to abide by the terms of some international agreements such as the Kyoto Protocol, and societies which are materialistic to the extent of marginalising environmental protection issues. Although these characteristics are typical of industrialised countries such as China, India and the USA, some of them can be applied to developing nations such as Zimbabwe as the main findings of this study have shown. The aim of this chapter is to draw some conclusions of this study and make recommendations for the improvement of the EE/ESD programme in Zimbabwe.

8.1 Conclusions

Zimbabwe's EE programme dates back to the colonial era when it was provided in the form of conservation education in white commercial farms, APAs and TTLs (Whitlow, 1988). The NRB, which was formed in 1941, played a key role in the dissemination of EE in these areas. In primary schools, EE was taught in the form of Nature Study from 1954 until the early 1970s when Environmental Studies took over. In 1994 Environmental Science (ES) was introduced to replace the former. Since then it has been taught in all schools in the country. In spite of these historical developments, Zimbabwe did not have a policy document until 2002 when the Environmental Management Act (20:27) was promulgated (Gandiwa, 2004). This was followed by the establishment of an environmental agency (EMA), which came into operation in 2007.

As mentioned previously, EMA was formed through the merging of three government departments (the NRB, ZINWA's Water Quality Section and the Ministry of Health's Hazardous Substances and Atmospheric Pollution sections). Its mandate is to promote environmental management and protection with a view to reducing poverty and

improving the quality of life of ordinary citizens (G.o.Z, 2009). One of its goals is to educate people on environmental issues with the goal of attaining SD at both local and national levels. In the execution of its mandate, EMA cooperates with other providers of EE such as government departments, ministries urban councils and NGOs (G.o.Z, 2003).

However, its main challenges over the years have been under-funding, under-staffing, under-resourcing and the lack of political will among policy makers (Mapira, 2012a). Consequently, together with its partners, EMA provides only 16.2% of the EE delivered to the public, a small figure compared to what is contributed by the formal education sector (Figure 5.1). To date EMA has only managed to link up with the FC, urban councils and some NGOs. AGRITEX, PWMA and the Ministry of Mines and Mining Development continue to operate individually in the provision of EE, which reduces their effectiveness at the grass roots level. In the past, fragmented approaches in environmental management have proved to be un-sustainable (Mapira and Mungwini, 2005). Ironically, EMA was formed with a view to addressing this problem, which it is failing to solve (Mukute, et.al, 2012). This undermines the country's quest for SD in the long run.

The main providers of EE in Zimbabwe are: schools, universities and teacher's colleges, which account for 83.8% of the total EE provided in the country. With the exception of universities, these institutions teach environmental science (ES), geography and integrated science. They educate pupils/students **about** and **through** rather than **for** the environment (Fien, 1993). Consequently, products of this form of education lack environmental sensitivity, responsibility and stewardship, important attributes for citizens who should take care of their environment (Chikunda, 2007). Most respondents who received EE from these institutions had problems in defining basic concepts such as EE, ESD and SD, an indication of their ineffectiveness in the delivery of EE in the country (Ketlhoilwe, 2007). For this reason, this study makes several recommendations for the improvement of EE programmes in the country.

Although the EE policy document recommends the establishment of EE centres throughout the country, to date none has been developed. This is due to the lack of funds

as the country is experiencing economic problems. There is also a lack of commitment among policy makers as some researches have shown (Nkala, 1996). The government does not always respect its own laws as shown by its failure to implement some of its policies, for example EIAs prior to the launching of the fast track land redistribution programme (Chimhowu, et.al, 2010). In schools and teacher's colleges, EE has not yet been infused in subjects or courses a decade after the promulgation of the country's EE policy in 2003 (Mapira,2012a). Obviously the proposed changes in the curriculum are taking too long to be implemented, an indication of government's lack of political will on issues of environmental protection as previous studies have already shown (Lopes, 1996).

8.2 Suggestions for the improvement of ESD in the SADC region

Previous chapters have exposed several challenges which confront EE/ESD programmes in the SADC region. Consequently, the regional grouping has made several recommendations for the improvement of its ESD programmes (SADC Report, 1999). Firstly there is a need to provide EE support at ministerial level. This would not only reflect government commitment but also provide funding for the programmes. Secondly, legislation should be created for the inclusion of environmental education in schools, colleges and universities. Thirdly, relevant partnerships should be formed between the state and civil society in order to promote ESD implementation. Fourthly, participatory processes aimed at broadening the ownership and responsibility for environmental education should be formed between ESD providers and their surrounding communities. Finally, appropriate approaches and methodologies, which incorporate indigenous knowledge systems (IKS), should also be adopted (Le Grange, 2011). They should be based on the **local context** so that they can be relevant to community needs (Ketlhoilwe and Maila, 2008).

8.3 Recommendations for Zimbabwe

Although Zimbabwe's EE policy document is comprehensive and detailed, leaving no room for ambiguity at the implementation stage, this has not helped it to make meaningful progress in the implementation of the policy at the grass roots level (Mapira,

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2012a). This is due to several challenges, which have been discussed in previous chapters of this study, namely: government's lack of commitment on issues of the environment, economic interests, and ordinary people's lifestyle problems due to poverty, which drives them into activities which damage the environment. Consequently, the study makes recommendations on how the EE programme can be improved for the achievement of SD at local and national levels. Again, this is done in the light of the main research questions, which were posed in Chapter One and the main findings of the study.

The non-formal and informal education sector

In the non-formal and informal education sector, several recommendations are made including:

EMA's Role

It has been mentioned that in the non-formal and informal education sector, EMA is the leading agency in the provision of EE. However, this study has shown that together with some of its partners, it is reaching only 16.2% of Zimbabwe's population. This is due to under-funding, under-staffing, and under-resourcing which undermine its operations thereby making it invisible at the grass roots level. The agency is also quite new, having been established in 2007 (G.o.Z, 2009). This implies that it still has a long way to go before it can be self-reliant. In the mean time, it has to depend on state support if it has to survive. Government should adequately fund the agency so that it can execute its mandate more effectively. Funds can be raised from the introduction of an EE levy on tax payers or through foreign donor support. EMA should extend its links to other government departments and partners, which are currently operating individually in the delivery of EE such as the Ministry of Mines and Mining Development, AGRITEX and PWMA.

Fragmented approaches have proved to be ineffective in the past (Mapira and Mungwini, 2005). EMA was established in order to address the problem of fragmentation in the provision of EE and environmental management at national level (Gandiwa, 2004). Government should also improve its commitment on issues of the environment (Lopes,

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1996). The existence of poaching syndicates, which include top civil servants, law enforcement agents, villagers and some cabinet ministers is a cause for concern as it undermines Zimbabwe's EE programme and its quest for SD. Deterrent legal action should be taken against any offenders who are proved guilty by the country's courts. This will probably send a message to other potential offenders of the country's environmental laws. However, research also suggests that in addition to litigation, there should be environmental awareness campaigns so as to educate citizens about the dangers of some of their actions (G.o.Z, 2009).

The FC

The FC has been cooperating with EMA in the provision of EE. It has contributed immensely in tree planting, research and training. As a self-reliant organisation, it is a role model to those government departments, which are financially unstable. Through Ngamo Safaris, it has managed to generate adequate funds for its operations. However, in spite of this achievement, the FC is under-staffed at provincial and district levels, a fact which undermines its effectiveness in the provision of EE throughout the country. There is an urgent need to address this problem if the organisation has to improve its effectiveness at local and national levels. As a financially stable organisation, it can afford to employ more staff without straining its budget. However, to date the government has not made any efforts to improve its staffing situation, indicating the lack of political will among policy makers as mentioned previously.

