

Exploring Opportunities and Challenges for achieving the integration of Indigenous Knowledge Systems into Environmental Education processes

A case study of the Sebakwe Environmental Education programme (SEEP) in Zimbabwe.

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by
CRYTON ZAZU
606Z3197

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ABSTRACT

The role and value of indigenous knowledge systems in enhancing and contextualizing education has long been recognized (UNESCO, 1978). Against this background a lot of research focusing on the documentation and study of the world's indigenous knowledge systems, including those of Southern African countries was done. However, within the Southern African context much of this research did not translate into practical curriculum processes leaving educational processes de-contextualized (O'Donoghue, 2002; Mokuku, 2004; Shava, 2005). The linkages between the school, the home and the wider community remained weak (Taylor & Mulhall, 2001). The net effect of the limited integration of indigenous knowledge systems into mainstream environmental education processes has been that indigenous learners (such as those within the Sebakwe rural community) continued to get exposed to two different world views, the western scientific world view and the everyday life world views. The integration of indigenous knowledge systems into mainstream education such as the Sebakwe Environmental Education programme (SEEP) is one way of contextualizing education and improving its relevance to learners' socio-cultural backgrounds.

This research was conceptualized against such a context and seeks to explore the opportunities and challenges for the integration of indigenous knowledge systems into the Sebakwe Environmental Education programme. The ultimate purpose of this research is to contextualize SEEP both in its epistemology, and pedagogy.

The research was designed and conducted within a qualitative interpretive case study methodology. The methodology involved a three-phased data collection method namely document analysis, focus group interviews and an inquiry-based workshop. The data was then analyzed and interpreted in relation to a set of theoretical perspectives.

This research concluded that there is a possibility of integrating indigenous knowledge systems into the Sebakwe Environmental Education programme. Based on the findings the research came up with a list of recommendations to guide the process of working with indigenous knowledge within the Sebakwe Environmental Education programme.

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Chapter One

An orientation to the study

1.0 Introduction

This chapter seeks to provide an orienting introduction to the entire research project. It outlines the purpose, and main objectives of this research. It also discusses the context within which this research project was conducted. The context includes all the relevant background information regarding the state of affairs within the Sebakwe community and how it relates to the Sebakwe Environmental Education programme. The chapter then moves on to introduce the reader to the general structure and organisation of the research report. A brief outline of the focus of each of the six chapters that make up the entire research report is therefore given. In the same chapter, key theoretical concepts that informed the research process are briefly introduced and discussed. At the end of the chapter is a list of all acronyms used in the research report. In essence the chapter serves to help the reader get a good sense of the overall research project. It is in fact an orienting chapter.

1.2 Study purpose

I hear my students worry about how indigenous knowledges are being marginalized in the academy and about the impact that the ranking of knowledges may well have on the prospects for educational transformation and social change. (Dei 2000: p. xii)

I challenged myself to conduct this research aiming to explore the opportunities and challenges for the integration of indigenous knowledge systems, as an alternative form of knowledge, into the Sebakwe Environmental Education programme (SEEP)'s learning processes. My interest in researching indigenous knowledge and how it can be incorporated into main stream environmental education programmes emerged from the rich insights and knowledge that I gained from both reading other indigenous knowledge scholar's work and from my own personal experiences as a boy born and bred within a traditional African family context. In addition the professional experiences I have gained over the last seven years, working as an

environmental educator also helped to ignite the inherent desire in me to study indigenous knowledge systems.

Embedded in my research purpose is the ultimate goal of generating practical ideas and guidelines that could be used to promote and support the integration of indigenous knowledge systems (and achieving inter-epistemological dialogue) into the Sebakwe Environmental Education programme. It was also my conviction that inter-epistemology or knowledge pluralism within the Sebakwe Environmental Education programme was going to greatly contribute towards improving the education programme's "functional and pedagogic relevance" to the community which it seeks to help.

This particular research also emerged from the increased recognition of the potential that the integration of indigenous knowledge systems into education have in contextualizing and situating environmental learning processes (O' Donoghue & Neluvhalani, 2001). More specifically the rationale of this research was grounded in the following arguments. That;

- Within the Southern African context much of research done on indigenous knowledge systems has tended to focus on the documentation of the knowledge systems and that very few of those research efforts have translated into actual environmental education learning processes (O'Donoghue & Neluvhalani, 2001; Mokuku, 2004; and Shava, 2005). The net effect being that even up to today there is apparent marginalization and subjugation of indigenous knowledge systems within environmental education learning processes.
- Institutionalised formal environmental learning has been de-contextualised and has resulted in learners getting exposed to two worldviews; the school-based western and scientific oriented world view and the every day lived world view often ignored in contemporary environmental education programmes such as the Sebakwe Environmental Education programme. (Mokuku, 2004, p.38). Linked to this argument is the claim by Taylor and Mulhall (2001) that in order to contextualise and improve educational relevance there is need for measures to strengthen the weak linkages between the school, the home and the wider community. One such measure

is the achievement of epistemological pluralism within environmental education learning processes.

- Based on insights provided by indigenous knowledge scholars and research findings there could be as many opportunities as there are challenges inherent within the different environmental education programmes within Zimbabwe, and the Southern African region. And that research now needs to focus on how to practically integrate the documented indigenous knowledge systems into contemporary education and curriculum processes (Gough, 2002, and Shava, 2005).

These concerns shaped the developing aims of this study.

1.2.1 Therefore the specific aims of this research are to;

- ▲. Explore the opportunities and challenges inherent within the Sebakwe Environmental Education programme for integration of indigenous knowledge systems into the programme's central learning categories.
- . Generate ideas and draw recommendations that could be used to support practical integration of indigenous knowledge systems into the environmental education programme.

With the intention of;

Contextualizing and improving the relevance of both content (epistemology) and pedagogy of the Sebakwe Environmental Education programme within the context of the Sebakwe newly resettled community.

In this study I therefore had both a knowledge interest in differentiating the relation between knowledge systems and how these can be pedagogically treated as inter-epistemological processes. My assumption here is that people of the Sebakwe community have knowledge to bring to environmental learning interactions constituting the Sebakwe Environmental Education programme and that outside knowledge (western scientific) can be of benefit to them if used together with local knowledge to solve local environmental issues and risks.

1.2. 2 The Research questions

To achieve the aims of this research I worked around the following questions in relation to the Sebakwe Environmental Education programme;

1. What is main objective of the Sebakwe Environmental Education programme (SEEP)? What is the programme responding to?
2. How is this environmental education programme constituted, organized and run?
3. What are the central teaching and learning categories (learning processes) constituting the programme?
4. Which aspects, features or characters of this environmental education can be interpreted to represent opportunities or challenges for the integration of indigenous knowledge systems?

1.3 Study location and contextual framework

I carried out this research within the context of the newly established Sebakwe



Figure 1.1 Map of Zimbabwe showing the Sebakwe farming areas

communal area, where the Sebakwe Conservation and Education Centre—the organisation that runs the Sebakwe Environmental Education programme (SEEP) is situated. Geographically Sebakwe area lies east of the city of Kwekwe and is under the control of Kwekwe Rural District Council (see figure 1.1). The Sebakwe newly established farming community was born out of Zimbabwe's "Fast

Track Land Reform" programme which involved the taking of land from former white commercial farmers and redistributing it to the formally marginalised people. In terms of the agricultural regions of Zimbabwe, Sebakwe area lies in region four. The region is characterised by low rainfall, shallow soils, and a mixture of miombo and mopane woodlands. Agricultural region four (4) is comprised of areas that require very careful land use and agricultural practices such as game and cattle ranching and as well as

irrigation based crop-cultivation. The area is richly endowed with wildlife and thus is of key concern to government and other organisations with interests in environment and conservation work.

The contextual profile of the area that I carried out prior to this research project (Zazu, 2006) revealed that the Sebakwe community is faced with a wide range of environmental and health issues and risks. The issues and risks among others included;

- I. Accelerated deforestation as people open up large tracts of virgin woodlands to create crop fields and to harvest timber for construction of their huts.
- II. Massive land degradation due to soil erosion caused by unsustainable farming practices prevalent in the area.
- III. Siltation of rivers as the eroded soils and silt find their way into the small rivers and streams within the area. This has affected both aquatic life and availability of water for livestock.
- IV. Severe depletion of wildlife especially game animals which are being poached for meat and income generation.
- V. Rampaging veld fires often a result of local people's illegal hunting strategies. Local people use fire to make hunting more rewarding. The impact of these fires on the entire ecological system cannot be under-estimated.
- VI. The community also faces the challenges of not having proper water and sanitation facilities. Most of the households (as noted during the contextual profiling field observation activities) do not have pit latrines. These households use the traditional bush system to dispose human waste. Further more it was noted that there is only one village (Pauldale) with a working borehole in the entire Sebakwe area and the rest of the villages depend on open shallow wells as sources of drinking water.

In terms of educational infrastructure the Sebakwe community has three primary schools and one high school. These schools are poorly developed and very often have no adequate teaching and learning support materials. Both the teachers and

the learners are faced with a lot of challenges. These include the shortage of reading and writing materials, lack of furniture and general stationery. Due to the absence of adequate learning support materials the education standards, as testified by the national examination results of these schools, is very poor. Most of the learners can hardly converse in English even if it is unfortunately the official medium of instruction in the main stream education system of Zimbabwe.

The newly established Sebakwe farming community can best be described as a “community in the making”. This is because the area is composed of people with different cultural origins and ethnic groupings. And because of this the community represented a mixed basket of different cultures, knowledge systems and practices. Social cohesion, which depends on cultural hegemony is strikingly still in its infancy within this community.

Traditional leadership structures within the Sebakwe community are not yet clearly defined. And because the community is new not much has been achieved in terms of putting these local leadership structures in place. Typical communal or rural areas in Zimbabwe and possibly other Southern African countries have well established political, social and economical structures. The communities have clearly specified traditional and administrative structures such as village heads, and chiefs (*indunas*) and these control structures serve to regulate, among other functions, access and use of natural resources within the community. However what is only very explicit within the Sebakwe area are political structures such as the councillors. Such absence of local and traditional control structures within the Sebakwe area could, to a certain extent, help explain the unsustainable exploitation of natural resources that is being experienced in the area.

It is also important for this research to mention that, despite the cultural differences within the Sebakwe community, the contextual profile showed that the community still makes use of its indigenous knowledge systems and practices. The use of indigenous knowledge systems and practices is confirmed by the data gathered during the interviews and observations that was part of the contextual profiling process. It was observed even though not probed in detail that the community had for example high respect for certain tree species and these trees were not cut during the clearance of woodlands for crop fields. It was also noted that local people had their own ways of coping with the inherent environmental and health issues and risks.

This research project was therefore conducted within this unique context and all the issues raised have been approached in a case study research design developed in chapter three. The outcomes of the research project are thus specific to the Sebakwe Environmental Education programme and will not be generalised to any other similar education programmes.

1.3.1 My position in the Sebakwe Environmental Education programme

My position within the Sebakwe Environmental Education programme is that of Programme Manager, to whom the Environmental Education Officer (EEO) and the person in charge of the day to day management of the Sebakwe Environmental Education programme reports and from whom she gets organisational support. I am not directly involved in the Sebakwe Environmental Education programme, but being an employee of the Sebakwe Conservation and Education centre, and having worked as an environmental educator before I often found myself participating in the activities organised and taking place within the auspices of this environmental education programme. I have always wanted to be part of the education programme, and that feeling also provided motivation for me to embark on this research.

However, within the context of this research I decided to detach myself from the Sebakwe Environmental Education programme. The intentional detachment was meant to enable myself to take up a more objective vantage point for the study. According to Elias (1987, p. vii) the need to self distance oneself from the subject being studied often helps researchers to conduct research in a way that generates more meaningful knowledge claims. By consciously distancing myself from SEEP I was able to study the Sebakwe Environmental Education programme from an outsider point of view. In principle I was therefore very cautious that my involvement and interest in the Sebakwe Environmental Education programme was not going to unnecessarily influence the way the research processes (data collection, analysis, and interpretation) was going to be done.

1.4 Structure of my research report

I organised this research report into six (6) chapters. Each chapter focused on a particular stage of the entire research process. Briefly the chapters were organised as follows;

1. Chapter One: Introduction

As already pointed out in section 1.0 chapter one provided an orienting framework to the entire research project. It outlined the purpose, and objective of this research. It also briefly introduces the reader to the context of the research and key concepts used. The chapter served to help the reader get a good sense of the overall research project conceptualisation and purpose.

2. Chapter Two: Literature review

Chapter two discussed the relevant theoretical frameworks relating to indigenous knowledge and environmental education. The chapter covers the historical perspectives that have shaped and influenced people's conception of indigenous knowledge systems and how best to work with them in environmental education. The chapter is very intense and goes on to discuss some of the insights, experiences and recommendations emerging from past and previous indigenous knowledge and environmental education research. Throughout the literature review process an attempt to locate, justify and develop an argument for conducting this research were made. I needed to point out how this research relates to and differs from past and previous indigenous knowledge research projects.

3. Chapter Three: Methodology Decision

In chapter three I discussed how I planned to conduct the research. I also went on to discuss how I actually worked with the devised methodology and methods. The chapter provides very useful information relating to the process of data collection, and management, research ethics and ideas or approaches for data analysis processes (constituting a process of developing analytical memos). I closed the chapter by reflecting on the entire research methodology and how it worked out and what I thought were the lessons learnt from this process.

4. Chapter Four: Data presentation

In this chapter I moved on to analyse the data that I gathered in chapter three. So in essence the chapter is constituted by the “thick descriptions” of issues or themes relating to indigenous knowledge systems and the possibilities for its integration into the Sebakwe Environmental Education programme. The chapter is fairly detailed and provides all the relevant evidence required to answer the research questions. It was however a very important chapter because it is here where I needed to process gathered data into evidence that could be used to develop analytical statements answering the set research questions in chapter five.

5. Chapter Five: Data Interpretation

Using the processed data I moved on to interpret or search for meaning relating to the exploration of opportunities and challenges for integration of indigenous knowledge systems into the Sebakwe Environmental Education programme’ s learning categories. It is in this chapter that I made use of the theoretical frameworks developed in chapter two, and the available evidence (data) to draw conclusions responding to my research purpose and objective. The chapter therefore shares with the reader the processes that went into my data interpretation processes and the theories that I used and how I made use of them to come up with new insights (knowledge) regarding not the general field of indigenous knowledge systems and environmental education but specific to Sebakwe Environmental Education programme (SEEP).

6. Chapter Six: Conclusion and Recommendations

Since my overall goal was to come up with practical recommendations for the possible integration of indigenous knowledge into the Sebakwe Environmental Education programme (SEEP), I then in this chapter drew and outlined what I finally found to be the necessary measures to take to ensure any meaningful integration of indigenous knowledge systems into the five central learning categories that make the Sebakwe Environmental Education programme. Chapter six was therefore mainly comprised of the drawn recommendations for supporting and promoting use of indigenous knowledge into SEEP.

1.5 Clarification of key concepts

1.5.1 Inter-epistemological-dialogue

The idea of “inter-epistemological dialogue” as put forward by O'Donoghue and Janse van Rensburg (1999, p. 94) and O'Donoghue & Neluvhalani (2002, p. 126) referred to environmental education processes that articulate the interaction between different forms of knowledge systems and practices. However it is very important to note that the notion of “inter-epistemological dialogue” can be traced back to Beck (1992, p.4)'s idea of reflexive learning. Beck (ibid) advocated for learning (within a risk society) that allows for a negotiation between different epistemologies and sub-cultural forms. He was making reference to issues around the truth value of scientific propositions against the alleged irrationality of farm workers' knowledge systems (indigenous/local knowledge). Both O' Donoghue and Janse van Rensburg (1999) and O'Donoghue and Neluvhalani (2002) drew from Beck (1992) in their conceptualisation of the notion of “inter-epistemological dialogue”.

According to Beck (1992) reflexive learning herewith referred to as “inter-epistemological dialogue” can help bring together both indigenous knowledge systems and scientific propositional knowledge within the learning process. It allows for a plurality of knowledge systems within the teaching and learning processes. And such knowledge pluralism in environmental education has great potential to help contextualise and situate environmental learning processes, thus making learning more relevant to the learners (O' Donoghue & Neluvhalani, 2002).

The notion of “inter-epistemological dialogue”, as explained above was very important in this research. It provided a theoretical framework for the analysis and interpretation of data, allowing for the exploration of the possibilities for the integration of indigenous knowledge systems into the Sebakwe Environmental Education programme (SEEP).

Inter-epistemological dialogue as a theoretical framework for contemplating epistemological pluralism within education also related to other theoretical frameworks that I worked with in this research. Examples are the notion of “multiculturalism” (referred to by Agyeman (2002) in his editorial of the Canadian Journal for Environmental Education vol 7) and Cornbleth (1991)'s idea of “Curriculum in context” both of which I moved on to discuss later in this chapter.

1.5.2 Multiculturalism (knowledge pluralism)

People are the land and the land is people. We are the rivers and the rivers is us (Durie, 2004, p. 24)

Related to the notion of “inter-epistemological dialogue” that is referred to earlier is Agyeman (2002)’s idea of “multiculturalism”. The notion refers to the process of developing and implementing environmental education teaching and learning processes in a way that takes into consideration the diversity of learners’ cultural backgrounds. According to Agyeman (ibid) multiculturalism (a process of multiculturing environmental education) often provides room for cultural pluralism within environmental education processes, and can thus allow for the use of different knowledge forms. The argument is that there is a strong relationship between culture, environment, and education (Cajete, 1994). Furthermore the argument went on to claim that indigenous people had a strong unity with the environment, and that tradition was reflected through songs, customs and the subsistence approaches to healing, birthing and rituals associated with death that characterised these people’s every day life styles.