AGRITEX and PWMA

Although they play an important role in the dissemination of EE, these organisations have not yet established working relations with EMA. As a result, they continue to operate individually as they have done in the past. Even though EMA has a duty to initiate links with them, it has failed to do so in the past due to the lack of adequate resources such as funds, equipment and staffing (Mukute, et.al, 2012). Hence there is a need for adequate government funding if EMA has to effectively play its coordinating role. It should be remembered that as a newly formed organisation, EMA still needs more time and funding if it has to be self-reliant in its regular operations (Chimhowu, et.al, 2010). The

introduction of EE/ESD in agricultural colleges is a land mark development in Zimbabwe as it will supply AGRITEX with graduate extension officers who can train ordinary villagers on EE/ESD issues for the long term goal of SD (Mukute, et.al, 2012).

The Ministry of Mines and Mining Development

As a mineral rich country, Zimbabwe has a thriving mining industry, which is notorious for causing environmental degradation. For this reason, there is a need for it to be more involved in reclamation and EE activities. Some mines such as Bikita Minerals, Mimosa and Murowa are doing well in this respect. However, others have set bad examples by failing to restore damaged environments. Examples include defunct ones such as: Buchwa Iron Ore and Vanguard Asbestos mines. Others are Shabanie and Mashaba Asbestos mines whose old shafts and dumps are an eye sore to the public (Mapira and Zhou, 2006).

There is also a need for the government to enforce its reclamation and de-commissioning regulations. In the past, this has not been possible due to the lack of a legal framework to do so (Chiwota and Hauge, 1996). However, it is now mandatory for mines to reclaim their environments before de-commissioning is conducted (Mapira and Zhou, 2006). To date, the ministry has not established working relations with EMA just like AGRITEX and PWMA, which have been mentioned above. This is due to EMA's lack of funds and resources to execute its mandate, as mentioned previously. The sooner this problem is solved, the better.

EE Centres

As mentioned previously, the EE policy document recommends the development of these centres throughout the country (G.o.Z, 2003). However, to date, a decade after the promulgation of the policy, none has been established. Obviously, the development of these centres is long overdue and the government should establish them as soon as possible. Once established, the centres would perform at least two functions, namely: increasing the publicity of EE information to members of the public, and acting as resource centres for schools, colleges, universities and surrounding communities.

However, a lot of funds would be required for such a massive project. As noted previously, South Africa has been operating EE centres since the 1990s (Palmer, 2002). Zimbabwe can learn from its southern neighbour how to establish and run these centres.

The government has at least two options. namely: soliciting for funds from the donor community or introducing an EE levy to all tax payers as it has done for HIV and AIDS (Jackson, 2002). In the case of donor funding, the government would have to mend its relations with Western countries, which are the main sources of financial aid. The hostility of the government against these countries dates back to the 2002 disputed presidential elections when the ruling party, the Zimbabwe African Union-Patriotic Front (ZANU-PF) was accused of perpetrating violence on the electorate as well as rigging the elections (Bond and Manyanya, 2003).

Urban Councils and municipalities

Although they cooperate with EMA during environmental clean-up campaigns, most urban councils and municipalities lack resources for the provision of EE. Hence it is not a priority in their annual budgets. They also fail to set a good example in waste disposal and management, hence their attempts to educate citizens on environmental issues have little or no impact on members of the public who are aware of their inability to maintain clean and safe environments in towns and cities (Mapira and Mungwini, 2005). There is a need for the government to adequately fund them so that they can execute their EE mandate more effectively.

NGOS

Most NGOs, which operate in Zimbabwe, are under-funded (Lopes, 1996). As a result, they lack the capacity to effectively provide EE to the public. Some of them are also victims of persecution from those politicians who regard them as agents of the Western countries' so-called regime change agenda (Bond and Manyanya, 2003). This reduces their effectiveness in executing their mandate. There is a need for the government to create a more conducive environment for the operation of all NGOs, especially those which are involved in the provision of EE. For example, a less hostile environment would

attract more funding from foreign donors thereby making these organisations more effective in their daily operations. However, as long as the government maintains a hostile attitude towards Western countries, this is not likely to happen. NGOs should also promote community projects which are home-grown rather than externally driven ones (Nkala, 1996). An example of a successful local NGO is CAMPFIRE, which specialises in community based wildlife management (Chandiwana and Moyo-Mhlanga, 1996).

The Media

This is another sector which requires attention from the government if it has to promote EE in the country. Political interference coupled with poor funding are issues of concern in the country and should be addressed as matters of urgency (Mapira, 2013). As long as the media is polarised along political lines, the flow of EE information will continue to be restricted in some ways, hence the need for government to change its attitude so as to reform the sector with a view to liberalising it. However, such a reform is not likely to take place within the current dispensation, which is characterised by intense acrimony between the government and some opposition political parties as this study has already shown.

Other challenges facing the country's media include: the lack of skilled reporters who can write effectively on EE issues, inadequate resources such as vehicles to transport reporters to some remote parts of the country, and the predominance of English over indigenous languages which most people are conversant with (Mapira, 2013). The electronic media (such as: radio, television and the internet) is generally restricted by the lack of electricity in most rural areas. However, recent efforts aimed at rural electrification are a positive development in the country ((Chimhowu, et.al, 2010). Efforts are also underway to take advantage of solar and other renewable sources of energy (Mukute, et.al, 2012). Government should continue to encourage such developments for the benefit of EE dissemination at local and national levels.

Arts and Culture

The main problem of this sector is inadequate funding. Government and the private sector should provide financial aid so that it can be more effective in its regular operations. Works of art such as: drama, song, poetry and dance can be used effectively to educate the public on EE/ESD issues. However, low salaries, under-staffing and the lack of vehicles restrict the daily operations of field officers at local and district levels as this study has shown. If these issues were addressed, this would improve the dissemination of EE to the public. However, this is not likely to happen in the near future due to the prevailing economic conditions in the country.

Grassroots Structures

Grassroots structures play a key role in community development projects such as those linked to environmental management and EE/ESD. Experience shows that in order for SD efforts to yield positive results, they should be based on strong grassroots structures (Nkala, 1996). Although external support is necessary in some cases, it should not override local backing. According to Chandiwana and Moyo-Mhlanga (1996, 155-6) '*It is important to note that people's initiatives and participation have shown signs of sustainability where there is a strong cohesive foci of community leadership. These could be local authorities, chiefs, religious leaders, and if they are strong and interested in community development, environmental management becomes more sustainable*'. This argument concurs with Ketlhoilwe's and Maila's (2008) view that one of the attributes of a quality and relevant EE/ESD programme is its link with the local context. This implies that such a programme addresses local environmental challenges through home-grown initiatives.

Ironically most Zimbabwean development projects lack local popular support as they are donor-driven (Nkala, 1996). Furthermore, the influence of colonialism has not yet died out as the following quotation shows: '*In Zimbabwe, the role of grassroots communities in resource conservation has been severely undermined mainly due to the impacts of colonialism. The process began with the enactment of alienation laws and the subsequent implementation of colonial policies which marginalised the majority of the people to*

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unproductive areas. Even after independence, environmental policy does not adequately address environmental problems in the communal areas because the same colonial statutes have not been repealed. The government has over the years set up structures to facilitate resource management at grassroots level and these should be continually reviewed to ensure their relevance and effectiveness' (Chandiwana and Moyo-Mhlanga (1996, 144). There is an urgent need to re-orient these structures so that they become more relevant to local EE/ESD challenges (Chikunda, 2007).

The Formal Education Sector

The formal education sector is the major provider of EE in Zimbabwe, reaching nearly 84% of the national population according to the findings of this study (Figure 5.1). However, the sector has numerous challenges which should be overcome if EE/ESD has to be effective. Since the country has the highest literacy rate in Africa (CSO, 2012), policy makers can take advantage of this reality in boosting the spread of EE and promoting SD at national level. In the light of the above challenges, several recommendations are made here. Firstly, the country should reform its Western-designed education curriculum which dates back to the colonial era and replace it with a new educational system (and new philosophy), which is more transformative in nature (Chikunda, 2007). Secondly, there is a need to re-align the new education system of education with the current EE/ESD challenges facing the country.

Thirdly, in designing a new educational philosophy, efforts should be made to bring schools, colleges, universities and local communities together so that they can collaborate in teaching, learning and research projects. Some rural communities are endowed with a rich heritage of IKS which date back to the pre-colonial era (Mapira and Mazambara, 2013). Such IKS can be integrated into the new formal education system thereby making them more relevant to the local context (Ketlhoilwe, 2007). On the other hand, teaching methods should move away from trans-missive (teacher-centred) to transformative (pupil-centred) approaches which are geared at the solution of real life problems (Chikunda, 2007).

Another challenge is the predominance of over-loaded curricula especially at the secondary school level (Lotz-Sisitka, 2005). This has led to congested school time tables which leave no room for EE/ESD slots as this study has shown. Poverty, resource constraints, and the lack of political will at government level are other hindrances which call for attention (Nkala, 1996). Although to date Zimbabwe has more than ten universities, none of them has introduced post-graduate programmes in EE/ESD. This is a gap which should be closed as soon as possible. Without a profound knowledge on EE/ESD issues, these universities are not likely to produce socially critical graduates who can lead efforts in social transformation (Ketlhoilwe and Maila, 2008).

Pre-schools

Although the EE policy document, which was published in 2003 proposed the introduction of EE at pre-school level, to date this has not materialised due to the lack of funds and probably the necessary political will as well (Mapira, 2012a). There is a need for government to implement its policies as soon as possible so that it does not lose credibility among the electorate. It should be born in mind that policies are only worthwhile if they are implemented (in time), otherwise they are of no practical value at all.

Primary schools

Since independence in 1980, Zimbabwe has embarked on a massive expansion of education at both primary and secondary levels. Consequently, the country now has the most literate population in Africa (CSO, 2012) as mentioned previously. For example, in 2012 during the fieldwork period of this study in Masvingo Province alone, there were 855 primary and 333 secondary schools, respectively. Since schools are major providers of EE in Zimbabwe, they are expected to play a significant role in social transformation (Fien, 1993). However, Chikunda (2007) has noted that the type of EE delivered in schools lacks the necessary ingredients for social transformation. For example, the ES syllabus lays too much emphasis on the biophysical aspects of the environment at the expense of social and economic concerns. There is also no interdisciplinary coordination

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among various subjects in the primary school. Furthermore, there is no cooperation between schools and communities in the education of children.

Another problem is the teacher-centred methodologies which undermine the development of socially critical pupils who have the potential to contribute to social transformation, an important attribute in the teaching and learning of EE (Fien, 1993). On the other hand the examination biased time table is too congested to give room for activities such as field trips and activities such as community participation in problem solving (Chikunda, 2007). In to address these challenges, several recommendations can be made. Firstly, the ES syllabus should be revised in order to incorporate EE topics so that it lays a better foundation for higher levels of education. Primary school teachers should also be rigorously trained on the teaching of EE concepts since they lack the expertise to do so according to the findings of this study. In-service training for all teachers can be conducted through staff development work shops during vacations at selected centres in the country. On the other hand pre-service training can be done at colleges and universities. Funding for in-service staff development programmes can be derived from the EE levy, which this study has already suggested.

The CDU can produce the required teaching materials such as teaching guides and learning aids. These materials should lay emphasis on the local context if they are to benefit schools in various parts of the country (Ketlhoilwe, 2007). The country can also procure more EE/ESD literature from the SADC REEP centre in South Africa in order to strengthen its literature base. However, the most important issue to be addressed is that of a change in educational philosophy of so that it is geared to the resolution of local environmental challenges. According to (Chikunda (2007, 169) such an education system should also '*bring about closer relationships between schools and their communities in the learning process*'.

Secondary schools

 The study makes several recommendations on the improvement of EE in secondary schools. Firstly, EE can be infused in subjects such as geography, science and agriculture.

In practice, this would involve the inclusion of EE topics in the respective syllabuses so that teachers and students can take them seriously since they would be examinable. Secondly, EE can be introduced in schools as a compulsory subject. Although the school curriculum is already over-loaded, this would be a worthwhile development since the environment is crucial for the survival of humankind and other inhabitants of our planet (Miller, 1996). Any attempt to ignore this fact has disastrous consequences as this study has already shown.

Thirdly, teaching methods in schools should be less trans-missive and more transformative if they are to be effective in the inculcation of skills (Chikunda, 2007). The local environment or context should also play a major role in the education of students as Ketlhoilwe's (2007) study suggests. Obviously teachers would have to undergo training on EE/ESD issues if they are to be effective in their work (SADC, 2012). The whole curriculum would also have to be re-aligned so that it becomes more relevant to the local context (Lotz-Sisitka, 2005). It has already been noted that a major weakness of curricula in most SADC countries is that they have not yet been reformed from their colonial past. This is in sharp contrast with such countries as: Australia, Canada and the UK, which have transformed their whole curricula and incorporated EE/ESD at all academic levels (Palmer, 1998). Zimbabwe can draw some lessons from their experiences and achievements.

Colleges

It is pleasing to note that agricultural colleges have already adopted EE as part of their curricula (Mukute, et.al, 2012). Graduates from these colleges will be expected to play a crucial role in the delivery of EE throughout the country thereby contributing to social transformation. In teacher's colleges EE should also be infused into the curricula so that it is taken more seriously. It should be made compulsory and examinable instead of being relegated to clubs where it is optional and difficult to monitor as this study has shown (G.o.Z, 2003). All students would have to pass it before they are allowed to graduate. In this way, it would be taken as seriously as other subjects in the college curriculum. Lecturers would have to be rigorously trained to ensure that they are effective in training

their students. Under these conditions, EE/ESD has the potential to instil environmental sensitivity, positive attitudes and a spirit of environmental stewardship among staff and students (Fien, 1993). However, colleges and institutions should project their vision beyond their lecture rooms since environmental issues have no boundaries (Miller, 1996).

Universities

The current ES courses offered in most faculties of education in the country's universities do not adequately cover EE issues as the emphasis is on scientific facts about rather than education for the environment (Chikunda, 2007). The result is that most graduates lack a sense of environmental stewardship, a necessary ingredient of EE (Fien, 1993). There is a need to revise the present university curricula so that they meet the needs of their potential students in schools and teacher's colleges. In all other faculties, EE can be made a compulsory course for all students so that they can develop a sense of environmental stewardship before they graduate from universities.