Multiculturalism advocates for rejection of separatism (dichotomisation) of knowledge forms, and emphasizes that all knowledge forms (embedded within learners’ diverse cultures) should be given equal attention in order to make learning contextually relevant. I used the idea of “multiculturalism” to probe issues around the cultural diversity of the Sebakwe community (highlighted in section 1.3) and how such findings could be either interpreted as either opportunities or a challenge for the integration of indigenous knowledge system into the Sebakwe Environmental Education programme.

Interacting with and taking this perspective allowed me to extend the idea of risk and inter-epistemological discourse into a more open-ended conception of reflexive learning. It provided insights for possibilities of a bio-cultural approach to learning within the Sebakwe Environmental Education programme. With this came the need for a contextual view of curriculum.

1.5.3 Curriculum in context

In this research I also worked with the complementary concept of “curriculum in context” (Cornbleth, 1991). According to Cornbleth (ibid, p. 24) curriculum is an ongoing social activity that is shaped by various contextual influences within and beyond the classroom and accomplished interactively by, primarily the teachers and students. That view of curriculum contrasted vividly with the technocratic view of curriculum as a product which very often unfolds in the form of a document such as a definitive syllabus of concepts to be taken into lesson planning.

Of importance to this research was the acknowledgement that context both situates and shapes curriculum and that context is more than just what is out there (Cornbleth, 1991, p. 26). Context referred to the environment in which the curriculum is playing out, but it must be noted that the environment includes the social, political, economic and demographic conditions that might, in the case of the Sebakwe Environmental Education programme, translate into challenges and opportunities for the curriculum deliberations. Curriculum in context takes into consideration both the structural and socio-cultural factors. Examples of structural factors includes things like the available educational infrastructure such as classrooms, chairs books to mention a few (like in the case of the Sebakwe community the absence of proper educational infrastructure influences the way SEEP is working). Structural factors also refer to how the teaching and learning is organised and the power-knowledge relationships amongst the different people involved. Socio-cultural factors look at issues of societal values, norms and beliefs. It relates to traditions and ideologies which need to be taken into consideration for curriculum work.

Working with Cornbleth (1991)'s view of curriculum helped me to understand SEEP as a curriculum process which can be contextualised to a certain extent by integrating indigenous knowledge systems into the programme's teaching and learning categories. The concept of curriculum as a process and on the other hand the conceptualisation of indigenous knowledge as an outcome of a dynamic system, integral to the physical and social environments of communities further helped me to develop insights into the focus of this research (Durie, 2004).

The experiences and knowledges of the Sebakwe community (gained through the contextual profile of the community in 2006) also became very useful in this research because I needed it to inform my understanding of both the structural and socio-

cultural factors of the area, and use that to appreciate some of the ideas, suggestions and views that emerged during the data gathering processes.

1.5.4 Relevance (pedagogic and functional)

The concept of relevance, as regards environmental education programmes and the associated environmental learning has been within this research defined according to Mandikonza (2006) and Zvobgo (2007), both of whom are researchers and educators in Zimbabwe.

Mandikonza (2007, p. 38) drawing from Rollnick (1998) defined “relevance” as the ability of an education to influence learners’ quality of life. He argued that relevant education should enable learners to derive learning insights and knowledge capital that might allow them to control and improve their own lives.

Zvobgo (2007) in his recently published book entitled “Re-contextualising the Curriculum: The Zimbabwean Experience” claimed that a “relevant education” is one that prepares the individual to fit and function as a member of society. He went further to point out that a relevant education serves an economic function by preparing individuals to meet the needs of the economy and society.

These two views of what might bring greater relevance to education were very important for this research as the ultimate aim of integrating indigenous knowledge systems into the Sebakwe Environmental Education programme was to contextualise and improve the environmental learning programme for the learners and the Sebakwe community as a whole.

Within this research I took the concept of relevance a step further and framed it on the basis of “pedagogic” and “functional” relevance. “Pedagogic relevance” referred to the relevance linked to the contextual teaching and learning interactions (methodologies and methods, learning support materials, and the language used) within the Sebakwe Environmental Education programme. “Functional relevance” is a term I used to refer to how useful (relevant) is the knowledge that learners gained through their participation in SEEP, in their own every day lives. According to Vandenbosch (2007) contextual interplay of content and pedagogy as implied above often offers encouraging options for contemplating and improving our education activities.

1.6 Acronyms

The following is a list of acronyms that I used within this research report and is thus provided in this chapter to act as a reference point when going through the whole research report.

AM: Analytical Memo

CAMPFIRE: Communal Management Programme for Indigenous Resources

CBD: Convention on Biological Diversity

DVD: Digitalized Video Discs

EEO: Environmental Education Officer

EEASA: Environmental Education Association of Southern Africa

EMA: Environmental Management Act

ESD: Education for Sustainable Development

DESD: Decade of Education for Sustainable Development

GoZ: Government of Zimbabwe

IKS: Indigenous Knowledge Systems

IPCC: Intergovernmental Panel on Climate Change

IUCN: International Union for Conservation of Nature

MBRC: Midlands Black Rhino Conservancy

MoESC: Ministry of Education Sports and Culture

MoET: Ministry of Environment and Tourism

NGO: Non governmental Organization

UN: United Nations

UNESCO: United Nations Education, Scientific and Cultural Organization

UNEP: United Nations Environment Programme

SARNIKS: Southern African Region Network on Indigenous Knowledge Systems

SCEC: Sebakwe Conservation and Education Centre

SEEP: Sebakwe Environmental Education programme

TEK: Traditional Ecological Knowledge

TNCs: Trans-national Corporations

WWF: World Wide Fund for Nature

1.7 Conclusion

This chapter provided a detailed overview of the conceptualization, and rationale of this research. The chapter further provided the background information and context

within which the research was designed and conducted. And from chapter one I therefore went on to search for and review literature that related to indigenous knowledge systems and environmental education. Reviewing of relevant literature was meant to help me develop further insights into the theoretical discourse and historical perspectives pertaining to advocacy and lobbying for the recognition of indigenous knowledge systems within the Southern African region, and the role these knowledge systems play in contextualizing and enhancing environmental education learning processes.

Chapter two

Literature Review

2.0 Introduction

In chapter two I challenged myself to explore the varying definitions and conceptualisations of the term “indigenous knowledge”. I review the different definitions to come up with a working definition of the term indigenous knowledge. I also discuss the historical and contextual discourses that have resulted in the current increased interest in indigenous knowledge systems among conservationists and environmental educators. Within these historical and contextual perspectives, I examined the reasons for the sudden interest in, and advocacy for strengthening indigenous knowledge systems within conservation and education.

The chapter also reviews some of the indigenous knowledge and environmental education (EE) research done within the Southern Africa region paying particular attention to the findings and recommendations that emerged from these initiatives. As a researcher, I needed to keep in my mind the fact that my research project was not a completely new endeavour but stood on the shoulders of, and drew strength from past and previous environmental education and indigenous knowledge research processes.

The literature review process helped me to gain an in-depth understanding of the factors that have shaped and influenced research in indigenous knowledge systems and environmental education processes within Southern Africa. Gaining such a good understanding of my area of research (IKS and EE) was very important as it also helped me to design the entire research project in a way that best suited the research purpose and orientation.

This chapter thus provides an orienting overview regarding the status of indigenous knowledge systems within education, the contested explanations that have developed and narratives on the integration of these knowledges into educational processes. The chapter also discussed some of the research findings and recommendations regarding indigenous knowledge integration into environmental education programmes. Throughout the chapter I made an effort to locate and situate this research project so as to develop a perspective for conducting such a project.

2.1 What is indigenous knowledge?

The term “indigenous knowledge” has recently become a popular narrative in environmental education circles. However defining indigenous knowledge (IK) and establishing working boundaries for studying the knowledge was not always an easy thing (Dei, 2002). In this research I first attempted to find out what we mean by the term “indigenous” itself and then moved on to discuss how different scholars and researchers have defined the compound term “indigenous knowledge”.

According to Cocks (2006, p. 4) the definition of the term indigenous has been problematic in many parts of the world. Within the Convention on Biological Diversity (CBD) the general consensus was that the term indigenous has been used to apply to people, as pointed out by Possey (1989);

who have historical continuity with pre-invasion and pre-colonial societies that have developed their own territories and who consider themselves distinct from other sectors of society now prevailing in those territories or part of them. They form at present non dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, their ethnic identity as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems (p. 241).

While this is not the only way of defining the term indigenous, it has become commonly used and provides a convincing vantage point. Based on the CBD conception of what the term “indigenous” means, different indigenous knowledge researchers, and scholars have defined “indigenous knowledge” in different ways.

Embedded in this conception of who qualifies to be referred to as “indigenous” is the history of colonisation, which is the most important significant experience that indigenous people share (Durie, 2004). The term “indigenous” is closely linked to colonisation, and the marginalisation of non dominant ethnic peoples by the western world. In many parts of the world that term has become synonymous with the term, “native” a colonial term that referred to, in most cases, the colonised peoples of the world. In some circles the term indigenous is highly politicised and carries a stigma that those who are referred to as indigenous take the label as an offensive one.

Working within the Convention on Biological Diversity's notion of who is indigenous, different researchers have defined indigenous knowledge in different ways. I worked with a few of these varying definitions to arrive at a conceptual framework of what the term "indigenous knowledge" referred to within the context of this research.

Antiweiler (1987) cited in Durie (2004) defined indigenous knowledge as the culturally integrated knowledge or knowledge of small, marginal and non-western groups. He argued that such knowledge is gained through the socialisation processes that occur within traditional family structures.

Working from a Southern African context O'Donoghue (1997) argued that indigenous knowledge can also be approached as the taken for granted every day common sense ways of reasoning and living, with a potential for environmental problem solving, yet confined to home contexts and hardly shared with the wider audience. Similarly, O'Donoghue and Janse van Rensburg (1999), commenting on Chavunduka (1995, p. 2)'s reference to indigenous knowledge as "African" further argued that indigenous knowledge should be seen as any responsive and sustaining symbolic capital, historically grounded and characterising a common-sense life world knowing amidst local peoples in particular socio-ecological settings around the world.

Consistent with this, another indigenous knowledge scholar from Zambia, Takawira (2002, p. 4) drawing from her experience of working with rural farmers conceptualised indigenous knowledge as the local community based knowledge that is unique to a given culture and often developed over generations. Such knowledge, she went on to point out, reflects the commonly held norms and values which shape the relationship between local people and their immediate natural world (their environment).

Dei (2002, p. 6) (one of the world's notable indigenous knowledge scholars) conceptualised indigenous knowledge as a body of knowledge associated with the long term occupancy of a certain place and is shaped by the traditional norms and social values of a given society. His definition seemed to resonate quite well with the Convention on Biological Diversity's (referred to above) notion of who is indigenous.

In a similar way, Hirji et al., (2002) defined indigenous knowledge as the development over many generations, through a traditional way of life, of an in-depth knowledge of an ecosystem or ecosystems by local people. According to Harji et al.,

(ibid) this knowledge is normally manifested through local practice, belief systems, myths, sayings and folktales among others that are built up from historical events. It is its historical nature that has it so interwoven into a society's way of life that its way of enforcement is usually fearful threats. Hirji et al., (2002) further claimed that unfortunately this type of knowledge is in many cases undocumented.

Quite recently Reid et al., (2004) argued that simply put, indigenous knowledge refers to communities' knowledge of their environments and how the ecosystems functions. Reid et al., (ibid) preferred to use the term "traditional ecological knowledge" (TEK) to refer to local community knowledge of the environment, instead of the generally used term "indigenous knowledge". His conception of indigenous knowledge was very important to this research as it directly links to the environment and the knowledge that local communities have which can be applied in environmental education processes.

A closer analysis of the above definitions led me to conclude that;

- Inherent in most of the above definitions and conceptions of "indigenous knowledge" is the issue of culture, tradition, history, and geographical position of a given community of peoples.
- Indigenous knowledge therefore appears to be the "knowledge systems" (encompassing both processes and practices) of people who have lived in a particular place over time, and have shared a common history and culture. It is knowledge that communities have gained through continuous interactions with their environment and interactions between themselves.
- It is also critical to point out that indigenous knowledge systems can neither be perceived as unique to Africa or more specifically black Africans, nor to non western people as is often misconceived by many people (Masuku, 1999). It is important to note that across the world we have diverse indigenous communities. Indigenous communities including the "Maori" in New Zealand, the "Tonga" in Zimbabwe and the "Nguni" in South Africa have their own indigenous knowledge systems. One therefore needs to be cautious and avoid falling into the trap of misrepresenting indigenous

knowledge as knowledge limited to black peoples of Africa or the non western communities of the world.

Defining indigenous knowledge from a critical and reflexive perspective helped the researcher to negotiate the often contested and sometimes politicised discourses around the debate on the value of indigenous knowledge systems in conservation and environmental education. This view was also useful in exploring issues around integration of indigenous knowledge systems into environmental education curriculum processes such as those of the Sebakwe Environmental Education programme, taking curriculum as both content and process as noted by Cornbleth (1991).

Finally I also needed to emphasise that my interest in indigenous knowledge was not developed through a sense of cultural marginalisation of indigenous knowledges and knowledge communities, but an interest in the possibilities of intergenerational knowledge having a key role in helping to contextualise and situate environmental education learning processes (O'Donoghue et al., 2006). This study was therefore neither geared towards equalising western scientific knowledge systems with indigenous knowledge systems nor elevating one form of knowledge over the other, but sought to explore how the different epistemological traditions could be used to enrich environmental learning processes in a given context of socio-ecological risk, in this case the Sebakwe context.

I therefore decided that within this research, the term “indigenous knowledge” was going to be used synonymously with terms such as “local knowledge”, “community knowledge”, “traditional knowledge” and “traditional ecological knowledge”. All of the above terms loosely defined referred to knowledge in local communities (people) about their everyday lived experiences, their local environment included.

Further more the term indigenous knowledge systems was used, within this research, to refer to the content (facts), processes (methods) and practices (application) relating to indigenous communities, their knowledges, the intergenerational mechanisms and the associated every day practices.

2.2 Why was there a sudden interest in indigenous knowledge systems over the last three decades?

There are many stories and explanations relating to why people the world over started to develop interest in indigenous knowledge systems. These stories certainly differ and not any one of them can claim to be the absolute truth. However some of these stories relate to one another and as such can be used in combination to shed more light into the increased recognition of the potential that indigenous knowledge systems have in helping communities to attain sustainable livelihoods. In this section I share with you the three main stories (theoretical perspectives) that could help one to understand and appreciate the changing trends in the way people work with and perceived indigenous knowledge systems.

2.2.1 Failure by Science to provide adequate answers to the global environmental crisis.

Dei (2000) argued that the recognition of the not “always” best impacts of scientifically informed solutions to environmental problems forced people to reconsider indigenous knowledge as an alternative. Reid et al., (2004); Mokuku (2004); and Shava (2005) concurred with Dei (ibid) when they pointed out that the current renewed interest in indigenous knowledge has been as a result of increasing lack of confidence in western science as a response to the world’s worsening environmental problems.

Shiva in Dei et al., (2000, p. viii) highlighted using examples of use of western scientific methods of agriculture i.e. use of pesticides, how the world was beginning to question the impact of western scientific knowledge as a response to the different local and global ecological problems. Shiva (ibid) argued that western scientific knowledge systems have failed the world and instead have created more problems than solutions. Shiva’s argument concurred with Beck (1992)’s claim that the current global environmental crisis was a product of technological advances that characterise modern societies.

Odora (2002 cited in Shava 2007) and Le Grange (2004) took the story further and claimed that western science failed to provide answers to all environmental problems that the world is faced with, hence the need to consider other knowledge forms when dealing with environmental issues and risks.

Commenting on the need to incorporate indigenous knowledge into mainstream environmental education processes Agyeman (2002) pointed out that western or conventional models of environmental education have more often than not failed to address cross-cultural issues. Agyeman (2002)'s point was that in environmental education, teaching and learning is expected to include activities that are by, with, or about indigenous (local) peoples their environments and the people's relations to the living and non living things around them. Reid et al., (2004) echoed the same sentiments.

Embedded within the above arguments is the fact that across the world there is a strong realisation that western science and modern environmental conservation sciences have failed to provide adequate solutions to the worsening local and global environmental issues and risks. It looks like people have begun to ask more seriously, questions about why the global environmental crisis has continued to worsen in the face of increased western scientific knowledge and technological advancement. It is within such as a context that even quite recently the Intergovernmental Panel on Climate Change (IPCC) called for Africa to consider going back to its indigenous knowledge systems and practices in order to help the continent cope with the impacts of climate change ("United Nations urges Africa to act on climate change", 2007). The recognition of the shortfalls of western science and technology to help local people cope with environmental vulnerability can help us to appreciate why all of a sudden a lot of people are going back to the use of traditional medicines, foods and even energy and agricultural technologies.

2.2.2 A struggle for intellectual freedom

On the other hand the renewed interest in indigenous knowledge as an alternative to western scientific knowledge seemed to have emanated from the fact that across the world "indigenous" people themselves have now realised how their own knowledge practices have been marginalised, subjugated and dominated by western scientific knowledge systems (Dei, 2002, p. xiii). In support of this argument Dei (2002) claimed that:

Indigenous knowledges are emerging in the present day as a response to the growing awareness that the world's subordinated peoples and their values have been marginalised...by the rise in influence of western industrial capital (p. 6).