Under these conditions, research on EE issues would be promoted in order to generate literature for both lecturers and their students. Students would also be involved in caring for their environment through activities such as: clean up campaigns, soil erosion control, the prevention of veldt fires, water harvesting, and tree planting. It is also necessary for the country's universities to introduce post-graduate degrees in EE as Botswana has already done (Mukute, et.al, 2012). This would equip the students with a profound knowledge on EE/ESD issues which is crucial for social transformation and SD (Ketlhoilwe and Maila, 2008). Australian universities are well known for producing internationally acclaimed researchers who have influenced the direction of thinking on EE/ESD issues (Robottom, 1998). Zimbabwean universities should draw lessons from such developments and try to put them into practice. However, this calls for more political will, financial and material resources at both national and institutional levels, something, which is generally lacking in the country (Mukute, et.al, 2012).

Funding of the EE programmes

This study has suggested the introduction of a levy that would raise funds for EE programmes at national level. Although Zimbabweans are already heavily taxed, issues of the environment are too important to be ignored by both present and future generations (WCED, 1991). Another alternative would be soliciting for foreign funds. In the past, the country has received numerous donations from Western donors who are champions of the environmental cause (Nkala, 1996). However, the country has to grapple with the problem of donor fatigue if it takes this option. Furthermore, it would also have to mend its strained relations with Western donor countries, which have imposed travel bans on some of the country's key political leaders (Mpofu, et.al, 2009).

Teaching materials

The scarcity of teaching and learning materials has undermined EE in most SADC countries (Mukute, et. al, 2012). In Zimbabwe, the CDU plays a crucial role in the development of teaching materials (for schools and colleges) including: syllabi, teaching guides/materials and aids. Together with individual authors or researchers, it can be tasked to develop literature and materials for the teaching of EE in schools and colleges. Universities, on the other hand, can take advantage of their research experts to produce modules and textbooks on EE. Furthermore, the SADC REEP programme produces a lot of literature, which can be used for teaching EE/ESD at various academic levels (Lotz-Sisitka, 2005). Some of this literature (such as sourcebooks) has been developed with the local context of each country in mind (SADC REEP, 2012). However, efforts should be made to obtain it from Howick in South Africa or simply download it from the internet.

Teaching Methodologies

This study has already shown that there is a need to **re-orient teaching methodologies** in Zimbabwe so that they are brought into line with the goals and objectives of EE/ESD. For example, schools should get rid of those traditional (*neoclassical*) teacher-centred approaches and replace them with modern (*transformative*) methods which are pupil-centred. In support of this view, Chikunda (2007, 160) advocates for a paradigm shift from neoclassical to '*social constructivism and socially critical orientations...Critical*

perspectives entail questioning appearances and taken-for-granted practices, probing assumptions and implications…Social constructivists believe knowledge is a human product, and is socially and culturally constructed by individuals through their interactions with each other and with their environment'. One of the goals of EE/ESD is to transform society so that it develops responsible attitudes towards the environment (Fien, 1993).

To achieve this goal, schools and other institutions of learning, according to Huckle (1991) should develop three characteristics of education for the environment. Firstly, teachers should share ideas with their pupils on which forms of technology and social organisation can enable people to co-exist harmoniously with nature. Secondly, teachers and pupils should strive to democratically and reflectively transform society through the construction and reconstruction of their world. Finally, they should develop critical and active citizens who can lead to the achievement of SD. The new paradigm (methodology) should also encourage collaboration between pupils and the local community thereby solving local environmental problems, something which has been lacking in Zimbabwe since independence (Chikunda, 2007 and Shumba, et.al, 2008).

Several challenges confront Zimbabwe's EE/ESD programme as this study has shown. However, most of them are not peculiar to the country as they have been experienced in other SADC countries (Lotz-Sisitka, 2005). A major challenge is the lack of quality and relevance in most SADC EE/ESD programmes as some have been designed without implementation in mind (Molapo, 1990). According to Ketlhoilwe and Maila (2008) the goal of education should be to transform society for environmental sustainability. For example, students of EE/ESD should be trained to actively address environmental problems and challenges facing their communities. Students should also learn to cooperate with local communities in solving local problems, something which is lacking in Zimbabwe's education system (Chikunda, 2007). The overloaded curricula hinder the effective infusion of EE/ESD issues in most syllabi (Lotz-Sisitka, 2005).

Existing literature shows that environmental challenges are best tackled when schools and communities collaborate with a view to resolving them (Fien, 1993). Chikunda (2007, 161) suggests that '*Learners and the community can engage in collaborative community projects which are a response to community concerns and which engage learners in collaborative reflection and learning from direct experience. A direct result of these perspectives has been the development of action research and community problem-solving methods, amongst other action-centred methods. Environmental education further encourages interaction amongst learners, between learners and educators, and between learners and community members, in order to address local environmental issues and risks*'.

In Australia for example, schools (*teachers and learners*) have forged strong partnerships with their immediate communities in order to address local environmental challenges (Robottom, 1998). On the other hand, according to Hart (1998), in Canada, environmental stewardship has filtered down to the grassroots and will inevitably be transmitted to the next generation. These conditions are lacking in Zimbabwean and SADC EE/ESD programmes (*with the exception of South Africa*) and their absence is a threat to the achievement of SD in the long run (Lotz-Sisitka, 2005), as this study has shown. The necessary social transformation (Ketlhoilwe, 2007) is not likely to occur in the foreseeable future unless drastic measures are taken to achieve it. However, given the numerous challenges which have been exposed by this study, the future of EE/ESD in Zimbabwe and most of its SADC neighbours, is quite bleak.

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ANNEXURE SECTION

Annexure1: Interview Guide for EE Providers

Declaration of Confidentiality and Anonymity

I am a PhD student of Environmental Education at Stellenbosch University in South Africa and I am conducting a research on a topic entitled '**Zimbabwe's Environmental Education Programme and Its Implications for Sustainable Development**'. Will you kindly provide me with the necessary information? No confidential data is required and any information collected shall be kept in strict confidence to be used for academic purposes only. Anonymity is also guaranteed for the protection of your responses, views, attitudes and opinions.

1. Name of Organization or Institution--

2. Province----------------------District-----------------Area------------------------

3. Objectives of the Organization or Institution
a) --
b) ---
c) --
d) ---
e) --

4. How does your organisation define the following terms?

    a) Environmental Education…………………………………………………………………...

    b) Sustainable   Development (SD)…………………………………………………………..

    c) Environmental   Education   for SD…………………………………………………………...

5. For how long has this organization/institution been providing EE?
    a) 0-5 years□
    b) 6-10 years□
    c) 11- 20 years□
    d) 21- 30 years□
    e) 31 years and above□

6. Who are your target groups or communities?

a) Urban Areas☐
b) Rural Areas☐
c) Peri-urban Areas☐
d) All Areas☐
e) Any other (specify)------------------------

7. Which activities are you involved in?
a)--
b) --
c) ---
d)--
e)--

8. List any achievements or successes you have recorded in the past
a)--
b) --
c) ---
d)--
e)--

9. What challenges or problems have you encountered in delivering EE/ESD to your target communities/areas?
a)--
b) --
c) ---
d)--
e)--

10. Which solutions would you suggest for these problems?
a)--
b) --
c) ---
d)--
e)--

11. What else would you want to say about EE/ESD in Zimbabwe?
a)--
b) --
c) ---
d)--
e)--

End of Interview

Thank you for your cooperation

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Annexure 2: Interview Guide for Members of the Public

Declaration of Confidentiality and Anonymity

I am a PhD student of Environmental Education at Stellenbosch University in South Africa and I am conducting a research on a topic entitled '**Zimbabwe's Environmental Education Programme and Its Implications for Sustainable Development**'. Will you kindly provide me with the necessary information? No confidential data is required and any information collected shall be kept in strict confidence to be used for academic purposes only. Anonymity is also guaranteed for the protection of your responses, views, attitudes and opinions.