Concurring to the above view May and Aikman (2003, p.139) further argued that the call for recognition and respect for indigenous knowledge is also situated in relation to larger indigenous struggles for democracy, social justice and self determination. In the increasing prominent way indigenous peoples worldwide have been in the fore front in arguing for better treatment, recognition of and restitution for historical injustices and more broadly the recognition of self determination.

Linked to the explanation of marginalisation of other knowledge forms by the western scientific knowledge systems is what Foucault (1989) termed “knowledge power relationships”. According to Foucault (ibid) what counts as knowledge and not knowledge depends on which knowledge form is more powerful than the other. Therefore the marginalisation and subjugation of indigenous knowledge systems by dominant western scientific knowledge systems was linked to the struggle for power (embedded in colonialism) that the western world enjoyed over the other ethnic minority peoples of the colonised world.

Shiva (1993) quoted in Dei, et al., (2002) also provided us with more insight into the origins of this skewed knowledge power relationship when he pointed out that colonialism has from the very beginning been a contest over the mind and intellect. She asked two very important questions, firstly *what will count as knowledge?* And *secondly who will count as expert or innovator?* (Emphasis mine). These two questions were central to the project of colonizing diverse cultures and their knowledge systems. Both Foucault (1989) and Shiva (1993) cited in Dei et al., (2002)’s theoretical perspectives provided deeper historical insights into the contemporary renewed interest in indigenous knowledge systems. And from these insights I could deduce that other than the recognition of the failure of western scientific knowledge systems to provide all answers to the worsening global ecological crisis, the debate on the need to recognize and incorporate indigenous knowledge systems into contemporary environmental management and ultimately environmental learning processes was being actively and very often emotionally advocated for by the indigenous people themselves as a form of fight for intellectual liberation. This perspective helped the researcher to understand the oppositional phenomena that have characterised earlier research and conceptualisation of indigenous knowledge systems, a dialectic that is not particularly helpful when it comes to education as it involves the rejection of one or the other and does not allow one to see the possibility that at the engagement of diverse knowledge systems is

the prospect of a reflexive education process of situated socio-ecological (bio-cultural) learning for sustainability.

2.2.3 Indigenous knowledge as an economic venture

Reid et al., (2004, p.240) alerted me to a third dimension to the renewed interest in indigenous knowledge systems. He argued that the renewed interest in indigenous knowledge was also linked to the economic interests of large commercial organisations (also known as trans-national corporations - TNCs). Across the world these large commercial organisations are investing in research on indigenous knowledge, for instance studies on indigenous knowledge systems pertaining to exploration of medicinal properties and uses of certain indigenous wild plants species, not because this knowledge need to be shared within the local communities but because of the potential that the knowledge and its application have in terms of commercial and profit making ventures. This third dimension to renewed interest in indigenous knowledge may not relate directly to the focus of this research but have varied implications for indigenous knowledge research. Notably this explanation provides useful insights into the plethora of indigenous knowledge research projects that have also become so popular over the last three decades. It also did help me to appreciate the possible hidden motives behind corporate sponsorship of some of the indigenous knowledge research projects.

Most importantly this explanation was very useful as it can also be used to trace and understand issues around appropriation of knowledge systems, issues around monopoly of knowledge and copyrights related matters that have also been part and parcel of the entire discourse of what is valid knowledge, how is it generated and best represented and who owns it.

In concluding this section I acknowledged that historically there could be many other theoretical perspectives and explanations to the current renewed interest in indigenous knowledge systems within conservation and education but I found the three views, namely;

- I. increased recognition of how western science has failed to provide all answers to environmental problems,
- II. the realisation by indigenous people of their marginalisation and subjugation by the western powers, and

III. the economic interests of TNCs) outlined above as adequate and relevant for informing this project,

My overall impression was that the same stories are just told differently but boil down to the same substance. However it is important to note that explanations linked to the current debate on the importance of indigenous knowledge in environmental management and also in environmental education processes remain highly contested because people's conceptions and appreciation of these knowledge systems and how important they vary from one person to another.

2.3 Historical perspectives influencing indigenous knowledge and environmental education.

The debate on the value and role of indigenous knowledge systems and practices in biodiversity conservation has been going on for a long time (Cocks, 2006). This debate has been influenced and continues to be determined by wide ranging and varying factors. For the purpose of this research I decided to discuss some of the key historical events that can be linked to the recent interest and advocacy for use of indigenous knowledge systems in both conservation and environmental education work. I approached this discussion at two levels.

First I discussed some of the global events and processes that could have led to the recent increased recognition and acknowledgement of the need to incorporate indigenous knowledge systems into conservation and education processes. Secondly I highlighted the latent manifestations (implications) of those international initiatives and processes within the Southern African region with a vision to ground and justify the objective and purpose of this research project. For each of these levels of explanation I made reference to the changes in perception, and approaches to researching and working with indigenous knowledge systems that came along with the historical events and initiatives.

2.3.1 From the global perspectives to local manifestations.

Internationally multilateral environmental agreements such as the 1992 Convention on Biological Diversity (CBD), the NGO Forum's Treaty also of 1992, and Agenda 21 which is a blue print for achieving environmental sustainability, acknowledged and

provided for respect, preservation and maintenance of knowledge innovation, and practices of indigenous and local people who are following their traditional lifestyles. (Zimbabwe. Ministry of Environment and Tourism, 2003, p. 22). In addition to these international perspectives international conservation and education bodies such as the Worldwide Fund for Nature (WWF), International Union for the Conservation of Nature (IUCN) and the United Nations Education, Scientific and Cultural Organisation (UNESCO) also upheld and supported advocacy for need to respect and consider indigenous peoples and their diverse knowledge systems in both conservation and environmental education processes (Reid et al., 2004).

Over arching the above referred to international advocacy (and movements) for increased recognition of indigenous knowledge systems was the Draft Declaration on the Rights of Indigenous Peoples (which was presented to the UN for ratification in 1993), which made the contemporary relevance of indigenous knowledge more explicit (Durie, 2004). Article 14 of the declaration focuses on the right to revitalise, use, develop, and transmit, to future generations, histories, language, philosophies and intellectual pursuits. The declaration had and continues to have great influence on the current indigenous knowledge work, even within the Southern African region.

As the international community and organisations called for respect of indigenous knowledge within conservation and education, a number of regional and country based policy and advocacy initiatives regarding indigenous knowledge systems were also taking place. World bodies such as WWF, IUCN and UNESCO all with major interest in conservation and education started to invest into policy advocacy and research aimed at studying the world's diverse indigenous knowledge systems with a view to enhance conservation and education. Such research and policy advocacy undertakings were usually done through regional networks and regional and local advocacy bodies, in the case of Southern Africa, the Environmental Education Association for Southern Africa (EEASA) played a critical role. The association working in partnership with various regional and national institutions of higher learning promoted research that resulted and contributed greatly to the current status of indigenous knowledge systems within the education and conservation fields. Much of such research revealed that indigenous knowledge systems had the potential to enhance both conservation and education processes (Mokuku, 2001).

Africa and Southern Africa also became increasingly involved in indigenous knowledge research. And to date a lot of work has been done and is being done to

research and document indigenous knowledge systems within the region (O'Donoghue & Neluvhalani, 2002). The Southern African Network on Indigenous knowledge Systems (SARNIKS), formed in 1996 was part of the region's efforts to promote indigenous knowledge research (Le Roux, 1999). Part of SARNIKS's work, other than to promote the documentation of the indigenous knowledges, was to explore how these knowledge systems can be used in environmental education processes. Part of this research's strength is drawn from this argument.

Interest in indigenous knowledge systems and how it can be used in conservation and environmental education processes also resulted in a plethora of policy and research initiatives at country level. Within the Zimbabwean context, the National Environmental Education Policy (Zimbabwe, MoET, 2003) launched in 2004 placed a lot of emphasis on the need for environmental education to support, research in and use of indigenous knowledge systems. The policy statement is representative of the international call and advocacy for respect and use of the world's different indigenous knowledge systems within both conservation and environmental education processes. (See appendix, 2.1). In Zimbabwe the net effect of both international and national policy advocacy for recognition and use of indigenous knowledge systems played out in the form of policy formulations such as the National Environmental Education policy as well as research and curriculum initiatives aimed at opening up space for the inclusion of indigenous knowledge systems within mainstream education. The same can be said about other Southern African countries.

Therefore what has resulted in increased interest and recognition of indigenous knowledge systems today is grounded in the international and local policy and advocacy processes. In different country contexts things played out differently.

2.3.2 Indigenous knowledge and environmental education: The overview.

In a slightly different perspective and with particular relation to environmental education the need to value the role of "local knowledge", "traditional knowledge", or "every day knowledge" (all termed indigenous knowledge in this research) in environmental education processes can be tracked back to the 1977 Tbilisi conference which formulated the twelve principles for Environmental Education (UNESCO, 1978). The Tbilisi principles of environmental education had embedded in them, perspectives that called for the recognition of learners' diverse socio-cultural backgrounds (their knowledge systems included) and historical contexts. The Tbilisi principles also acknowledged that learners do bring into the learning processes their

own contextual experiences of the lived world, which environmental educators needed to consider (Le Roux, 1999, p.15). And because the Tbilisi principles were globally binding in nature and received a lot of recognition and respect from environmental education practitioners, its advocacy for the need to embrace issues of diverse cultures and knowledge forms greatly influenced and shaped much of the current debate and work in indigenous knowledge systems and environmental education. Across the Southern African region the influence of the Tbilisi principles is conspicuous and seen in how education policies are framed. In Zimbabwe, as has already been alluded to in section 2.2.1, the Tbilisi principles are represented within the National Environmental Education policy (NEEP)

Research in indigenous knowledge and how it could be integrated into environmental education processes as pointed out earlier in this chapter was also given impetus by the NGO Forum's Treaty of 1992. Principle 7 and 9 of this treaty was very influential in shaping and promoting research in indigenous knowledge and environmental education.

Principle 7 stated that environmental education must recover, recognise, respect, reflect and utilise indigenous history and local cultures, as well as promote cultural, linguistic and ecological diversity (ICAE, 1993 cited in O'Donoghue & Neluvhalani 2002, p. 123).

Principle 9 argued for the need for environmental education to value all the different forms of knowledge that learners bring into learning processes. The reason being that all knowledge is diverse, cumulative and socially produced (ICAE, 1993, p. 123). This principle was so important in that it resisted the idea of monopolisation of knowledge forms as is unfortunately the case in many educational contexts across the world.

Related to the increased interest in indigenous knowledge systems within the environmental education was work done by a number of indigenous knowledge scholars and researchers. Internationally work done by notable researchers such as Shiva (1993); Dei (2000, 2002); Odora Hoppers (2001, 2002); Gough (2002) and Le Grange (2004) have had quite a great influence in giving momentum to research into indigenous knowledge systems. Their works continue to be referred to in most current research projects such as this particular one. These education researchers contributed greatly to our current understanding of the discourse and history around

the revaluation of indigenous knowledge systems within environmental education and conservation programmes. Further more work done by these researchers has also helped contemporary researchers like me to better understand the evolution and involvement that indigenous knowledge systems, as a form of knowledge and way of knowing has undergone over the past three decades. Most importantly these researchers provided very convincing insights into some of the reasons that actually have resulted in the recent call for recognition of indigenous knowledge in both conservation and education. These insights were critical to this research and served to guide me as I carried out this research.

Within the Southern African region, work done by environmental education practitioners and indigenous knowledge researchers like Fien (1993); Mtshali (1994); Masuku (1999); O'Donoghue, and Van Rensburg (1999); Mokuku (2004); Neluvhalani (2004); and Shava (1999, 2000, 2005) have also greatly contributed to our current understanding and appreciation of indigenous knowledge systems and how these can be integrated or applied in environmental education processes. Research by Mtshali (1994), Masuku (1999), Mokuku (2004), and Shava (2000 & 2005) all pointed out to how contemporary environmental education processes is de-contextualized resulting in learners getting exposed to two world views (the school curriculum world view, which is oriented around science and concepts, and the home every day world view which is often ignored by the school system that is centred on a delivery of scientific concepts). The de-contextualisation of learning processes were as a result of the apparent marginalisation of indigenous knowledge systems within most of the environmental education programmes in the region. Such research findings implied that there is therefore urgent need for concerted effort to ensure that environmental education processes (both content and process) are re-contextualised and situated to suit learner's socio-cultural backgrounds. It was such research findings and conclusions that have justified the rationale for conducting this research to explore for opportunities and challenges for the integration of indigenous knowledge systems into the Sebakwe Environmental Education programme.

Environmental educators such as Asafo-Adjei (2004); Kota and Hanis (2006) and Mandikonza (2007) have recently gone beyond research just focusing on documentation of indigenous knowledge systems, towards the exploration of the actual application, incorporation and or integration of indigenous knowledge into environmental education learning processes. Their work and research findings were also very important to this research.

2.4 Past environmental education research: What has already been said?

In this section I discuss a few examples of the indigenous knowledge research done within the Southern African region with an aim to explore and critique the knowledge claims made, conclusions reached and recommendations put forward regarding indigenous knowledge systems and how it can be used in environmental education processes. The process of drawing and learning from previous education researchers or research work with similar interests to mine enabled me to approach this research with an informed frame of mind within which I could explore the opportunities and challenges for the integration of indigenous knowledge systems into the Sebakwe Environmental Education programme. As has already been said I needed to remember that this Sebakwe research is not the first of its kind and in actual fact will become part of an already existing body of indigenous knowledge systems and environmental education research.

Masuku (1999) did great work, working with indigenous knowledge stories and exploring how such knowledge systems can be used to strengthen environmental learning on water issues. Her research formed part of early research initiatives aimed at the actual investigation of how indigenous knowledge systems could be used in environmental education. In her research Masuku (1999, pp. 104-106) among other conclusions and recommendations, claimed that;

- Issues around indigenous knowledge are complex and often multidimensional. Her explanation was that people's understanding and appreciation of what indigenous knowledge is and how this knowledge can be used in education vary, as already pointed out from place to place.
- Environmental educators need to apply different teaching and learning approaches to help learners explore issues around their own indigenous practices and ways of knowing.
- There is need for resource materials developers to consider carefully how to incorporate local communities' knowledge systems when designing and producing learning support materials for use in environmental learning processes

- There is also urgent need for environmental educators to dispel the misconception that indigenous knowledge is limited to black African peoples. As stated in section 2.1 this misconception is usually embedded in the way people conceptualise the term indigenous knowledge.

Research done by Masuku (1999), even if it was not on the same case study (education programme) with this research, provided very useful insights into some of the existing tensions and difficulties surrounding indigenous knowledge and environmental education research within Southern Africa. Masuku (ibid)'s research did not provide answers to my research questions but oriented me to the kinds of findings and possible conclusions associated with research relating to indigenous knowledge and its integration into environmental education processes.

Another environmental education practitioner and indigenous knowledge researcher, Shava (2000) engaged in research on indigenous knowledge of wild food plants in the Eastern Cape province of South Africa and provided equally very useful findings and recommendations to this research. In that research he pointed out that there is an urgent need for more research into indigenous knowledge systems, as most of these knowledges risked getting lost, given the collapse of inter-generational knowledge transfer mechanisms that are linked to the impact of westernization on traditional African cultures and traditions.

The same researcher, Shava (2005, p. 78) claimed that even if there has been substantial progress in documenting indigenous knowledge systems in Zimbabwe, its application or use in environmental education was strikingly lacking and where attempts have been made the integration had been very superficial. Shava (2005) had this to say in support of his observation;

Within the formal education system in Zimbabwe, based on the available books and the school curricula integration of indigenous knowledge into formal education seems superficial...aspects of indigenous knowledge mainly used to enrich the dominant western knowledge systems (p.78).

Shava (2005) went on to argue that indigenous knowledge is still marginalised in Zimbabwe's education system. He recommended that where integration is made it should be *clearly* indicated that this is indigenous knowledge. Whilst I agreed with Shava that indigenous knowledge is still marginalised within the Zimbabwean education system I did not share with him the notion that its integration needed to be

hierarchical or dichotomised, as implied by his call for a clear labelling of knowledges. Doing so would mean that indigenous knowledge scholars in their unconscious obsession with indigenous knowledge rejuvenation could be making the same mistake of dichotomising knowledge forms that modern education systems have done. Moreover pushing for the promotion of indigenous knowledge systems to a higher level than western scientific as might be implied in Shava (2005)'s argument might not be ideal for countries like South Africa and Zimbabwe where the school systems are now multiracial, and multicultural. Masuku (1999) working with Agrawal (1995)'s ideas concurred with the point I raised that the labelling of knowledge as either indigenous or western scientific that most indigenous scholars tended to do is problematic and has varied implications.

In a research paper on "Indigenous knowledge and Wild Food Plants among Zimbabwean's urban and rural communities" Shava (2005) came up with suggestions on how indigenous knowledge on wild food plants could be incorporated into the different learning subjects constituting Zimbabwean's national curriculum. Drawing from research done by Asafo-Adjei (2004), Shava (ibid, p. 79) suggested that;

- Indigenous knowledge on wild food plants can be used in subjects such as Agriculture, Food and Nutrition, Geography and Science. He gave examples of how indigenous knowledge on wild food plants can be used by learners when discussing or learning about the nutritional value of food substances, or when learning about the propagation of plants within Agriculture as a subject area,
- The integration of indigenous knowledge into environmental education processes should involve the inclusion of traditional methods of teaching and learning which are mostly oral in nature. Such traditional methods of teaching and learning included folklores, ceremonies, songs and proverbs and idioms.

In agreement with Shava (2005), Agyeman (2002), in his editorial of the Canadian Journal of Environmental Education (CJEE) volume 7, pointed out that environmental educators must not just educate in a culturally appropriate way, but rather in a culturally inherent way, employing indigenous ways of teaching and learning, including ceremonies, dreams, visions, and visioning, fasting, story telling, learning by doing, observation, and reflection. Such an approach allows learners not only to

share in a culturally inherent manner, but to also reinforce the concept that indigenous knowledge is not only content but also process.

Agyeman (2002) advocated for what he called “multiculturalism” in Environmental Education. Multiculturalism or cultural pluralism in environmental education, he went on to claim can help to situate learning because it takes into consideration cultural backgrounds of all learners, an issue which I considered critical in a country like Zimbabwe where classes are quite often made up of children from different socio-cultural backgrounds. Such an approach to learning has potential to contribute to the process of promoting epistemological pluralism within environmental education learning processes such as those that constitute the Sebakwe Environmental Education programme.

Mokuku (ibid) studying the role of indigenous knowledge systems in biodiversity conservation among communities in Lesotho put forward a number of suggestions for the integration of indigenous knowledge systems into mainstream environmental education processes. He claimed that formal education usually suffers a set-back of being out of context thus resulting in “de-contextualised” learning. Mokuku (ibid) spoke of the two world views that indigenous learners are made to experience at school and at home. He argued that indigenous learners do not often see sense in what they learn at school because what is learnt in the schools is divorced from their every day lived experiences. As one of his concluding thoughts Mokuku (2004) then called for more research into exploration of how indigenous knowledge systems, representing learners’ lived experiences and purposeful knowledge capital could be incorporated into education. Like other indigenous knowledge researchers and environmental educators his concern was that of contextualisation of education to suit learners’ socio-cultural orientations. Even if Mokuku (ibid) did not provide me with specific and pragmatic guidelines for how educators could best work with indigenous knowledge systems his research findings were of key significance because they served to justify the purpose and focus of this research project.

Working within a South African context, and researching and writing on various aspects of indigenous knowledge, O’Donoghue and Janse van Rensburg (1999) explored the idea of inter-epistemological dialogue between different knowledge forms within environmental education processes. The idea of inter-epistemological dialogue has already been explained in detail in section 1.5.1 in chapter one.

In his recent work O' Donoghue (2002) gave examples of how concepts such as water collection, storage of grain, and fermentation of "amasi" (sour milk) can be discussed with learners in an inter-epistemologically oriented manner, where the indigenous wisdom communicates and complement with western scientific knowledge propositions. He suggested that the knowledge that learners have gained from their own socio-cultural experiences, such as the making of *amasi* could be carried into the formal curriculum where a link between the concept of fermentation (as scientific and propositional knowledge) can be related to learners' every day purposive knowledge. While the idea of inter-epistemological dialogue was not really a research finding it was very important in this research because it provided a theoretical framework for the interpretation of data and the generation of conclusions within this research project.

In subscribing to the idea of inter-epistemological dialogue Gough (2002) cited in Reid et al., (2004, p. 238) claimed that traditional ecological knowledge (another term relating to indigenous knowledge) is neither irrelevant to nor incompatible with, modern scientific worldviews and paradigms that informs the dimensions of science and science education in what is constituted as western scientific environmental education. Hence it is ideologically and probably practically possible to have within the teaching and learning processes, a combination of two or more epistemologies interacting with one another. Such an idea may have great implications for both content and the teaching and learning methods or approaches used within education programmes.

Sithole (2004, p. 5) echoed the same sentiments when he argued that scholarship is a half way mark between indigenous perspectives and science, and that both knowledge forms must exist within the education system without any apologies. What seems to be emerging from O'Donoghue et al., (2002); Gough (2002) and Sithole (2004) is that there is need for education to move away from the false dichotomy of knowledge systems typical of modern educational institutions back towards a plurality which gives respect to different knowledge forms (Shiva in Dei et al., 2002, p. viii).

Quite recently O' Donoghue et al., (2007) raised our attention to the need for environmental education processes to allow for learners to use their own mother tongue languages as a way of helping them to discuss their own lived experiences and the history that shaped those experiences. Use of mother tongue languages, O'

Donoghue et al., (ibid) further argued, allows for social mediation in context that recognise cultural diversity. Allowing learners to engage in discussions around local environmental issues and risks, within environmental education processes, therefore has potential to contribute to the integration of indigenous knowledge systems and the related indigenous ways of teaching which is the focus of this research.

Elias (1998, p. 232) explaining why different knowledge forms need not be viewed as separate or one more superior than the other (as is or was the case between science and indigenous knowledge) said that “knowledge comes from social experience and scientists are not value-neutral as they are affected by their personal wishes when studying nature. Scientific enquiry thus embodies sets of values and is not very distinct from everyday life knowledge and experiences. In agreement with Elias (1998)’s view, Sithole (2004, p. 4) reiterated that the notion of science versus indigenous knowledge is a false opposition as all knowledge has indigenous origins. Echoing the same sentiments Hyed (1996) cited in Elias (1998) argued that not all that is western is scientific nor all that is science is western. Therefore the separation of knowledge systems (that multiculturalism rejected) is really baseless as all knowledge is knowledge and belongs to the world enterprise.

In closing the discussion on what other researchers have said, in relation to indigenous knowledge and possibilities for its integration into education I needed to continue reflecting on the fact that even if there was an explosion of interest in indigenous knowledge among environmental educators within Southern Africa, not much that was tangible was achieved and little out of all the research and translated into curriculum perspectives and learning support materials (O’Donoghue 2002, p.123).

What was therefore needed was context-specific research exploring and generating recommendations and guidelines for the integration of indigenous knowledge systems into environmental education learning processes. Again it was against such a background that I challenged myself to carry out this research with the intention of making meaningful contribution to the processes of achieving epistemological pluralism within the Sebakwe Environmental Education programme. The ultimate goal being to contextualise both the content and pedagogy of the education programme through what May & Aikman (2003) called the incorporation of a dynamic and ongoing process of cultural negotiation, rather than a simple return to or retrenchment of past or present knowledge systems and practices

2.5 What are the already known opportunities and challenges for integration of indigenous knowledge into environmental education processes?

From the diverse range of research and reports done on indigenous knowledge systems and practices within Southern Africa a wide range of ideas and insights, regarding opportunities, and challenges for how best to work with indigenous knowledge in environmental education emerged. In section 2.4 I concentrated on highlighting relevant and major research findings and theoretical frameworks relating to indigenous knowledge and environmental education. In this section I moved a step further to focusing on what past and previous researchers and scholars claimed to be some of the issues standing for or against efforts to integrate indigenous knowledge systems into contemporary environmental education processes.

On its own this section of literature review, I must mention, did not also provide any answers to my research questions but provided me with relevant and rich insights into what is already known, and which may or may not directly relate to the challenges and opportunities for working with indigenous knowledge systems within the Sebakwe Environmental Education programme.

2.5.1 What are some of the general opportunities?

o Enabling policy frameworks

Le Roux (1999) commenting on how indigenous knowledge can be used to strengthen environmental education processes draws our attention to the Tbilisi principles for Environmental Education (UNESCO-UNEP, 1978) which advocated for perspectives that embrace culture and history. She argued that within the framework of the Tbilisi principles for environmental education there is room for teachers to incorporate indigenous knowledge systems and practices into their conventional environmental education processes. This is basically because the Tbilisi principles form the organising framework or basis for much of today's environmental education processes. Much of the environmental education projects, even here within Southern Africa, as already been highlighted in section 2.2.1 and 2.2.2 are working within the five objectives and twelve principles of environmental education as stipulated by the Tbilisi conference.

Therefore in general (and not yet in the case of Sebakwe Environmental Education programme) the presence of enabling policy frameworks has already been concluded to present an opportunity for environmental educators to achieve real progress in terms of integrating indigenous knowledge systems into their environmental education teaching and learning processes.

o **The Broader concept of the “Environment”**

Le Roux (1999) also argued that the integration of indigenous knowledge into environmental education processes could be made possible if teachers work within the broader concept of the environment as proposed by O'Donoghue and Janse van-Rensburg (1995). The broad concept of the environment encompasses interactions between the biophysical, economic, political, and social dimensions, which when unpacked could help educators to bring indigenous knowledge perspectives into environmental education processes. Related to this avenue for the integration of indigenous knowledge into environmental education, was Grass (1996)'s argument that content (meaning the subject matter or the issues being discussed) in environmental education should be influenced by and taught from multiple cultural perspectives. It thus remains possible that working within the broader concept of the “environment” educators can explore social, political and cultural matters influencing local environmental issues and risks, and in doing so making environmental education processes multicultural and creating more space for application of indigenous knowledge systems into the teaching and learning activities.

o **Open-inquiry and participatory teaching methodologies**

Masuku (1999) also drew our attention to the work of Fien (1993) which can be used to open space for the inclusion of indigenous knowledge in environmental education processes. Fien (1993) advocated for an open-enquiry based teaching and learning that takes into consideration the community at large. According to Fien (ibid) it is the gap between formal and less formal, community and school knowledge as separate learning environments which are not interactive, that stands in the way to sustainable living. Fien (1993)'s argument was supported by Taylor and Mulhall (2001)'s claim that what makes learning de-contextualised (in both content and pedagogy) was the weak linkages between the school, home and the wider community. In a slightly related conception Masuku (1997) cited in Masuku (1999) further argued that use of indigenous knowledge in environmental education is empowering. She claimed that when teachers work with local and familiar issues, e.g. their own indigenous ways of preserving food, or conserving water, they become more confident. From these

perspectives, it emerged that the use of open-inquiry and participatory teaching methods has the potential to create room for the integration of different knowledge systems into education.

o **Sources of indigenous knowledge systems**

Another perceived opportunity for integration of indigenous knowledge that both Mokuku (2001) and Shava (2005) referred to is the rich cultural heritage that is still available within Southern Africa. In terms of sources of indigenous knowledge systems the two researchers claimed that there are still quite a good number of community elders who are repositories of the knowledge systems and practices that have shaped the life styles of the different indigenous peoples of Southern Africa. These repositories of indigenous knowledge systems and practices together with already documented indigenous knowledge learning resources constituted a good opportunity for educators considering incorporating indigenous knowledge into their every day teaching and learning processes. Indigenous knowledge systems learning support materials are available and can be accessed from resource developers, such as Share Net in South Africa.

o **Decade of Education for Sustainable Development (DESD)**

In 2005 UNESCO launched the decade for Education for Sustainable Development (2005-2014). Of importance to the focus of this research, is the fact that one of the framing principles of Education for Sustainable Development (ESD) is cultural diversity including respect for indigenous and other forms of traditional knowledge (Lotz-Sisitka, 2004, pp.48-49). Therefore the launch of the decade for Education for Sustainable Development provides a solid basis for more research on indigenous knowledge and also presents an array of opportunities to educators who want to integrate indigenous knowledge systems into the teaching and learning processes. Working within the framework of education for sustainable development environmental educators has a chance to achieve epistemological pluralism that may help to bring indigenous knowledge systems into dialogue with the currently dominating western scientific knowledge propositions.

2.5.2 What are some of the general challenges?

o **Persistent dominance of Western Scientific knowledge**

Despite its apparent merits indigenous knowledge as either a concept or body of knowledge has not yet received complementary status to western science (Bowers, 2001). However education systems in most Southern African countries despite gaining independence have remained westernised (Zvobgo, 2007). For instance in Zimbabwe the national education system has remained westernised and put very little emphasis on indigenous knowledge systems and practices (Mandikonza (2006). And because of the western scientific orientation of the education system in Zimbabwe indigenous knowledge is also not recognised within the national examination procedures. The resultant effect is that many educators and learners are forced to look down upon their own traditional knowledge systems and practices. Bowers (2001) further argued that indigenous knowledge has been viewed as not necessarily meaningful in terms of the prevailing ways of organizing learning e.g. subject based didactic approaches, thus its use or integration in environmental education processes is hugely challenged, given the skewed relationship between national education systems and the various environmental education programmes.

o **Self Validating reductionism**

Sibanda (1998) researching within Zimbabwe claimed that many local people (referring to the Tonga people of Binga area) treat their own culture, knowledge and traditions as inferior to the western knowledge systems. Sibanda (ibid) went on to point out that within the Tonga community, most young people now then believed that there is little value in their own knowledge and have fully embraced western knowledge systems. Such a situation stands out as a drawback for working with indigenous knowledge in contemporary education settings.

What Sibanda observed was also alluded to by Le Roux (1999) who made reference to the idea of “self-validating reductionism” as put forward by Weston (1996), which might have influenced indigenous people themselves to disvalue their own local knowledges and practices. According to Le Roux (1999) integration of indigenous knowledge into formal environmental education suffers the setback of indigenous peoples themselves not accepting that their own knowledge is useful because through mechanisms of colonialism the local knowledge systems were labelled valueless.

o **Social Habitus**

Le Roux (1999) also drew our attention to Bourdieu's notion of "social habitus", which could help explain why environmental educators tended to resist changes such as the bringing in of new forms of knowledge and ways of teaching into their every day learning processes. Very often the notion of social habitus culminates into a situation where educators fear to do things differently because doing so would imply dragging themselves out of their comfort zones. It thus requires a very daring educator to put effort to apply indigenous knowledge into environmental education given the fact that the educators are used to working with western scientific knowledge systems.

o **Lack of interest in indigenous knowledge systems**

In formal education, use of indigenous knowledge e.g. of wild food plants, could be difficult due to the lack of interest in indigenous knowledge among the young generation (Matowanyika, 1991; Mtshali, 1994 and Shava, 2005). This lack of interest and negative attitude, that is common among most youth, may be linked to lack of intergenerational knowledge transfer within today's indigenous communities, changes in life styles that have taken place since the colonisation of Africa, and impact of western formal education systems (Shava, 2005, pp.78-79). Changes in life styles when considered against the fact that indigenous knowledge tends to be based on cultural stability, present any environmental educator seeking to integrate indigenous knowledge into his or her teaching and learning, with a big challenge.

o **Marginalisation of local languages**

WWF (2000) cited in Reid (2004, p.24) highlighted how the subjugation and marginalisation of indigenous languages in formal environmental education have made it difficult for any meaningful integrating indigenous knowledge systems into formal teaching and learning to be achieved. According to Reid et al., (2004) indigenous knowledge accumulated by indigenous people comes to be embodied through language, and significantly language extinction, or marginalisation may leads to loss of the accumulated knowledges, given that much of indigenous knowledge systems are passed on to the new generation orally. The challenge has been therefore that how could educators work well with indigenous knowledge within an education system where English is the only official medium of instruction. And because in most Southern African countries English is the dominant language used in education, the marginalisation of indigenous languages has been known to be one of the challenges for successful integration of indigenous knowledge into education.

o Cultural distribution of knowledge

On a different note Shiva (1993) highlighted the issue of cultural distribution of knowledge within traditional societies which had also been interpreted to act as a drawback for the integration of indigenous knowledge into formal environmental education processes. Shiva (ibid) claimed that in traditional societies knowledge is distributed according to gender and stereotypes. Women possess a set of knowledge that men may not have. Young boys were taught certain things that young girls needed not to learn. Accordingly such stratification of traditional societies contrasted hugely with today's modern world and modern school set up. In today's schools and environmental education processes learners are all expected to learn the same things and in the same way. Attempting to bring in indigenous knowledge into education therefore requires much more thought than is anticipated. This stratification of societies and distribution of knowledge was therefore pointed out as one of the real dilemmas faced by teachers in some contexts regarding indigenous knowledge systems and practices and how to incorporate them into classroom discourse.

2.6 Conclusion

As mentioned in the introduction (see section 2.0) this chapter sought to provide in depth information regarding indigenous knowledge systems and environmental education. The chapter provided a detailed account of the historical perspectives that influenced and shaped the debate on the need to recognise and use indigenous knowledge systems and practices into both conservation and education settings. It also provided room for the locating and justification of this particular research project.

From the process of reviewing relevant literature and gaining a deeper understanding of issues around the integration of indigenous knowledge systems into environmental education processes I then moved on to the stage of data collection (research methodology) which is reported in chapter three.

Chapter 3

Research Methodology

The world is subjectively structured, possessing particular meanings for its inhabitants (Cohen et al., 2000 p. 187)

3.0 Introduction

In chapter three I discussed issues around the design and methodology employed to conduct this research. The chapter provides information on how I planned to carry out this research, and how the actual research processes unfolded. As reflected in chapter one this chapter also outlines some of the theoretical perspectives influencing the research design and methodology decisions. An argument for using an exploratory interpretive case study approach for this research is therefore given.

The chapter discusses in detail the three main data generating methods, namely document analysis, focus group interview, and the workshop processes that were used to generate data for analysis. For each data collection method reference was made to the sampling techniques employed, the participants involved and the constraints encountered. Issues to do with how I approached matters regarding research ethics, validity and trustworthiness are also covered.

An overview of how I worked with the data (data management) is also given close to the end of this chapter and the chapter closes with some reflections and lessons learnt from the research design and methodology processes.