1. Province-----------------------District----------------Area------------------------

2. Location of Area
    a) Urban   □
    b) Rural   □
    c) Peri-urban   □
    d) Commercial Farming Area □
    e) Resettlement Area   □
    f) Any other (specify)---

3. Sex: Male □ Female □

4. Age:
a) Below 18   □
b) 18- 35   □
c) 36-65   □
d) 66 and above   □

5. Educational Level
a) None   □
b) Primary   □
c) Secondary □
d) Tertiary   □

6. Have you ever received EE?

Yes   □   No □

7. If yes, when did you last receive it?
0-5 years ago   □
6-10 years ago   □
11-20 years ago   □
21 years and above □

8. From which sources did you get it?

Primary School   □

Secondary School   □

College   □

University   □

NGOs   □

EMA   □

Any other (specify) -------------------------------

9. What issues did it cover?

a)--

b) ---

c) --

d)--

e)--

10. Did you benefit from it? Yes-----No-------

11. If yes, list the benefits

a)--

b) ---

c) --

d)--

e)--

12. If not, give reasons

a)--

b) ---

c) --

d)--

e)--

13. Which problems did you encounter in the process?

a)--

b) ---

c) --

d)--

e)--

14. Suggest possible solutions for these problems?

a)--
b) ---
c) ---
d)--
e)--

15. Can you define the following terms?

    a) Environmental   Education
       (ESD)…………………………………………………………...

    b) Sustainable   Development
       (SD)…………………………………………………………..

    c) Environmental   Education   for   Sustainable   Development
       (ESD)……………………………

16. Are EE programmes in your area oriented to the achievement of SD?

Yes………………..No……………..

17. Give reasons for your answer

a)--
b) ---
c) ---
d)--
e)--

18. What general comments can you make about EE in Zimbabwe?

a)--
b) ---
c) ---
d)--
e)--

End of Interview

Thank you for your cooperation.

Annexure 3: Questionnaire for Teachers and Lecturers

I am a PhD student of Environmental Education at Stellenbosch University in South Africa and I am conducting a research on a topic entitled '**Zimbabwe's Environmental Education Programme and Its Implications for Sustainable Development**'. Will you kindly provide me with the necessary information? No confidential data is required and any information collected shall be kept in strict confidence to be used for academic purposes only. Anonymity is also guaranteed for the protection of your responses, views, attitudes and opinions.

1. Name of Institution--------------------Province-----------------District-----------------

2. Age of institution in years
0-5   □
6-10   □
11-20   □
21 and above □

3. Your sex: Male □Female □

4. Your teaching experience in years

0-5   □

6-10   □

11-15   □
16-20   □
21 years and above   □

5. Which subjects or courses do you teach?

a)--
b) ---
c) ---
d)--
e)--

6. What is your understanding of the following terms?

  a) Environmental   Education
     (EE)……………………………………………………………..

  b) Sustainable   Development
     (SD)…………………………………………………….................

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c) Environmental Education for Sustainable Development (ESD)…………………………...

7. In your opinion, are EE programmes oriented to the achievement of SD in Zimbabwe?

Yes…………….NO…………..

8. Give reasons for your answer
a)--
b) ---
c) ---
d)--
e)--

9. Are EE/ESD included in your subject or courses? Yes------No-------

10. If yes, are they adequately covered in your subject or course? Yes-----No-----

11. If no, suggest ways of improving it
a)--
b) ---
c) ---
d)--
e)--

12. List any problems you have encountered in the teaching of EE/ESD in your subject or course
a)--
b) ---
c) ---
d)--
e)--

13. Suggest solutions for these problems
a)--
b) ---
c) ---
d)--
e)--

Thank you for your cooperation.

End of Questionnaire

Annexure 4: Questionnaire for Students/Learners

I am a PhD student of Environmental Education at Stellenbosch University in South Africa and I am conducting a research on a topic entitled '**Zimbabwe's Environmental Education Programme and Its Implications for Sustainable Development**'. Will you kindly provide me with the necessary information? No confidential data is required and any information collected shall be kept in strict confidence to be used for academic purposes only. Anonymity is also guaranteed for the protection of your responses, views, attitudes and opinions.

1. Name of Institution--

2. Province---------------------District--------------------------Area--------------------------

3. Age of institution in years---

4. Educational level offered
Secondary   ☐
College   ☐
University   ☐
Any other (specify) ---

5. Sex of pupil/student
Male   ☐
Female   ☐

6. Age in years
16-18   ☐
19-21   ☐
22 and above   ☐

7. Which subjects/courses are you doing?
a) ---
b)---
c) ---
d) --
e) ---
f)---
g)---
h)---
i)---
j)---

8. Can you define the following terms/concepts?

a) Environmental   Education
   (EE)………………………………………………………………..

b) Environmental   Education   for   Sustainable   Development
   (ESD)……………………………

c) Sustainable   Development
   (SD)…………………………………………………………..

9. In which subjects is EE included?

a)--
b) ---
c) ---
d)--
e)--

10. How is it taught?

a)--
b) ---
c) ---
d)--
e)--

11. List any problems you have encountered in the learning of EE

a)--
b) ---
c) ---
d)--
e)--

12. Suggest solutions for these problems
a) ---
b)--
c) ---
d)--
e) ---

13. Explain how EE can be improved in your school/institution
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----

14. Are EE programmes in you area oriented to the achievement of SD? Yes…….No……..

15. Give reasons for your answer
a) --
b)--
c) --
d)--
e) --

16. Suggest ways of improving them

a) --
b)--
c) --
d)--
e) --

End of Questionnaire

Thank you for your cooperation

Annexure 5: Consent to participate in research

STELLENBOSCHUNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

Zimbabwe's Environmental Education Programme and Its Implications for Sustainable Development

You are asked to participate in a research study conducted by Jemitias Mapira (PhD student), from the Curriculum Studies Department at Stellenbosch University. R*esults will contribute to research paper, thesis or dissertation.* You were selected as a possible participant in this study because it is believed that you can provide the required information.

1. PURPOSE OF THE STUDY

The study seeks to examine Zimbabwe's EE programme and its implications for sustainable development

2. PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following things:

   a) Respond to semi-structured interviews
   b) Complete semi-structured questionnaires, or
   c) Allow the researcher to examine some of your activities including non-confidential documents

These activities are not likely to take more than one hour of your time**.**

3. POTENTIAL RISKS AND DISCOMFORTS

There are no fore-see-able risks to anticipated and every thing will be done to avoid of solve them if they arise.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

As participants, you will get an opportunity to express your personal views and opinions on this topical issue (EE), which is of national interest. In this way you will contribute to national development through your suggestions and recommendations. However, your names will not be disclosed as confidentiality is guaranteed.

5. PAYMENT FOR PARTICIPATION

Your contribution is entirely voluntary and you will not be paid for it even though I will acknowledge and thank you for your time and efforts.

6. CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of safe storage of interview and questionnaire documents so that they can not be leaked to any body. Once the study has been completed, they shall be destroyed or kept in a safe place where they are not open to abuse by any body.