3.1 The Research Methodology

I decided to conduct this research within a qualitative interpretive research framework. The research design and methodology involved a three-phased data collection framework. Document analysis constituted phase one, focus group interview phase two, and a workshop formed the third and final data generation phase. In line with the purpose (explore opportunities and challenges for integration of indigenous knowledge systems into environmental education processes) and design of this research all the three data phases had a qualitative orientation (Terre Blanche & Durrheim, 1999, p. 6; and Connole, 1993). The use of qualitative research methods was critical because within this research I needed to develop deeper insights and understanding of the Sebakwe Environmental Education programme's

teaching and learning categories in order to be able to identify some of the possibilities for the inclusion of indigenous knowledge systems into the programme's learning interactions. I also needed a research design and methodology that allows me to interact with the research participants in a natural and unobtrusive manner in order to get in-depth data (Research Methods and Techniques Module, 2001, p. 73).

An interpretive case study method that generated qualitative data was thus used to conduct this research. This research design and process recognized that as a researcher I had to work with people (project staff, learners, teachers, community elders and curriculum specialists) in order to understand how they perceive and interpret issues around indigenous knowledge and how it could be integrated into environmental education programmes (Cohen et al., 2000). The information I needed to gather to be able to answer the set research questions required that I use qualitative instead of quantitative data collection methods.

It was also important to use a qualitative case study methodology because of its ability to help a researcher to conduct research within context, and thus develop real experience of how the Sebakwe Environmental Education programme is structured, organized and run. Such real experiencing of the case study programme was key to this research project's intention of exploring how indigenous knowledge systems could be incorporated into the programme's teaching and learning programmes.

3.2 The Case Study method

The use of a case study method as a framework within which this research was carried out was also justified by its relation to the nature and purpose of the research. Use of a case study method arose out of the researcher's desire to probe and gain a deeper understanding of a complex social phenomena, such as the learning categories (and interactions), that constituted the Sebakwe Environmental Education programme (Jan van Rensburg, 2001). And since this research is of an exploratory interpretive nature, it was important for me to use a research approach, such as the interpretive case study method which acknowledges that social science research produces multiple accounts (Terre Blanche & Durrheim, 1999). Such thinking was very important as the case study of indigenous knowledge systems in the Sebakwe Environmental Education programme had to be seen against the insights provided by case studies of other contexts of indigenous knowledge and environmental education. In essence it therefore meant that the insights and

knowledge claims generated from this research could be seen in relation to the insights and findings of other research projects. Such is the nature of case study methodology because each case is viewed as a unique situation that can each be read to derive insights into the social phenomenon in question.

According to Bassey (1999) a case study has the potential to help a researcher to explore in-depth (because it often concentrates on only one case) socially complex phenomena, such as how people perceive and conceptualize their own learning processes and the different epistemological systems that are embedded within the learning itself. Furthermore Patton (1980) argued that case studies are particularly useful where a researcher wants to study a particular group of people, a specific process or a unique situation in great depth. Such was the case for this research because it intended to focus attention on the Sebakwe Environmental Education programme as a unique teaching and learning process playing out within the context of the newly established Sebakwe community in Zimbabwe.

Robson (1993, p. 40) defined a case study as the development of detailed knowledge about a single “case” or a small number of related “cases”. He pointed out that the case study research method is of particular interest to a researcher wishing to gain a rich understanding of the context of the subject being researched. Janse van Rensburg (2001, p. 16) concurred with Robson (ibid) when she argued that the case study method enables a researcher to look at individual or small groups in a naturalistic setting, and be able to generate rich and detailed qualitative data on a phenomenon of interest.

3.2.1 Classification of the case study methods

Bassey (1999, p.75) described a case study as the study of a singularity which is chosen because of its interest to the researcher. Bassey (ibid) identified three categories of educational case studies as;

- Theory seeking and theory testing case studies
- Story telling and picture-drawing case studies
- Evaluative case studies (also referred to as exploratory by Yin, 2003).

Yin (1994) in a similar classification of case study methodologies, pointed out to the variations within case study research frameworks. He classified case studies into three categories namely;

- o Multiple case studies (comparative),
- o Qualitative or quantitative case studies
- o Evaluative (exploratory) case studies.

I chose an exploratory (evaluative) case study format because the purpose of this research was to explore the challenges and opportunities for the inclusion of indigenous knowledge into the Sebakwe Environmental Education programme's teaching and learning activities. Exploratory case studies are a valuable means of finding out what is happening in order to seek new insights and clarify one's understanding of a problem or process (Robson, 1993, p.42). The exploratory case study framework related very well to the data generation methods, in this case the document analysis, focus group interviews with programme stakeholders, and the workshop in chapter three.

As I have already outlined earlier on in this chapter the data was generated in three phases. Diagrammatically this took the shape of a pyramid with each segment of the pyramid representing a data generation level. The diagram below (see figure 3.1.) is a representation of the data generation process and also acts as a summary of the process.



Document analysis as a technique for generating data around a particular focal concern helped me to gain first hand insights into the background, purpose, structure and organization of the Sebakwe Environmental Education programme.

Three documents (which form the basis of the Sebakwe Environmental Education programme) were identified and analyzed. These were;

- I. The Sebakwe Conservation Education Centre's information brochure (SCEb) - which spells out the purpose and objectives of the environmental education programme and the central learning categories through which the set objectives are achieved.
- II. School Camp programmes (SCp) - which give more details on the organization and structure of learning categories for school children when they come for environmental camps conducted within the auspices of Sebakwe Environmental Education programme. The camp programmes provided rich data pertaining to how learning is organized and taking place within the education programme. It represented the curriculum processes taking place within the Sebakwe Environmental Education programme.
- III. Learning support materials (LSM) - often used in the central learning categories. The researcher carried out a quick scan of the range of LSM materials used to support learning within SEEP and then focused on the two commonly used learning support materials namely the "Enviro-picture building game" called Malusuthe's farm, developed through Share-Net and the "wildlife wall sheets" produced by ACTION which is a leading environmental and health learning support materials developer in Southern Africa.

In addition to providing the researcher with deeper insights into how learning is structured and organized within the Sebakwe Environmental Education programme the analysis of the documents also helped me to start identifying areas or issues relating to the research purpose and questions that needed to be probed further in the second data generation phase -the focus group interviews. The analyzed documents were later, within this chapter, coded for purposes of easy data management.

3.3.2 The Focus Group interview

According to Schurink (1998) a focus group interview is described as a purposive discussion of a specific topic or related topics taking place between eight and ten individuals with a similar background and common interest. Focus group interview is a form of interview involving open discussion between specifically selected persons.

I conducted one focus group interview involving five programme staff, and three local school teachers. The focus group interview provided a time and cost effective means for collecting qualitative data in a situation where a one-shot collection was

necessary (Berg, 1998). I managed, through the focus group interview to generate diverse and relevant data from different research participants.

To ensure that qualitative data was generated in as an open-ended and deliberative way as possible I organized the focus group interview in a way that;

- o A democratic and enabling environment was provided to promote active participation by all the invited participants. I emphasized from the onset of the discussions that each participant has a right to be heard and to be given time to speak out. I was very careful about how I distributed time for participants to respond to questions.
- o A flexible or semi-structured interview schedule was used, again to allow for deeper probing and discussion of unforeseen issues (see appendix 3.1). Very often the participants brought in issues that were not quite directly linked to the research focus but room was given for such issues to be discussed because I knew that from such issues useful insights could be developed regarding the education programme and how the teachers, learners and community perceive it. Most of the questions discussed during this focus group interview came from the observations and insights that I had gained from the (document) analysis of the school camp programmes, some of the learning support materials being used to support environmental learning, and the Sebakwe Conservation Education centre information brochure.

A purposive sampling process (also referred to as selective sampling) was used to identify the focus group interviewees (Patton, 1990). Patton (ibid, p. 169) argued that the logic of purposive sampling lies in selecting information-rich cases for study in depth. The implication of Patton (1990, p.169)'s argument was that I needed to think critically about the people that I was going to work with as research participants. It was very important to carefully identify research participants with greatest potential to provide the in-depth and relevant data regarding the focus of this research project.

3.3.2.1 Focus group interview participants

The following is a brief introduction to the participants in the focus group interview. All of them were chosen on the basis of either their common interest; involvement and experience of working with Sebakwe Environmental Education programme or their social status in relation to the focus of my research e.g. senior and elderly teachers are perceived as potential repositories of indigenous knowledge with the potential of generating rich data on the research interest.

- I. **Mr. Mugwidi** - a local school teacher who has been heavily involved in SEEP since the programme's inception in 2004. Other than working closely with SEEP, Mr. Mugwidi had vast experience working with similar environmental education projects, such as the Wildlife Society of Zimbabwe's Kwekwe Environmental Education programme, Schools and Colleges Permaculture programme (SCOPE), and Action 21 environmental programme. In addition Mr. Mugwidi has shown over the years that I have known him, great interest in indigenous knowledge systems. In the many bush camps and teachers' workshops that he has attended, he has openly advocated for the promotion of traditional methods of conserving natural resources in the current education system. It is for his vast experience in environmental education work and his interest in indigenous knowledge systems that made Mr. Mugwidi an invaluable participant in this research project.
- II. **Mr. Matarirano** - was of a very similar background to Mr. Mugwidi. He was an elderly senior primary school teacher, who had also been working with the Sebakwe Environmental Education programme for close to three years now then. Also very important to this research focus is the fact that other than being a school teacher Mr. Matarirano was also a traditional village head back in his home area of Zhombe, lying about 100 km west of the newly established farming community of Sebakwe. Therefore besides bringing in his educational experiences and insights, into the focus group interviews Mr. Matarirano also brought in very important information regarding indigenous knowledge systems. He seemed very knowledgeable about issues around indigenous knowledge and how it related to environmental conservation and education.
- III. **Mrs. Chinogwenya** - a middle aged female school teacher who despite her few years participating in SEEP activities had shown great interest in both

participating in the programme and also improving the programme's relevance to the community it seeks to help. Being middle aged I also felt that her presence and views were going to serve as check points for the other two elderly teachers who might, because of age and traditional background, end up reifying indigenous knowledge instead of being critical and come up with insights into how both indigenous knowledge and western scientific knowledge can inter-epistemologically interact within the Sebakwe Environmental Education programme.

IV. **Palloma Pachiti**- was the day to day officer, or coordinator in charge of Sebakwe Environmental Education programme. She has been with the programme since 2004 and over the past three years she has been directly responsible for the planning and organization of the environmental education activities (learning categories) of SEEP. Palloma has a natural sciences background and no formal training in education. Her views and ideas concerning the integration of indigenous knowledge into SEEP were very critical. I worked with her as a colleague and so in the focus group interviews I wanted to elicit her inner views and deeper thoughts about the focus of this research and how it was going to contribute to the functional and pedagogic relevance of the programme in relation to its context (both the community profile and the national education vision for the country)

V. **Lorraine Mpunzi, Darlington Mazara, Carvin Dzoro and Sethukile Sibanda** – all of them were university students on attachment with the Sebakwe Conservation Education Centre, where they were conducting research covering a diverse range of environmental conservation and wildlife management issues. All of these students had been with the Sebakwe Environmental Education programme for at least one year and part of their duties were to help run school environmental camps. They helped with the planning of the learning activities and they often prepared and presented lectures during school camps. So their short experience with the education programme and their being university students researching on environmental issues was also important to this research as they acted as, arguably both objective sources of insights, and representatives of the young generation's perspectives on the need to integrate indigenous knowledge systems into environmental education programmes such as SEEP.

In total eight people participated in the focus group discussion and all of them participated actively and contributed quite substantial information and insights on indigenous knowledge and its integration into environmental education programmes.

Data generated during the focus group interview was captured by way of brief notes. I later on elaborated on the brief notes in my research journal. Over and above generating deeper insights into the opportunities and challenges for the integration of indigenous knowledge systems into the Sebakwe Environmental Education programme, the focus group interviews provided a mechanism for the triangulation of data gathered through the document analysis.

In data generation I differentiated the focus group from the workshop as the latter was more open-ended and worked with data generated in the earlier phases of the research.

3.3.3 Workshop

According to Lupele (2003) workshops have recently become a very useful data collection tool in educational research. A workshop involving purposively selected research participants formed my third and final data generation activity. In order to generate rich qualitative data the workshop was organized and designed to be inquiry-based (Fortino, 2002) cited in Lupele (2003). Just like the focus group interview the workshop needed to allow for deeper probing of emerging issues and this implied that an enabling environment was set to allow for maximum participation of all the involved research participants.

The following were categories of participants invited and involved in the workshop;

1. All the eight people who had participated in the focus group interview (for triangulation and deeper probing of data generated in the interview),
2. Two local community elders, one of them being the local councilor for ward one in which the Sebakwe farming area lies,
3. A representative from the Better Environmental Science Teaching programme (BEST) – an outcome of Zimbabwe's effort to implement chapter 36 of Agenda 21,

4. A representative from the Curriculum and Quality Assurance department of the local ministry of Education, Sports and Culture.

Therefore in total thirteen (13) people including the researcher participated in the workshop. I had to work with such a small number of participants so as to allow for more dialogue and more in-depth engagement with issues around the opportunities and challenges for the integration of indigenous knowledge into the Sebakwe Environmental Education programme teaching and learning categories. In addition I made sure that all the invited participants got clear information concerning the agenda of the workshop so that they could bring in more ideas and perspectives about the issues scheduled for discussion. The inclusion of the two local community members, and officials from BEST and ministry of education brought into the discussions very rich insights regarding indigenous knowledge systems, and contemporary education processes.

The workshop served two purposes. Firstly it generated new and very valuable data relating to the focus of this research. Secondly the workshop provided a means for triangulating data that had been generated through the first two phases of the data collection process. Such ongoing and reflexive triangulation of data within the research processes contributed to the trustworthiness and validity of this research (O' Leary, 2004).

Data generated during the workshop was recorded in note form. A research assistant was engaged to help ensure that all the important and relevant data was captured. The captured information was later elaborated on and compiled into a comprehensive workshop case record. In addition to the written records photographs of the workshop proceedings were also taken.

3.4 Research Ethics

Taking ethical issues and working with them carefully is a very important aspect of social science research (Cohen et al., 2000). And because communities, organisations and individuals have a sovereign right to retain or share, as they see fit, their knowledge and opinions their informed consent was considered a very critical ethical matter (Kuiper, 1995, p. 45). Issues around ownership of the records of utterances and actions (hiding participants identities or not), and permission to publish the case report (copyright issues relating to participants recorded actions or

photographs) were handled carefully (Bassey, 1999). Respect for democracy and respect for the person as argued for by Bassey (ibid) also called for great attention from the researcher. In this research informed consent was achieved by;

- o Being honest about the research purpose, its design and implications for participating in it. For all the data collection processes I made sure that I clarified, to all prospective participants the purpose of this research, and the processes involved. For both the focus group interviews and the workshop, participants filled in a group consent form. (See figure 3.2 and appendix 3.1). The consent form was filled and signed after I had fully explained to the participants the purpose and processes for this research.

Group Consent and Agreement of confidentiality form This form is intended to ensure that all the participants of this research project have been given adequate information on the purpose of, and on the implications of participating in, the research entitled; <u>Exploring opportunities and challenges for achieving the integration of indigenous knowledge systems into Environmental Education processes: A case study of the Sebakwe Environmental Education programme (SEEP) in Zimbabwe.</u> I hereby sign this form to indicate that I have freely agreed to participate in this research project. I further promise that I will not use the data generated in this research for any other purpose other than this research or discuss the data with anyone outside my fellow focus group or workshop members and the researcher All the invited participants are hereby asked to read and sign this form indicating that they have agreed to comply. Name _____ Signature_____
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Figure 3.2 Adapted from Berg (1998, p. 115)

- o It was also critical that I informed the research participants of the possible benefits and implications (*principle of beneficence*) of participating in this research project. According to Makore-Rukuni (2001, p. 30) the merit of a research design and outcome must be in benefiting the participants. That is what I wanted to take care of.

- o For each data collection method I asked the participants for their opinions regarding the use of their real names or pseudo– names in the research report. I emphasized that as participants they were very free to make a choice that suit themselves and their role in the research project.
- o I also paid attention to issues like, respect for democracy, respect for truth, and respect of the person (Bassey, 1999, p. 74) by making sure the organization and running of the focus group interviews and the workshop allowed for freedom to be heard and to speak one's mind. In all the interactions with research participants I was very alert and cautious not to limit participants thinking and engagement with issues being discussed, by either making the atmosphere autocratic or by imposing my own personal ideas on the participants.

3.5 Data management

According to Huberman and Miles (1994, p. 428) data management refers to the operations a researcher needs to undertake to achieve a systematic and coherent process of data collection, storage and retrieval. There are many ways of approaching data management within a research context. In this research project I worked with two distinct data management theoretical frameworks.

I borrowed Bassey (1999)'s idea of formulating a “case record” of the research. And in practice this meant that I needed to archive all the generated data systematically together in series or a research journal. I developed a research case record in my laptop and created a file for each data category. But most importantly I also developed a back up of the research case record in form of hard copies printed or photocopied and stored in separate envelopes). All the original scripts, in their natural state, photographs and other forms of data were kept for future reference. Put together the files (the hard and soft copies) of research data constituted my research journal and made it easier for me to retrieve the data whenever needed.

I also used O'Leary (2004)'s model of data management which emphasises the need to keep the whole research project in mind throughout the research journey. (See figure 3.3 below).