Information derived from this study will not include personal data. Rather, it will be in the form of descriptions and discussions so that if the results are published, they will not be identified with any of the participants.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so. [*If appropriate, describe the anticipated circumstances under which the subject's participation may be terminated by the investigator without regard to the subject's consent.*]

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact me or my supervisor, Prof. LL Grange at the University of Stellenbosch (Curriculum Studies Department).

9.   RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

The information above was described to [*me/the subject/the participant*] by [*name of relevant person*] in [*Afrikaans/English/Xhosa/other*] and [*I am/the subject is/the participant is*] in command of this language or it was satisfactorily translated to [*me/him/her*].   [*I/the participant/the subject*] was given the opportunity to ask questions and these questions were answered to *[my/his/her]* satisfaction.

[*I hereby consent voluntarily to participate in this study/I hereby consent that the subject/participant may participate in this study.*] I have been given a copy of this form.

_____
Name of Subject/Participant

_____
Name of Legal Representative (if applicable)

_____   _____
Signature of Subject/Participant or Legal Representative   **Date**

SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to _____ [*name of the subject/participant]* and/or [his/her] representative _____ [*name of the representative]. [H*e/she] was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Afrikaans/*English/*Xhosa/*Other*] and [*no translator was used/this conversation was translated into* _____ by _____].

Jemitias Mapira_____   _____
Signature of Investigator   **Date**

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Annexure 6: Interview Guide for EE Providers

STELLENBOSCHUNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

ZIMBABWE'S ENVIRONMENTAL EDUCATION PROGRAMME AND ITS IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT [consent form for EE providers]

You are asked to participate in a research study conducted by:

JEMITIAS MAPIRA–MSc (UB); BA, Grad.CE (UZ); from the Curriculum Studies Department of the Faculty of Education; at Stellenbosch University.

The findings will contribute to the writing of a PhD thesis and the publication of scholarly journal articles. You were selected as a possible participant in this study because you are a provider of EE in Zimbabwe.

10. PURPOSE OF THE STUDY

This study is designed to establish the nature of the Environmental Education (EE) Programme in Zimbabwe and its implications for sustainable development.

11. PROCEDURES

If you volunteer to participate in this study, I would ask you to do the following things:

a) To allow me to conduct a one–on–one interview with you. This would be done, preferably, on the first day after my last observations at your institution or at your convenience. The aim of the interview is to establish: your regular operations in the delivery of EE in your areas of jurisdiction, achievements you

b) have made in recent years, challenges you have encountered and how you have attempted to solve them in pursuit of the country's quest for sustainable development.

c) The interview shall, with your permission, be audio–recorded in order to facilitate the comprehension and analysis of the information generated during our interaction. This information will be transcribed and coded so that during the writing process your identity is concealed. At the same time this coding should enable me to distinguish you from the other participants in the study. The information will be kept strictly confidential and a high degree of anonymity will be ensured. You will be permitted to withdraw from the interview anytime you wish and you will not be forced to disclose information that you do not want to disclose. In the same breath, you will not be forced to respond to questions that you feel make you uncomfortable. The interview shall be conducted in English. However, you will be allowed to respond in the language of your choice. The interview shall be conducted in a place deemed comfortable by and to you and will last approximately 30 – 45 minutes.

3. POTENTIAL RISKS AND DISCOMFORTS

There are no risks associated with this study. Perhaps the interview process might make you feel a little bit uncomfortable at first. However, be assured that there is no need to panic because my interaction with you shall be both harmless and professional. My intention is not to make you uncomfortable. At the same time you have the latitude to determine the time and place for the interview, and the interview shall be terminated if you feel it is necessary to do so or if it is uncomfortable for you to go on with it.

4.POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

This study has the potential to benefit you as a participant, professionally. For example, you might gain a different perspective of how Environmental Education in your area can be improved so that it may achieve its goals more effectively than before. At the same time this study could also bring to the fore some new perspectives and challenges that the officials in your department, the politicians, the scholars and other interest groups were not aware of in respect of its implementation in Zimbabwe.

5.PAYMENT FOR PARTICIPATION

Participation in this study is both voluntary and free. Therefore you will not receive any form of payment, both financially and in kind, for your participation in this study.

6.CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of restricted access to information as well as the use of codes and pseudonyms (for example the use of names such as Respondent XX,Respondent YY, etc) when reference is made concerning the participants, their institutions, and any other person associated with their institutions. Therefore you should be assured that your identity and the matters raised by you during your participation in this study shall remain strictly confidential.

Strict confidentiality will be maintained even with regard to the documents containing the transcripts of the interviews, the observation notes and any other data generated as part of this study. All data shall be accessible only to me. This information shall be kept in a safe place under lock and key and computerised data shall be accessible through a password, only to me. However, the information gathered might be needed by my study supervisors and in this case it would have to be handed over to them. But they too are well trained with regard to rules of confidentiality and shall adhere to the code of confidentiality at all times.

You have the right to access your tape–recorded interviews and in case certain information cannot, in your view, be disclosed then that right is reserved for you. However, we (you and I) might have to interact and evaluate the need and importance of using such information in this study.

I must also mention that since this study is educational in nature, there will be a process of writing the thesis and journal articles, all of which will certainly use some of the information generated through your participation in this study. In such cases, the data generated shall still be presented in a confidential and codified fashion. There will of course be instances where some of your statements are quoted directly but these statements shall in no way identify you. Codes and pseudonyms shall still be used.

7.PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

8.IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact me:
Jemitias Mapira, PhD Student and researcher at
Stellenbosch University
Department of Curriculum Studies
Faculty of Education
RSA
Cell: 263- 0772 268 531
E–mail: jmapira2000 @ gmail.com
Or my Promoter
Professor Lesley Le Grange
Tel: 021 808 2280
Fax: 021 808 2295
E–mail: llg@sun.ac.za

9. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

The information above was described to me [……………………………………………………………..*the participant]* by [……………………………………………………………..*]* in *English/Shona/other]* and [*I am/the subject is/the participant is]* in command of this language or it was satisfactorily translated to [*me/him/her]*. [*I/the participant/the subject]* was given the opportunity to ask questions and these questions were answered to *[my/his/her]* satisfaction.

[*I hereby consent voluntarily to participate in this study/I hereby consent that the subject/participant may participate in this study.*] I have been given a copy of this form.

_____
Name of Subject/Participant

_____

_
Name of Legal Representative (if applicable)

_____   _____
Signature of Subject/Participant or Legal Representative   **Date**

SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to

_____

[*name   of   the   subject/participant]*   and/or   [*his/her]*   representative

_____

[*name of the representative]. [H*e/she] was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Afrikaans/*English/*Xhosa/*Other]* and [*no translator was used/this conversation was translated into* _____ by _____].

_____   _____
Signature of Investigator   **Date**

Annexure 7: Interview Guide for members of the public

STELLENBOSCHUNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

ZIMBABWE'S ENVIRONMENTAL EDUCATION PROGRAMME AND ITS IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT [consent form for members of the public]
You are asked to participate in a research study conducted by:
JEMITIAS MAPIRA – MSc (UB); BA, Grad.CE (UZ); from the Curriculum Studies Department of the Faculty of Education; at Stellenbosch University.
The findings will contribute to the writing of a PhD thesis and the publication of scholarly journal articles. You were selected as a possible participant in this study because you are an ordinary Zimbabwean with an interest in the country's EE Programme.

1. PURPOSE OF THE STUDY
This study is designed to establish the nature of the Environmental Education (EE) Programme in Zimbabwe and its implications for sustainable development.