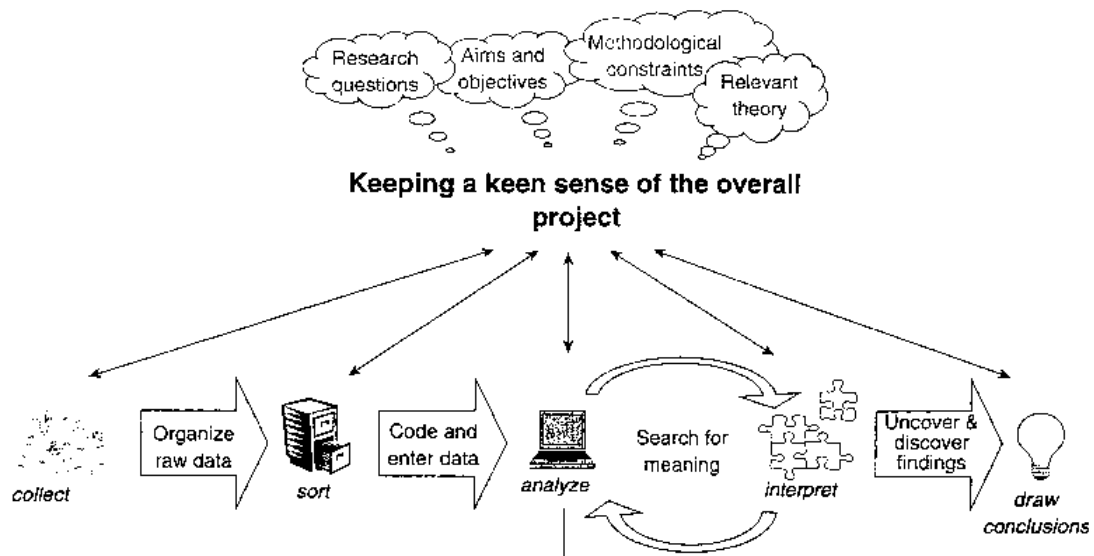


Figure 3.3: Data management process flow diagram (Adapted from O'Leary, 2004, p. 184)

The implication of working with O' Leary (2004)'s notion was that I had to ensure that as I collect, process and interpret data, I keep in mind the overall purpose and objectives of this research project. Such an approach to working with data was critical because it helped me to keep focused and to be able to judge and distinguish relevant from irrelevant data.

I went on to devise a coding system for all the three data collection phases and the participants involved. Coding all the participants made it easier to trace data (during data analysis and interpretation) to its sources during the analysis and interpretation stage of this research. The following coding system was used;

📁 **DGph1: Document analysis**

- o SCECb
- o SCp1, and SCp2
- o LSM 1: Environ-picture building game
- o LSM 2: Wildlife wall sheets (posters)

📁 **DGph 2: Focus group interviews**

- o T1, T2, and T3 (T: teacher)
- o S1,S2, S3, S4 and S5 (S: staff)

DGph 3: Workshop Discussions

- o LC1, LC2, (LC :Local community elder)
- o S1w, S2w, S3w, S4w and S5w
- o BEST
- o T1w,T2w and T3w
- o MoESC1

Key for using the codes are;

DGph: Data generation phase 1, 2 or 3

BEST: Better environmental Science teaching

T1.., T5: Teacher one –teacher three

MoESC: Ministry of Education Sports and Culture

S1.., S5: Programme staff one-five

LSM 1, 2: Learning support material one and two

SCECb: Sebakwe Conservation Education Centre information brochure

SCp1 and 2: School camp programmes one and two

Coding and classifying raw data into categories like this provided me with a good basis upon which I started the data processing and analysis (Terre Blanche and Kelly, 1999). It also helped me to keep track of data for purposes of being reflexive. In addition to working with the codes highlighted in this section I also organised my data into categories or thematic frameworks. I came up with these categories on the basis of my research focus and questions. The following categories were used;

1. Structure and organisation of learning within SEEP
2. SEEP and the teaching and learning methods used
3. Learning support materials (LSM) and SEEP
4. Language used within SEEP and Indigenous knowledge systems
5. Knowledge systems (content) and SEEP
6. Aspects of SEEP representing opportunities and challenges for integration of indigenous knowledge systems

These categories or themes were formulated to communicate to the purpose and objective of my research. And in chapter four, I used them to present the data that I had generated within the data collection processes. The same themes were also carried over (even if I rephrased some of them) through to chapter five in which I was trying to interpret the research data and process it into evidence that I could use to make a meaningful conclusion and put forward recommendations to guide the process of integrating indigenous knowledge systems into the Sebakwe Environmental Education programme.

3.6 My reflections on the research methodological processes

During the course of working with my research methodology there are quite a number of things that I learnt and which I think needed to be reflected on. Some of these are;

- a. Very often things don't play out as one would have planned and so one needs to be very reflective of the entire research project in order to remain on track and focused.
- b. It is important in research to keep thinking about your research purpose and research questions during the course of data collection as not doing so might result in you collecting irrelevant data.
- c. One needs to have more than one way of doing things say in terms of recording data in case one method fails. I planned to record the workshop discussions using an audio tape but I experienced a power cut on the day of the workshop so I ended up resorting to note making and photography as a way of recording data.
- d. It is very often difficult to engage research participants meaningfully in topics such as indigenous knowledge and environmental education. In my case most of my research participants had very little working knowledge of what the term indigenous knowledge refers to, so I had to give a briefing in both the focus group interview and the workshop before further discussions. That helped to ground the interview and workshop processes but it might have also influenced the direction the discussions took and the nature of the answers I got from the participants.

- e. Ethical considerations need to be taken seriously especially when one is working with a group. I resorted to having focus group and workshop participants signing a group consent form after realising that it was very time consuming to get each of the participants signing a separate form. It however may inhibit the same idea of independent informed consent as asking research participants in the presence of their colleagues whether they consent to participating in the research was somehow restrictive. Furthermore I had problems with how to reduce effect of power gradient between myself and SEEP programme staff who all answer to me hierarchically within our organisation. In as much as I tried to humble myself I still strongly feel that my being their senior and boss influenced their consent to participate in the research project.

3.7 Conclusion

This chapter has outlined my research methodology and how I worked with it. In chapter four I will take a careful look at how I presented and analysed the data that I generated in this chapter. As I move on to chapter four I needed to remain reflexive in order not to lose track of the rich experiences and rich insights that have started to develop, regarding the opportunities and challenges for the integration of indigenous knowledge into the Sebakwe Environmental Education programme. Keeping a sense of the overall research project as I move from one chapter to another served to increase the trustworthiness of my research conclusions (O'Leary, 2004).

Chapter Four

Data presentation and analysis

4.0. Introduction

In this chapter I am going to outline the processes that constituted the data analysis stage of this research project. The chapter therefore provides a detailed account of the theoretical frameworks that I used to inform and guide the data analysis process. The theoretical frameworks used related to the post positivistic nature and orientation of qualitative interpretive research, such as this project.

From the discussion of the theoretical frameworks employed this chapter goes on to make a careful presentation of the generated data, making the data ready for interpretation. The data presentation and analysis was done on the basis of the coding frameworks outlined in chapter three. This chapter as already mentioned was so interlinked to chapter three. Using the codes and themes outlined in chapter three (see section 3.6) I developed thick descriptions and analytical memos, representing processed data (making it evidence upon which knowledge claims could be made).

4.1 Theoretical Frameworks for Data analysis

I worked with data using two data analysis theoretical frameworks. The two theoretical frameworks served to guide both the data analysis and interpretation processes as in many cases the two processes are closely intertwined and are often done concurrently (O' Leary, 2004).

4.1.1 "Thick Descriptions"

Firstly because this research was qualitative in orientation I used Geertz (1973) cited in the Sage Dictionary of Social Research (2006)'s notion of "thick descriptions". And what it implied was that I had to develop "thick descriptions" of the qualitative data that I had generated through the document analysis, focus group interviews and the workshop conducted. Accordingly much of this chapter is a representation of thick descriptions of the issues emerging from the data collection and relating to the focus of this research project and the specific questions as outlined in chapter one. Each of the themes or issues that emerged from the data collection process linked to the

possibilities of integrating indigenous knowledge systems into the Sebakwe Environmental Education programme is described in detail. And that constituted quite an important part of the data analysis within this research project. The thick descriptions were very important as they allowed me to process data into meaningful evidence that I used in the data interpretation stage.

4.1.2 Reduction and Interpretation

I also used Marshall & Roman (1989) cited in Creswell (1994, p. 114)'s data analysis technique of "reduction" and "interpretation". This data analysis technique implied taking the thick descriptions (voluminous amount of data) and reducing it into certain patterns, categories or themes and then interpreting it using a schema and the theoretical frameworks that emerged in my literature review processes. Devos and Fouche (1998, p. 203) referred to this approach to data analysis and interpretation as a process of breaking data into constituent parts to obtain answers to research questions. In practice that saw me developing analytical memos from which analytical statements (knowledge claims) were later generated in chapter five.

The process also involved exploring *words* and *concepts* within the voluminous data. According to O' Leary (2004, pp. 196-197) words can lead to themes through exploration of their repetition or through their context and usage. I also drew some ideas for data analysis from the notion of "constant comparison", as put forward by O'Leary (ibid, p. 197) which implied that concepts and meanings had to be explored in each thick description and then compared with previously analyzed text to draw out both similarities and disparities. I immersed myself in the details and specifics of the data that I collected aiming to discover important categories and dimensions relating to the opportunities and challenges for the integration of indigenous knowledge into the Sebakwe Environmental Education programme (Patton, 1990, p. 40).

In general, the two data analysis (and also interpretation) approaches allowed the researcher to work with both inductive and deductive reasoning as the basis for the drawing of analytical statements and meaning making processes. Inductive data analysis (and also inductive reasoning) is seen as central to post-positivistic qualitative research such as this exploratory educational research (O'Leary, 2004, p. 195).

The following are representations of the data analysis processes that I carried out within the premises of this research project. These presentations are linked to the six emerging themes that came out in chapter three.

4.2 On structure and organisation SEEP

It was very important as outlined in the research methodology chapter to ensure that I gain enough insight into the structure and organisation of learning within Sebakwe Environmental Education programme (SEEP) so as to be able to explore the opportunities for achieving the integration of indigenous knowledge into the programme.

According to data generated from the three data collection processes (DGph 1, 2, & 3) SEEP is organised and implemented mainly through school bush camps or school environmental excursions. These camps as reflected in the programme documents (SECb, SCp1 and SCp2), (see appendix 4.1) involve five central learning categories namely;

1. **Open lectures** and presentations on different environmental and wildlife topics,
2. **Environmental games** such as the Enviro-picture building (Malusuthe's farm), the Echo-footprint game, Hide and Seek and many others,
3. **Campfire** (story telling),
4. **Nature interpretation** or field work-based activities such as bird walks, rhino trekking and game drives.
5. **Video shows** covering a wide range of wildlife and related environmental concepts.

According to the Environmental Education Officer (EEO-S1) these five central learning categories are organized and run from the Sebakwe Conservation Centre. Evidence from both the focus group interview (DGph 2) and the workshop (DGph 3) point to how the organization of the school camps and the running of the camp programmes (curricula) are done by the EEO with help and input from the teachers

intending to bring their classes for the camps. It also emerged that each of the five central learning categories that make up Sebakwe Environmental Education programme is made up of different learning activities or interactions as described below.

4.2.1 Environmental Interpretation (Field work): Was reported to be conducted in the nearby Midlands Black Rhino Conservancy. The nature interpretation learning process includes such activities as;

- ✚ Identification and study of tree species within the conservancy during which school children are guided by the educators to identify the different tree species and other vegetative species found in the area and the outlying community of Sebakwe. Within this learning activity learners are provided with opportunities to find out as much as they can about the various vegetation and uses of certain tree species. It was also interesting to note at times learners are asked to name the trees in their own local languages (DGph 2, S2).
- ✚ Identification and study of wild birds and wild animals found in the conservancy. Here learners are expected to be able to know the names of the animal life that they see during the game drives and bush walks. For each of the species the learners discuss things relating to classification of the animal species, its distribution, feeding and breeding behavior. Field guides (identification books) are often used to ensure that learners are helped to arrive at correct identification of the animal species that they encounter.

It also emerged that nature interpretation and field work provided learners with a lot of opportunities to study learn in the environment and enjoy nature. Field work was mentioned as a key learning category very popular with many schools (S1, T2w). Field work activities appeared in the two school camp curricula (SCp1 & SCp2) analyzed within this research (see fig 4.1 below).



Figure 4.1 Learners engaging in field-based environmental learning in the conservancy

4.2.2 Video Shows and Discussions: A number of wildlife videos covering diverse wildlife and environmental issues and concepts are available and used during school environmental camps to help learners improve their knowledge of wildlife and the environment. The video shows are organized and done in such a way that they promote interactive learning (DGph 2, S2, and S5). First the facilitator develops some questions for the learners to answer at the end of the video show. According to the data generated in the focus group interviews (DGph2) when learners come for their bush camps they have a wide range of video films to choose from and what they eventually watch depends on their interests and camp programme stipulations. Commonly used videos for school bush camps are;

- The Super Predator
- Super Hunts Super Hunters
- PACE Environmental Education DVDs
- Okavango Magic

- Last feast of the crocodile

All these videos are said to help learners develop scientific knowledge on wildlife and the environment covering different concepts for instance food chains and webs, natural selection and adaptation, among other ecological concepts (DGph 3, S5w). During the workshop it also emerged that the use of videos in education is highly recommended (MoESC 1). Commenting on the use of videos the two local community representatives (DGph 3, LC1, and LC2) pointed out to the effect that there is need to look for video films that portray local (African/traditional) ways of relating and managing wildlife and the environment. The EEO (S1w) also maintained that the video shows constituted a very important way of promoting environmental learning within Sebakwe Environmental Education programme and that learners' participation is always very high during video show viewing and discussions (DGph 2). However it was also reported during the workshop (DGph 3) that learners from the local area (newly resettled community) were not as active and participative as those from the urban settings during the wildlife video shows. The issue of language was point out as the possible drawback to the rural learner as the narration of the wildlife video films used is done in English. And given the poor command of English associated with most learners from rural areas such as Sebakwe this is a real challenge.

4.2.3 Direct lectures and presentations: Different presentations are done during school bush camps and these range from topics on basic ecological processes and concepts to projects responding to environmental issues such as campfire conservation projects and problem animal control. Topics are often influenced by the national curriculum (DGph 2 T1 & T3). During the workshop (DGph 3) it emerged that Sebakwe Environmental Education programme as an environmental education programme work in line with the Zimbabwean government's endeavors to integrate environmental education into the formal school curriculum. This relationship is said to have a strong influence on the organization, content, and implementation of the programme. Therefore when it comes to the choice of topics, and content of open lectures the EEO (S1) liaises so much with teachers of the visiting school, the aim being to make sure the topics relate to the school curriculum. The relationship between Sebakwe Environmental Education programme and the national school curriculum was very important for this research and I needed to continue reflecting on it as I moved to interpretation of data and identification of the challenges and opportunities for the

integration of indigenous knowledge into the Sebakwe Environmental Education programme.

4.2.4 Environmental Games: The camp programmes studied indicated that environmental games form quite an important aspect of the learning interactions that make up Sebakwe Environmental Education programme. Environmental games often used were noted as; the Enviro-picture building game called Malusuthe's farm and an Eco-footprint game, both produced by Share-Net in South Africa. These two games are quite often used as was indicated by the school camp programmes (SCp1, and SCp2) that I analyzed. Document analysis of the two games showed that the enviro-picture building game is aimed at helping learners to open up space to discuss common farm context environmental issues e.g. pollution of rivers, deforestation, soil erosion, over grazing, and how these environmental problems can be solved. On the other hand the Eco-footprint game is an environmental game that helps learners to take a critical look at their own life styles and the ecological impact these life styles has on the environment. The eco-footprint game however seemed to probe life styles that are more oriented to western and urban kind of life styles and choices e.g. shopping choices, size of houses and number of bedrooms against household population, means of transport, and issues linked to energy sources and uses (DGph 3 S1, MoESC 1).

Another learning activity shown in the schools bush camp programmes and aligned to environmental games are the wildlife quiz competitions. According to the EEO (DGph 2, S1) the wildlife quizzes are aimed at testing learners' knowledge of wildlife and ecological concepts such as food chains, food webs, wildlife species, balance of nature, and predator- prey relationships only to name a few. So during the wildlife quiz learners are asked questions relating to wildlife and the environment. Basically it emerged that the wildlife quiz competitions are biased on promoting or development of scientific knowledge traditions and practices. Hardly do the quiz questions ask for indigenous knowledge and practices (See appendix 4.2)

On probing if there has been any effort to broaden the scope of the wildlife quiz competitions, as a learning activity to include other dimensions of the environment and the associated knowledge traditions, it came out that there has not been any such effort or thinking (DGph 2, S1, Sw1).



Figure 4.2 Learners engaging in an environ- picture building game within a school bush camp

4.2.5 Campfire (Story telling): In one of the school camp (SCp2) programmes studied there was provision for school children to conduct an evening campfire and story telling learning activity. Campfire, the researcher gathered involved learners sharing or telling different folklores relating to environmental matters. However the school camp programme did not show the types and or diversity and orientation of the folklores that children shared during the campfire learning interactions. However comments from the EEO (DGph 2, S1) showed that the campfire activity was a popular learning event within this environmental education programme. Further probing established that the campfire learning activity was usually popular with rural schools probably because children from these schools have some traditional stories to share whilst those from the cities are usually either not interested in traditional stories or do not have the stories at all (DGph 2, S1).