2. PROCEDURES
If you volunteer to participate in this study, I would ask you to do the following things:
a) Allow me to conduct a one–on–one interview with you. This would be done, preferably, on the first day after my last observations at your institution or at your convenience. The aim of the interview is to establish: your views on the EE programme in your area, achievements you have witnessed in recent years and challenges identified in recent years.
b) Suggest possible solutions to the challenges, which have been encountered over the years in pursuit of the country's quest for sustainable development.

c) The interview shall, with your permission, be audio–recorded in order to facilitate the comprehension and analysis of the information generated during our interaction. This information will be transcribed and coded so that during the writing process your identity is concealed. At the same time this coding should enable me to distinguish you from the other participants in the study. The information will be kept strictly confidential and a high degree of anonymity will be ensured. You will be permitted to withdraw from the interview anytime you wish and you will not be forced to disclose information that you do not want to disclose. In the same breath, you will not be forced to respond to questions that you feel make you uncomfortable. The interview shall be conducted in English. However, you will be allowed to respond in the language of your choice. The interview shall be conducted in a place deemed comfortable by and to you and will last approximately 30 – 45 minutes.

3. POTENTIAL RISKS AND DISCOMFORTS
There are no risks associated with this study. Perhaps the interview process might make you feel a little bit uncomfortable at first. However, be assured that there is no need to panic because my interaction with you shall be both harmless and professional. My intention is not to make you uncomfortable. At the same time you have the latitude to determine the time and place for the interview, and the interview shall be terminated if you feel it is necessary to do so or if it is uncomfortable for you to go on with it.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY
This study has the potential to benefit you as a participant. For example, you might gain a different perspective of how Environmental Education in your area can be improved so that it may achieve its goals more effectively than before. At the same time this study could also bring to the fore some new perspectives and challenges that the officials in your area, the politicians, the scholars and other interest groups were not aware of in respect of its (EE) implementation in Zimbabwe.

5. PAYMENT FOR PARTICIPATION

Participation in this study is both voluntary and free. Therefore you will not receive any form of payment, both financially and in kind, for your participation in this study.

6. CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of restricted access to information as well as the use of codes and pseudonyms (for example the use of names such as Respondent XX,Respondent YY, etc) when reference is made concerning the participants, their institutions, and any other person associated with their institutions. Therefore you should be assured that your identity and the matters raised by you during your participation in this study shall remain strictly confidential.

Strict confidentiality will be maintained even with regard to the documents containing the transcripts of the interviews, the observation notes and any other data generated as part of this study. All data shall be accessible only to me. This information shall be kept in a safe place under lock and key and computerised data shall be accessible through a password, only to me. However, the information gathered might be needed by my study supervisors and in this case it would have to be handed over to them. But they too are well trained with regard to rules of confidentiality and shall adhere to the code of confidentiality at all times.

You have the right to access your tape–recorded interviews and in case certain information cannot, in your view, be disclosed then that right is reserved for you. However, we (you and I) might have to interact and evaluate the need and importance of using such information in this study.

I must also mention that since this study is educational in nature, there will be a process of writing the thesis and journal articles, all of which will certainly use some of the information generated through your participation in this study. In such cases, the data generated shall still be presented in a confidential and codified fashion. There will of course be instances where some of your statements are quoted directly but these statements shall in no way identify you. Codes and pseudonyms shall still be used.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact me:

Jemitias Mapira, PhD Student and researcher at
Stellenbosch University
Department of Curriculum Studies
Faculty of Education
RSA
Cell: 263- 0772 268 531
E–mail: jmapira2000 @ gmail.com
Or my Promoter
Professor Lesley Le Grange
Tel: 021 808 2280
Fax: 021 808 2295
E–mail: llg@sun.ac.za

9. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

The information above was described to me [……………………………………………………………….*the participant]* by [………………………………………………………………...*]* in *English/Shona/other]* and [*I am/the subject is/the participant is]* in command of this language or it was satisfactorily translated to [*me/him/her]*. [*I/the participant/the subject]* was given the opportunity to ask questions and these questions were answered to *[my/his/her]* satisfaction.

[I hereby consent voluntarily to participate in this study/I hereby consent that the subject/participant may participate in this study.] I have been given a copy of this form.

_____
Name of Subject/Participant

_____

_
Name of Legal Representative (if applicable)

_____   _____
Signature of Subject/Participant or Legal Representative   **Date**

SIGNATURE OF INVESTIGATOR

I   declare   that   I   explained   the   information   given   in   this   document   to

_____

[*name   of   the   subject/participant]*   and/or   [his/her]   representative

_____

[*name of the representative]. [He/*she] was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Afrikaans/*English/*Xhosa/*Other]* and [*no translator was used/this conversation was translated into* _____ by _____]*.

_____   _____
Signature of Investigator   **Date**

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Annexure 8: Questionnaire for teachers and lecturers

STELLENBOSCHUNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

ZIMBABWE'S ENVIRONMENTAL EDUCATION PROGRAMME AND ITS IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT [consent form for teachers and lecturers]
You are asked to participate in a research study conducted by:
JEMITIAS MAPIRA – MSc (UB); BA, Grad.CE (UZ); from the Curriculum Studies Department of the Faculty of Education; at Stellenbosch University.
The findings will contribute to the writing of a PhD thesis and the publication of scholarly journal articles. You were selected as a possible participant in this study because as a teacher or lecturer in Zimbabwe you should have an interest in the country's EE Programme.

1. PURPOSE OF THE STUDY
This study is designed to establish the nature of the Environmental Education (EE) Programme in Zimbabwe and its implications for sustainable development.

2. PROCEDURES
If you volunteer to participate in this study, I would ask you to do the following things:
  a) Complete a questionnaire on EE in your school, college or university. This would be done, preferably, on the first day after my last observations at your institution or at your convenience. The aim of the questionnaire is to establish: your views on the EE programme in your institution, achievements you have experienced and challenges encountered in recent years.
  b) Suggest possible solutions to the challenges, which have been identified in pursuit of the country's quest for sustainable development.

  c) This information will be transcribed and coded so that during the writing process your identity is concealed. At the same time this coding should enable me to distinguish you from the other participants in the study. The information will be kept strictly confidential and a high degree of anonymity will be ensured. You will be permitted to withdraw from participation anytime you wish and you will not be forced to disclose information that you do not want to disclose. In the same breath, you will not be forced to respond to questions that you feel make you uncomfortable. The questionnaire shall be conducted in English. However, you will be allowed to respond in the language of your choice. It shall be conducted in a place deemed comfortable by and to you and will last approximately 30 – 45 minutes.

3. POTENTIAL RISKS AND DISCOMFORTS
There are no risks associated with this study. Perhaps the process might make you feel a little bit uncomfortable at first. However, be assured that there is no need to panic because my interaction with you shall be both harmless and professional. My intention is not to make you uncomfortable. At the same time you have the latitude to determine the time and place for completion or terminate it if you feel it is necessary to do so or if it is uncomfortable for you to go on with it.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY
This study has the potential to benefit you as a participant. For example, you might gain a different perspective of how Environmental Education in your area or institution can be improved so that it may achieve its goals more effectively than before. At the same time this study could also bring to the fore some new perspectives and challenges that the officials in your area, the politicians, the scholars and other interest groups were not aware of in respect of its (EE) implementation in Zimbabwe.