4.3 On Learning Support Material (LSM) used within SEEP

Through the process of document analysis (DGph1) and the focus group interviews (DGph2) it emerged that there is a wide range of learning support materials (LSM) being used to support environmental learning within the five learning categories that constitute the Sebakwe Environmental Education programme. Data from the school

camp programmes (SCp1 & 2) showed that the learning support materials used vary and included; the wildlife fact sheets which is a compilation of information sheets on common wildlife (animals), a number of environmental games packs, videos cassettes and DVDs, a wide range of specimens and wildlife and environmental books (field guides, journals, wildlife magazines, and leaflets.) There is quite a lot to choose from in terms of learning support materials when running school bush camps, the Environmental Education Officer pointed out (DGph 2, SC1).

Data from the focus group interviews (DGph 2) further revealed that out of the wide range of learning support materials available within Sebakwe Environmental Education programme the commonly used materials were; the wildlife fact sheets and the Enviro-picture building game called Malusuthe's farm (see fig. 4.2)

4.3.1 The Wildlife Fact Sheets

The wildlife fact sheets are produced by a local environmental education learning support material developer-ACTION, for use in schools to help learners develop a clear understanding and appreciation of wildlife in Zimbabwe. In total the fact sheets cover a wide range of wildlife species and for the Sebakwe Environmental Education programme the species which are often focused on are those wildlife species that are found in the conservancy (Sw3, Tw1).

The fact sheets provide scientific and ecological information on each of the wildlife species given. The information covers, breeding and feeding behaviour, distribution of the species in Zimbabwe, ecological and economic value of the animal, most specifically for CAMPFIRE programme, because these fact sheets were produced within the context of the CAMPFIRE programme in Zimbabwe. Names of the animals are given in all the three local languages (English, Shona & Ndebele). However it must be noted that in the main the fact sheets appears to promote scientific knowledge which according to the teachers interviewed and involved in the workshop discussions (DGph 2 & 3; Tw1, Tw2, & Tw3) helps their learners to pass the general paper examination. For this reason the fact sheets are very popular with teachers and they all demand to have copies every time they come to the environmental centre (EEO, S1).

4.3.2 The Enviro-Picture building game (Malusuthe's farm)

The school camp programmes (SCp1 & SCp2) and the focus group interviews (DGph 2) showed that the Enviro-picture building game is often used within almost all of the school bush camps done within the Sebakwe Environmental Education programme. On probing further it emerged that the Enviro-picture building game is used to

introduce learners to common environmental issues or problems such as soil erosion, deforestation, monoculture, and pollution in its different forms. It was also pointed out that the game provide for both education and team building opportunities. The game involves learners competing in two groups, each fighting to get highest points. The game moves on to engage learners in the identification of environmental problems depicted on the picture of a farm. From there learners will be asked to suggest possible ways of rectifying the shown environmental problems. Out of this learners are expected to gain scientific knowledge of local environmental problems and think of ways of taking action to solve the problems.

Notable things that emerged and relates to the focus of this research is the observation that learners from rural (farm like) backgrounds can easily identify with the knowledge (content/subject matter) that the Enviro-picture building game seeks to promote (DGph 2 & 3). The game was reported to provide for active participation of the learners (DGph2.T1, T2 & T3).

4.4 On language use within the learning categories

In all the school bush camps both the focus group interview (DGph 2) and the workshop (DGph 3) revealed that the main medium of instruction within the SEEP's five central learning categories is the English language. Teaching and learning within the different categories of Sebakwe Environmental Education programme take place in English. The Environmental Education Officer (DGph 2, S1) said that English language is used because it is the official medium of instruction in the national mainstream education system. On further probing why learning was taking place through English it was alleged that both local teachers and learners seemed to perceive their own mother tongue languages (Shona & Ndebele) as inferior and thus they always go out of their way to avoid using it.

It was also reported (DGph 2, S3) that at times the facilitators or educators of the school camp programmes are forced to use other languages such as Shona and Ndebele, especially when they are having camps involving local rural schools. Of importance to this research project is the fact that the level of learners' participation and understanding of taught concepts was reported to be better when the facilitators use learner's vernacular languages (DGph 3, Sw2, and Tw1).

4.5 On content (Knowledge systems) constitution and SEEP

One of the things that were very important to investigate in this research project was the knowledge systems (epistemologies) inherent within the Sebakwe Environmental Education programme (SEEP) and the sources of the knowledges. During the document analysis (DGph 1, SCEb & SCp 1 and 2) I noted that most of the knowledge (content) that is playing out within Sebakwe Environmental Education programme's five central learning categories is basically of western scientific orientation and is drawn from scientifically oriented sources. Such sources included the wildlife field guides, environmental journals, other scientific text books, and as well as from the various wildlife and environmental video films shown to the visiting students. These knowledge sources have a strong scientific bias and hardly acknowledge and promote indigenous knowledge systems and practices.

On trying to find out whether indigenous knowledge systems (as an alternative form of knowledge) could also be supported in the Sebakwe Environmental Education programme most of the research participants interviewed and involved in the workshop thought that promoting use of indigenous knowledge in SEEP was going to be very difficult. Only a few of the participants in both the interviews and workshop were quick to point out that there was also a possibility for bringing indigenous knowledge into the Sebakwe Environmental Education programme. An outline of these possibilities (as identified by the research participants) is outlined in section 4.6 below.

4.6 On aspects of SEEP that could represent possibilities for the integration of indigenous knowledge

During the three data generation phases I kept on probing for the participants' views, ideas and suggestions about the possible ways if any of working towards achieving the integration of indigenous knowledge systems (inter-epistemological dialogue) into the Sebakwe Environmental Education programme's teaching and learning categories. My aim was, in line with the purpose of this research project, to gather those views and ideas and use them (in chapter 5 & 6) to provide basis (in combination with literature and theory available) for the drawing of knowledge claims (analytical statements) responding to the set research questions. Therefore what I presented to you in this section of chapter four is therefore the "thick descriptions" of the views and ideas that were put forward by the various research participants

regarding indigenous knowledge systems and the possibilities for its integration into Sebakwe Environmental Education programme. These ideas will further be interpreted in chapter five to come up with clear answers to the research questions as shown in chapter one.

4.6.1 The participatory nature of the Sebakwe Environmental Education programme

It emerged that most of the interviewed participants and those that took part in the workshop felt that the participatory approach being used within Sebakwe Environmental Education programme could present a chance for working with indigenous knowledge systems in the programme's learning categories (DGph 2 & 3, T1, T2, S1, Sw1, MoESC, and BEST). It was argued that since the EEO works and consults with the teachers when drawing a school camp programme (curriculum) it was possible to cater for different schools and learners' backgrounds including their cultural and epistemological interests.

4.6.2 The value of Indigenous knowledge systems within the Sebakwe community

It also emerged that whilst most people might think that indigenous knowledge is outdated and less valuable the Sebakwe community still have a high regard for indigenous knowledge systems (DGph 3, LC 1 & 2, and T1 & T2). It came out clearly that the people of Sebakwe might be supportive of the possibility of incorporating indigenous knowledge into the Sebakwe Environmental Education programme. During the workshop (DGph 3, LC1, Tw1 & Tw2,) both the local councillor for ward two (in which the Sebakwe Environmental Education programme is operating) and the two local school teachers openly advocated for the integration of local knowledge into education and pledged to support such a process. These three research participants bemoaned their olden day traditional education system which enabled them to better understand their everyday life activities and expectations.

4.6.3 Sebakwe: a community rich in indigenous knowledge systems

Slightly related to the previous point both the focus group interview (DGph 2) and the workshop (DGph 3) revealed that there is still a good number of elderly people within the Sebakwe community who possess vast wildlife and environmental knowledge. These local community elders were said to be repositories of indigenous knowledge systems and could be given a chance to participate in the environmental education

programme's teaching and learning processes. Examples of indigenous knowledge systems inherent within the Sebakwe community were briefly discussed and some are outlined in table 4.1.

Table 4.1 Examples of indigenous knowledge systems and practices within Sebakwe Community (These examples were discussed in the workshop).

Environmental focus	Indigenous knowledge systems and practices	Strategies for working with the knowledge systems
Conservation of trees	I. Tree species such as those that bear edible fruits are not cut down or used as fuel wood. Trees such as the baobab, sickle bush, monkey orange trees are considered sacred and protected II. The sacred trees are shelter for local spirits and ancestors	Taboos, myths and beliefs e.g. Cutting down such trees might bring bad luck into the family or even cause divorce in the household using them for firewood Using fire wood from these trees might even make the food being cooked unhealthy to the family. If such firewood was used to brew traditional beer it would not ferment well
Conservation of wildlife (animals)	I. Wild animals such as eland, elephant are not eaten by some of the people in the community II. Hunting of wildlife is prohibited in the rain season	Totems- some people in the community have their totems as wild animals. Those of the <i>Mhofu</i>, and <i>Hwata</i> totems are not supposed to eat eland and Secretary bird respectively Traditional control of hunting embedded in the status of village chief
Conservation of water	I. No one is supposed to fetch water with a black pot or pot used for cooking II. It is forbidden to kill frogs found in the village wells III. When fetching water from a well one needs to scoop out all stagnant water first and then wait for new water to come out IV. No one is allowed to drink water by mouth from a well or river OR to urinate in water	Beliefs and myths helping to control this include; Fetching water using a black pot causes the well to run dry or angers the spirits. Fetching water with a metal container affects the sweetness of the water Drinking water with mouth causes sore throat or results in one getting taken by a mermaid resident in the rivers Urinating in a river or well will cause death of the family livestock
Waste disposal and Sanitation	I. Human waste must be covered with soil all times, especially for the children	Leaving waste uncovered can make one sick. It was reported if one does not cover the waste his or her health will deteriorate

The indigenous knowledge systems and practices outlined in this table are not the only ones within the community. It was also mentioned during the workshop that most of the local indigenous knowledge systems and practices are already well

documented and are available for use or adaptation within the mainstream environmental education programmes such as the Sebakwe Environmental Education programme (DGph 3, BEST, S1, and Tw1)

4.6.4 Appropriate learning support materials (LSM)

During the workshop (DGph 3) it also came out that whilst most people (teachers, SEEP programme staff and other community members) thought that there was totally nothing in terms of appropriate learning support materials to support the integration of indigenous knowledge into environmental education programmes, there are in actual fact a diverse range of materials (booklets, pamphlets, field guides and videos) in Zimbabwe that could be used to promote the use of local knowledge in education. Mr. Sibanda (DGph 3, MoESC) argued that the problem of marginalisation of indigenous knowledge in education was not because of the lack of resources but because teachers are not keen and resourceful. He gave examples of readily available booklets within Zimbabwe that can be used to promote indigenous knowledge systems relating to the environment and conservation. The booklets ranged from collection of traditional folklores and narratives to collection of indigenous knowledge learning materials such as those documented by Soul Shava, and Joseph Matowanyika.

4.6.5 Cultural diversity within the Sebakwe Community

Another very important issue that was raised during both the focus group interviews and workshop related to cultural diversity within the Sebakwe community. Some of the participants (S1, S2, S3, and T3) thought the cultural diversity might be a barrier against efforts to integrate indigenous knowledge into the Sebakwe Environmental Education programme. It was pointed out that there might be problems around which amongst the diverse cultures and knowledges within the community was going to be used in the education programme.

Slightly related to the above observation was the possibility some of the elderly people fearing to share their indigenous knowledge systems and practices with the wider community. It was pointed during the workshop discussions that within local communities some elderly people may not be comfortable with sharing their information, knowledge and skills with other people. Examples given include the local *sangomas* (traditional healers) who might be having vast knowledge of indigenous plants and their medicinal uses but may not be at liberty to share that information for free. Such a situation, it was felt might stand in way the of integration of local

knowledge systems and practices into the Sebakwe Environmental Education programme (DGph 3, Tw1, Tw2, Sw2 and BEST).

4.6.6 Relevance and recognition of indigenous knowledge in mainstream education

The relevance and recognition of indigenous knowledge systems to the national education assessment strategy (examination system) was also pointed out as another possible threat for use of indigenous knowledge systems in a programme such as the Sebakwe Environmental Education programme (SEEP). Mr Sibanda (DGph 3, MoESC) said that under the current education system all environmental education programmes are expected by government to support (integration of EE into national curriculum) the national education curriculum and what that implies is that education programmes such as Sebakwe Environmental Education programme should promote knowledge systems and practices that are in line with the national education system, including the assessment policies. There was fear amongst the research participants that emphasis on use of indigenous knowledge within the Sebakwe Environmental Education programme might make the programme less meaningful or important (here I refer to importance in relation to the examination not the learner's context) to the learners since the knowledge is not recognised by the current examination system (DGph 2, T1, T3, S1, S4, and S5).

4.6.7 Continuous use English as a medium of instruction

The use of English language as a medium of instruction within the five central learning categories of the Sebakwe Environmental Education programme was mentioned during both the focus group discussion and workshop, to be a potential drawback to the integration of indigenous knowledge systems into the Sebakwe Environmental Education programme (DGph 2, S1, S4, T2 and DGph 3, BEST, MoESC 1). It was pointed out that both teachers and learners are said to have a tendency of looking down upon their own local languages (DGph 2, S3). Failure to express oneself in English is seen as a sign of inferiority. Participants felt that it was going to be very difficult to bring indigenous knowledge systems into Sebakwe Environmental Education programme if the issue of language was not fully addressed

4.6.8 Religion and Indigenous knowledge systems

The conflicting views between certain religions and indigenous knowledge inherent within the Sebakwe community came out as a cause of concern. It emerged during the focus group interviews (DGph 2, S2, S4, T1) and the workshop (DGph 3, LC1, T1, BEST, MoESC 1) that some of the religions within the Sebakwe community view indigenous knowledge as pagan and unholy. There was concern amongst the research participants that children coming from Christianity backgrounds such as the Seventh Day Adventist (SDA), Apostolic Faith Mission (AFM) and Roman Catholic which are heavily represented in the Sebakwe community might not appreciate or readily accept the use of traditional knowledge systems and the associated teaching and learning methods. It was further pointed out during the focus group interview and the workshop (DGph2 & 3) that some of the children because of their religious backgrounds are not allowed to learn about certain indigenous knowledge systems concepts such as traditional medicines and herbs, totems, rituals and ceremonies. The same children might also not be comfortable with traditional teaching and learning methods such as traditional games, folklores, proverbs, and ceremonial processes all of which are unfortunately quite an important part of indigenous knowledge systems.

4.7. Conclusion

This chapter reports the evidence gathered through the three-phase research process. The chapter comprised of “thick descriptions” of what the researcher had found during the three-phased data generation processes. The “thick descriptions” were presented in relation to the six themes identified in chapter three.

The same chapter also covered issues around the theoretical frameworks that guided the data analysis (and also interpretation in chapter 5) processes. The chapter served to process raw data into evidence (analytical memos, see appendix 4.3) which I moved on to interpret in chapter five. Insights gained during the data analysis processes, even though they did not provide direct answers to my research questions, were actually very useful. The insights acted as signals pointing towards what could be the real challenges and opportunities for the integration of indigenous knowledge into the Sebakwe Environmental Education programme. In chapter five I used these insights in combination with the literature available and experiences from past and previous researchers to draw meaningful conclusions (analytical statements) regarding the possibilities of integrating indigenous knowledge systems

into the Sebakwe Environmental Education programme's five central learning categories.

Chapter Five

Discussion and Interpretation

5.0 Introduction

This chapter is a continuation of the data analysis process, where I start to draw meaningful conclusions (analytical statements) relating to the research questions. Here I engaged with the six themes (key issues relating to indigenous knowledge and Sebakwe Environmental Education programme) that emerged in the data analysis process. In exploring the evidence related to these themes I also worked with literature (theoretical vantage points), and own prior experiences of working with indigenous knowledge systems (IKS) and environmental education processes (O' Leary 2004, p. 196). This layered and deliberative approach to the interpretation of evidence, experiences and literature resonated well with the qualitative and exploratory nature of this particular research. From the interpretation and discussion of the research findings I then move on into chapter six to draw some recommendations for guiding the integration of indigenous knowledge systems into the Sebakwe Environmental Education programme.

5.1 A mixed bag of opportunities and challenges

Analytical statement 1: The organization and structure of the Sebakwe Environmental Education programme represents a mixed bag of opportunities and challenges for the integration of indigenous knowledge.

Within the Sebakwe Environmental Education programme, learning is organized into categories each of which is designed in a participatory and consultative manner (AM1). The fact that the Environmental Education Officer (EEO) consults with the school teachers when designing the school camp programme presents a good opportunity for the contextualization of the camp programme or curriculum (Cornbleth, 1991). Such an open and participatory approach to developing a learning programme can help to open spaces through which learners' everyday life experiences (their cultures and knowledge forms) and knowledges can be integrated into learning processes. Further more the interactive and consultative approach to curriculum (camp programme) development that is characteristic of the Sebakwe

Environmental Education programme further helps to ensure that the school camp programme as representing the curriculum is contextually responsive to the learners' socio cultural background (Taylor & Mulhall, 2001, p.137).

According to Cornbleth (1991) context is more than just the place, but includes socio-cultural perspectives such as the cultures and knowledge systems and practices inherent within the Sebakwe community, the different religions found within this community and all the other socio-political issues that shape and influence life within this newly established farming community.