5. PAYMENT FOR PARTICIPATION

Participation in this study is both voluntary and free. Therefore you will not receive any form of payment, both financially and in kind, for your participation in this study.

6. CONFIDENTIALITY

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Strict confidentiality will be maintained even with regard to the documents containing the transcripts of the questionnaire responses, the observation notes and any other data generated as part of this study. All data shall be accessible only to me. This information shall be kept in a safe place under lock and key and computerised data shall be accessible through a password, only to me. However, the information gathered might be needed by my study supervisors and in this case it would have to be handed over to them. But they too are well trained with regard to rules of confidentiality and shall adhere to the code of confidentiality at all times.

You have the right to access your questionnaire document and in case certain information cannot, in your view, be disclosed then that right is reserved for you. However, we (you and I) might have to interact and evaluate the need and importance of using such information in this study.

I must also mention that since this study is educational in nature, there will be a process of writing the thesis and journal articles, all of which will certainly use some of the information generated through your participation in this study. In such cases, the data generated shall still be presented in a confidential and codified fashion. There will of course be instances where some of your statements are quoted directly but these statements shall in no way identify you. Codes and pseudonyms shall still be used.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact me:
Jemitias Mapira, PhD Student and researcher at
Stellenbosch University
Department of Curriculum Studies
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RSA
Cell: 263- 0772 268 531
E–mail: jmapira2000 @ gmail.com
Or my Promoter
Professor Lesley Le Grange
Tel: 021 808 2280
Fax: 021 808 2295
E–mail: llg@sun.ac.za

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SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

The information above was described to me [……………………………………………………………….*the participant]* by [……………………………………………………………….*]* in *English/Shona/other]* and [*I am/the subject is/the participant is]* in command of this language or it was satisfactorily translated to [*me/him/her]*. [*I/the participant/the subject]* was given the opportunity to ask questions and these questions were answered to *[my/his/her]* satisfaction.

[I hereby consent voluntarily to participate in this study/I hereby consent that the subject/participant may participate in this study.] I have been given a copy of this form.

_____
Name of Subject/Participant

_____

Name of Legal Representative (if applicable)

_____   _____

Signature of Subject/Participant or Legal Representative   Date

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SIGNATURE OF INVESTIGATOR

I   declare   that   I   explained   the   information   given   in   this   document   to

_____

[*name   of   the   subject/participant]*   and/or   [his/her]   representative

_____

[*name of the representative]. [He*/she] was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Afrikaans/*English/*Xhosa/*Other]* and [*no translator   was   used/this   conversation   was   translated   into* _____   by _____].*

_____   _____

Signature of Investigator   Date

Annexure 9: Questionnaire for students/learners

STELLENBOSCHUNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

ZIMBABWE'S ENVIRONMENTAL EDUCATION PROGRAMME AND ITS IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT [consent form for students/learners]
You are asked to participate in a research study conducted by:
JEMITIAS MAPIRA – MSc (UB); BA, Grad.CE (UZ); from the Curriculum Studies Department of the Faculty of Education; at Stellenbosch University.
The findings will contribute to the writing of a PhD thesis and the publication of scholarly journal articles. You were selected as a possible participant in this study because you are a student/learner and as such you should have an interest in Zimbabwe's EE Programme.

1. PURPOSE OF THE STUDY
This study is designed to establish the nature of the Environmental Education (EE) Programme in Zimbabwe and its implications for sustainable development.

2. PROCEDURES
If you volunteer to participate in this study, I would ask you to do the following things:
a) Complete a questionnaire on EE in your school, college or university. This would be done, preferably, on the first day after my last observations at your institution or at your convenience. The aim of the questionnaire is to establish your views on the EE programme in your institution, achievements you have experienced and challenges encountered in recent years.
b) Suggest possible solutions to the challenges, which have been encountered in pursuit of the country's quest for sustainable development.

c) This information will be transcribed and coded so that during the writing process your identity is concealed. At the same time this coding should enable me to distinguish you from the other participants in the study. The information will be kept strictly confidential and a high degree of anonymity will be ensured. You will be permitted to withdraw from participation anytime you wish and you will not be forced to disclose information that you do not want to disclose. In the same breath, you will not be forced to respond to questions that you feel make you uncomfortable. The questionnaire shall be conducted in English. However, you will be allowed to respond in the language of your choice. It shall be conducted in a place deemed comfortable by and to you and will last approximately 30 – 45 minutes.

3. POTENTIAL RISKS AND DISCOMFORTS
There are no risks associated with this study. Perhaps the process might make you feel a little bit uncomfortable at first. However, be assured that there is no need to panic because my interaction with you shall be both harmless and professional. My intention is not to make you uncomfortable. At the same time you have the latitude to determine the time and place for completion or terminate it if you feel it is necessary to do so or if it is uncomfortable for you to go on with it.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY
This study has the potential to benefit you as a participant. For example, you might gain a different perspective of how Environmental Education in your area or institution can be improved so that it may achieve its goals more effectively than before. At the same time this study could also bring to the fore some new perspectives and challenges that the officials in your area, the politicians, the scholars and other interest groups were not aware of in respect of its (EE) implementation in Zimbabwe.

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5. PAYMENT FOR PARTICIPATION

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6. CONFIDENTIALITY

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Strict confidentiality will be maintained even with regard to the documents containing the transcripts of the questionnaire responses, the observation notes and any other data generated as part of this study. All data shall be accessible only to me. This information shall be kept in a safe place under lock and key and computerised data shall be accessible through a password, only to me. However, the information gathered might be needed by my study supervisors and in this case it would have to be handed over to them. But they too are well trained with regard to rules of confidentiality and shall adhere to the code of confidentiality at all times.

You have the right to access your questionnaire document and in case certain information cannot, in your view, be disclosed then that right is reserved for you. However, we (you and I) might have to interact and evaluate the need and importance of using such information in this study.

I must also mention that since this study is educational in nature, there will be a process of writing the thesis and journal articles, all of which will certainly use some of the information generated through your participation in this study. In such cases, the data generated shall still be presented in a confidential and codified fashion. There will of course be instances where some of your statements are quoted directly but these statements shall in no way identify you. Codes and pseudonyms shall still be used.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact me:

Jemitias Mapira, PhD Student and researcher at
Stellenbosch University
Department of Curriculum Studies
Faculty of Education
RSA
Cell: 263- 0772 268 531
E–mail: jmapira2000 @ gmail.com
Or my Promoter
Professor Lesley Le Grange
Tel: 021 808 2280
Fax: 021 808 2295
E–mail: llg@sun.ac.za

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9. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

The information above was described to me [……………………………………………………….*the participant]* by [……………………………………………………….*]* in *English/Shona/other]* and [*I am/the subject is/the participant is]* in command of this language or it was satisfactorily translated to [*me/him/her].* [*I/the participant/the subject]* was given the opportunity to ask questions and these questions were answered to *[my/his/her]* satisfaction.

[*I hereby consent voluntarily to participate in this study/I hereby consent that the subject/participant may participate in this study.*] I have been given a copy of this form.

_____
Name of Subject/Participant

_____

_
Name of Legal Representative (if applicable)

_____   _____
Signature of Subject/Participant or Legal Representative   Date

SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to _____ [*name of the subject/participant]*   and/or   [his/her]   representative _____ [*name of the representative]. [H*e/she] was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Afrikaans/*English/*Xhosa/*Other*] and [*no translator was used/this conversation was translated into* _____ by _____].

_____   _____
Signature of Investigator   **Date**