Taking this theory of curriculum in context further and using it in combination with the perspective gained from the gathered and analysed data, to explore how indigenous knowledge can be incorporated into the Sebakwe Environmental Education programme, it is apparent that there is room within the current organization and structure of Sebakwe Environmental Education programme for bringing in indigenous knowledge into the programme's five learning categories. Since the development of the school camp programme (curriculum) takes into consideration the context of the school children (and their cultural backgrounds and the poor educational infrastructure in Sebakwe) it should therefore be possible to develop school bush camps (curriculum) that allows for the use of both indigenous and scientific knowledge systems and practices (AM 1, DGph 2- S1 & S2 and T1).

And because the organization and structure of the Sebakwe Environmental Education programme is not rigid but flexible it should also be possible for the Environmental Education Officer to structure and organize the lectures, campfire activities, the environmental games, field work activities and videos shows in a way that suits the existing structural and socio-cultural context of the Sebakwe community. Such organization and structuring of learning within Sebakwe Environmental Education programme have great potential to enhance and contextualise both the content (epistemology) and pedagogy (teaching and learning process) of the environmental learning that take place within the programme.

However it should be noted that even though the organization and structure of learning within the Sebakwe Environmental Education programme is flexible and participatory there are certain features within it that can possibly obstruct the integration of indigenous knowledge into the learning processes. One of these features is the use of the lecture method (AM1, and see section 4.2.3). Lectures are

known for their being teacher centred (behaviourist) and if used without care can promote rote learning. Behaviourist learning categories such as lectures do not normally provide for the contextualization of the learning processes as they often disregard the learner's prior knowledge and experiences. Direct instruction such as the lecture method is usually fruitless as using this approach achieves nothing but mindless learning of words (Vygotsky, 1987, cited in Daniels, 2001). Hence the organization of learning into lectures within the Sebakwe Environmental Education programme has potential to act against the integration of indigenous knowledge into the programme.

The other feature that is of concern in terms of the integration of indigenous knowledge into the Sebakwe Environmental Education programme is the use of wildlife video films (AM1). The range of videos currently being used are said to be scientifically biased. These video films promote development of scientific and ecologically oriented concepts (AM 3 & AM 4). It also emerged that the video films being shown to school children when they come for their environmental education camps do not contain any indigenous knowledge systems or practices (see section 4.2.2). Therefore it can be argued that the use of wildlife videos with bias on scientific knowledge constitute a challenge for the integration of indigenous knowledge into the Sebakwe Environmental Education programme.

Looking at the issues highlighted in this section, one can therefore safely claim that the organization and structure of the Sebakwe Environmental Education programme represents both opportunities and challenges for achieving the much desired epistemological pluralism.

5.2 The Teaching and Learning approaches used: Inherent opportunities and challenges

Analytical statement 2: Open inquiry and participatory teaching and learning methods can provide room for the integration of indigenous knowledge systems into the Sebakwe Environmental Education programme

The teaching and learning methods being used within the Sebakwe Environmental Education programme as evidenced by the data gathered are worth exploring for

opportunities and challenges influencing the integration of indigenous knowledge into environmental education learning processes (AM2). The open-enquiry based teaching and learning methods that are being used within the school environmental camps lays emphasis upon learning from the community (Fien, 1993, cited in Masuku, 1999). The use of participatory teaching and learning methods such as the environmental games, the campfire (story telling), and field based activities, in which the environmental educator provided learners with opportunities to participate actively, and to discuss environmental concepts and issues in depth and detail can open up space for learners to bring their own local epistemologies and experiences into the learning processes. For instance within the field work or nature interpretation it was reported that learners are asked to identify and name wildlife species using their own local languages. Learners are also challenged to discuss local uses of particular tree species (see section 4.2.1). It is through such often ignored aspects of a learning programme that indigenous knowledge can be incorporated into environmental education programmes.

Furthermore open and participatory teaching methods that are used within the Sebakwe Environmental Education programme relate quite well to the traditional teaching and learning methods that Shava (2005), advocated for in education. Traditional teaching and learning methods such as story telling (folklores), games, learning by doing, dances, ceremonies and songs were all very participatory, providing room for learners to participate (Agyeman, 2002). And in relation to the need for environmental educators to think critically about the teaching and learning methods that they use Agyeman (2002) argued that;

We must not just educate in a culturally appropriate way, rather we must educate in a culturally inherent way...employing indigenous ways of teaching and learning including ceremonies, story telling, learning by doing, dreams, visions, observation and reflecting... this not only allows learners to share in a culturally inherent manner but also reinforces the concept that indigenous knowledge is not only content but also process.

(p. 3)

Thus it is fortunate that within the Sebakwe Environmental Education programme such participatory methods which have characteristics of the indigenous ways of teaching are already being used. In addition to helping bring indigenous knowledge into the learning processes, the use of open inquiry and participatory

teaching methods within the Sebakwe Environmental Education programme can also provide room for contextualization of the learning processes.

On the other hand it is not every teaching and learning method used within the Sebakwe Environmental Education programme that is participatory. Like many other environmental education programmes the Sebakwe Environmental Education programme is still employing teaching methods that are teacher-centred. Such methods as reflected in chapter four include the lecture method, the “show and tell” method that sometimes take place during the field work (nature interpretation) and the wildlife quiz competition which very often emphasizes rote learning and regurgitation of learnt concepts (AM 2). These methods put together have the potential to stand in the way of achieving the integration of indigenous knowledge into the Sebakwe Environmental Education programmes’ learning processes. Linked to this is the fact that even if there has been a lot of evolvement (change) within environmental education teaching and learning methodologies, the teacher-centred and often technocratic methodologies still persist (Cornbleth, 1991). Environmental Educators (including those within SEEP) seemed to favour transmissive teaching methods and have got used to them so much that changing would be difficult. Bourdieu (1998) cited in Jenkins (1992) referred us to the idea of “social habitus” which influence people to resist change as changing would mean moving out their comfort zones and very often brings along a lot of challenges. And because of the “social habitus” the educators working within the Sebakwe Environmental Education programme may continue to use the teacher centred methods at the expense of the open- inquiry based (participatory) methods that could make it possible for the integration of indigenous knowledge into the programme.

5.3 Do learners learn in order to pass an exam or to improve their livelihoods: The dilemma of a de-contextualized environmental education programme?

Analytical statement 3: The fact that the Zimbabwean education system has remained westernized and that indigenous knowledge systems have not yet received recognition from the national examination system present a big challenge for the

integration of indigenous knowledge systems into the Sebakwe Environmental Education programme.

It also emerged during the data analysis process that one of the areas influencing the epistemologies that are being promoted within the Sebakwe Environmental Education programme related to the issue of how relevant those epistemologies are to the learners in respect of not every day life but the national examination system (AM 4). The content (knowledge) being used within Sebakwe Environmental Education programmes is unfortunately closely determined by the national education curriculum which in the case of Zimbabwe have remained westernized (Mandikonza, 2007; and Zvobgo, 2007). The history of Environmental Education (EE) in Zimbabwe has been such that Environmental Education programmes should compliment what learners learn in the mainstream education system (Shava, 2005). Such a relationship between environmental education and the national education system (with its western and scientific oriented assessment systems) can be interpreted as a challenge for the integration of indigenous knowledge systems into environmental education programmes such as Sebakwe Environmental Education programme. This perspective also can help us to appreciate why even in the few instances those educators have attempted to use indigenous knowledge; they have used in a verificationist way (Shava, 2005). Such knowledge is not accepted as valid unless it can be scientifically verified.

It was noted during the data analysis process that teachers and learners are more concerned with how far the learning that takes place when they conduct school environmental camps is going to help them pass their final examination (see section 4.5). Therefore learners are by default forced to learn in order to pass exams not to directly improve their own daily lives (Mandikonza, 2007). The end result here is the fact that learners continue to be exposed to learning that is disconnected from their own daily lives (Mokuku, 2001). And because of this, learners within Sebakwe Environmental Education programme suffer the consequences of a decontextualized learning process where they get exposed to two different world views, the everyday world view and the western scientific world view. The reason for this was summarized by Bowers (2001) when he pointed out that;

1. Despite its merits indigenous knowledge systems as either a concept or body of knowledge has not yet received complimentary status to western science.
2. Indigenous knowledge is not necessarily meaningful in terms of prevailing ways of organizing learning e.g. subject based didactic approaches.

Therefore unless the Zimbabwean education system recognize and acknowledge the value and role of indigenous knowledge systems in education, efforts to integrate the knowledge into learning will continue to be wishful thinking. Most importantly the discussion concerning the national examination system's lack of respect and recognition of indigenous knowledge systems can help one to understand the persistent domination of western scientific knowledge within education across the Southern African region, Sebakwe Environmental Education programme included. (See section 4.5)

However one can still argue that within the interface between the issue of relevance, and the skewed relationship between the Sebakwe Environmental Education programme and the national education system lie both opportunities and challenges for the integration of indigenous knowledge systems into the Sebakwe Environmental Education learning categories and processes.

It can be argued that the realization that what learners are learning about in the Sebakwe Environmental Education programme is not finding direct use in the learners' every day lives could be used as the basis for advocacy aimed at promoting the integration of indigenous knowledge (local knowledge) into SEEP's learning processes. Based on the context and purpose of Sebakwe Environmental Education programme (to raise awareness and promote sustainable use of natural resources within the newly established Sebakwe community) it could further be argued that Sebakwe Environmental Education programmes' learning processes should not be examination-bound as its purpose is not only to help learners appreciate environmental or scientific ecological concepts but to equip them with knowledge and skills needed to cope with the environmental issues and risks within their local villages.

Such thinking and arguments does act in favour of the use of indigenous knowledge systems alongside western scientific knowledge in the Sebakwe Environmental Education programme's learning processes. And because of the inherent cultural

diversity of the Sebakwe community and the learners who participate in the school bush camps, the content (knowledge) that plays out within Sebakwe Environmental Education programme should be influenced by and taught from multiple cultural perspectives (Grass, 1996). Learners should be able to identify with the knowledge that is generated during the learning processes. This will make learning contextually relevant.

Finally I should mention that embedded within this complex relationship between the Sebakwe Environmental Education programme and Zimbabwe national curriculum, the programmes' context and purpose and the notion of "relevance" are valuable insights that can be used to develop guidelines or recommendations for the integration of indigenous knowledge into environmental education learning categories and processes.

5.4 Indigenous knowledge and the Cultural diversity within the Sebakwe community

Analytical statement 4: The cultural diversity inherent within the Sebakwe community stands as a barrier for the successful integration of indigenous knowledge systems into the Sebakwe Environmental Education programme.

One of the issues that Reid (2004) pointed out as one of the weaknesses of indigenous knowledge is its dependence on cultural stability. However it emerged that the learners who participate in the Sebakwe Environmental Education programme at any one point of time come from families with different socio-cultural backgrounds (AM 4, AM 6). These learners' beliefs, norms, values and myths (all of which are very important elements of indigenous knowledge systems) differ. The challenge then is how best SEEP environmental educators will plan for multicultural learning within such a context without falling into the trap of what Agyeman (2002) called "targeted environmental education". The problem of trying to apply indigenous knowledge within the contemporary education programmes such as the Sebakwe Environmental Education programme, therefore does not lie only in the constitution, structure and philosophies of modern day education systems as pointed out by Bowers (2001) but also in what Shiva (2003) referred to as the fragmented cultural distribution of knowledge within societies. Indigenous knowledge systems as is seen

within the case of the Sebakwe community vary from one culture to another. In practice it therefore becomes very challenging to work with indigenous knowledge systems in a setting like the Sebakwe Environmental Education programme, where participants and intended beneficiaries hold different cultural values.

The implication of the cultural diversity that is within the Sebakwe community is that efforts to incorporate indigenous knowledge systems into Sebakwe Environmental Education programme will present the Environmental Education Officer and the teachers with a challenge of ensuring that the school camp programmes are multicultural enough to provide room for inclusion of knowledge systems and practices that fully represent the diversity of learners socio-cultural backgrounds. Such a challenge is likely to force the educators to stick to the current technocratic and scientifically biased approach to curriculum development (Cornbleth, 1991).

5.5 The language dilemma within Sebakwe Environmental Education programme

“Ecological knowledge accumulated by indigenous people comes to be embodied through language...language extinction leads to loss of the ecological knowledge” (WWF, 2000 cited, in Reid 2004, p. 24)

Analytical statement 5: There is an apparent marginalization of local languages within the Sebakwe Environmental Education programme.

Another very important issue that came out from the data analysis process related to the use of language within the Sebakwe Environmental Education programme. It emerged that the main language that is being used as medium of instruction is the English language (AM5). One of the reasons for the use of English is that the current relationship between Sebakwe Environmental Education programme (SEEP) and the mainstream education system, requires SEEP to complement the Environmental Science syllabus which in turn is by design and policy supposed to be taught in English.

Further more another very important issue that also emerged within the data analysis processes is the fact that teachers and learners and even the parent community to a certain extent still look down upon their own vernacular

languages. Some of the people within the Sebakwe community believe that there is little value in their own language and knowledge systems (Sibanda, 1999). This inferiority complex tied to local languages and also the knowledge systems maybe as a result of the “self validating reductionism” that traditional knowledge systems and languages have suffered due to colonialism (Weston, 1996).

And because language plays an important role in the promotion of indigenous knowledge and its transmission from one generation to the other, this persistent domination and marginalization of local languages within Sebakwe Environmental Education programme act as a challenge for the integration of indigenous knowledge systems into the programme’s learning categories. Most of the indigenous knowledge systems as pointed out by Reid (2004) can only be precisely represented through use of local languages. Marginalization of these local languages, in the case of the Sebakwe Environmental Education programme, the Shona and Ndebele languages, therefore constitute a barrier to the promotion and use of indigenous knowledge in the programme.

However it was pointed out that there are times (even though very few times) that Sebakwe Environmental Education programme staff have used local languages during learning activities. Of importance to this is the fact that the educators discovered that whenever learners are allowed to converse in their own language their level of participation improved (AM5). Masuku (1999) noted the same, when she observed that learners and teachers’ confidence and participation improved when working with familiar issues (local) and through their own local language. What it therefore means is that even if English language is the main medium of instruction, there are still possibilities of promoting the use of local languages within the learning processes and thereby create room for further incorporation of indigenous knowledge into the Sebakwe Environmental Education programme. SEEP educators can learn from the few instances that they have used local languages and build from those experiences in finding out how to open up more opportunities for the use of local and marginalised languages.

5.6 Persistent domination of Western scientific knowledge and marginalization of other knowledge forms

Analytical Statement 6: The persistent domination of Western scientific knowledge over other forms of knowledge that is prevalent within the Sebakwe Environmental Education programme is in itself a challenge for the integration of indigenous knowledge systems into the education programme's learning categories

It also came out that within the Sebakwe Environmental Education programme the main knowledge system that is considered valid and relevant to both the learners and the teachers is western scientific knowledge (See section 4.5). As already highlighted (in section 5.5) the domination of local epistemologies by western scientific knowledge systems is linked to;

- The facts that as an environmental education programme, the Sebakwe Environmental Education programme (SEEP) is by orientation demanded to support learning of environmental science related concepts, and help to contribute to learners' improved pass rates in their final examinations. (AM 6) The Zimbabwean education system to which SEEP is supposed to complement has remained westernized, content based and examination oriented even after gaining independence (Mandikonza, 2007 and Zvobgo, 2007). On the other hand indigenous knowledge systems have not yet received recognition within the modern and current examination systems (Bowers, 2001).
- Secondly local people (indigenous communities) as already pointed out still perceive their own cultures, knowledge systems and traditions as inferior to the western scientific knowledge forms (Sibanda, 1999). Shava (2005) alerted us to the stigmatization and negative attitudes tied to indigenous knowledge. It is therefore not amazing that within the context of Sebakwe Environmental Education programme and the Sebakwe community this negative attitude towards and stigmatization of indigenous knowledge maybe one of the challenges that stand in the way of any meaningful effort to achieve the integration of indigenous knowledge into the Sebakwe Environmental Education programme.

In general the relevance and value of the knowledge forms that plays out in the Sebakwe Environmental Education programme remains judged on the basis of the national examination system and as such the use of indigenous knowledge systems in the programme will not be any easy to achieve. I see this as not only a challenge for efforts to achieve epistemological pluralism within the Sebakwe Environmental Education programme but also for the entire conceptualization and focus of the entire environmental education scheme as a response to the worsening ecological crisis. The key question we should probably be asking ourselves as environmental educators is should we educate to help learners pass academic tests or to help them to cope with their everyday environmental issues and risks? Our answer to this important question will greatly help us to negotiate our relationship (and environmental education programme's relationship too) with national education systems and thus further assist us to either be environmental educators or just educators. There is of course a thin line between the two views.

5.7 Conclusion

It is within this chapter that I realized how important the literature review process was. I drew heavily from the theoretical insights gained during the literature review process to draw the meaningful conclusions outlined in this chapter (Berg, 1998, p. 230). I used the theoretical insights gained from literature to search for meaning from the analysed data. As researcher I also saw how important it is for one to do a thorough review of relevant literature in order to improve the validity of one's research findings.

From this chapter I then moved on to chapter six, where I used the knowledge and insights gained from the data interpretation to frame some guiding recommendations for the possibilities of working with indigenous knowledge systems in the Sebakwe Environmental Education programme's central learning categories.

Chapter 6

Synthesis and Recommendations

6.0 Introduction

Chapter six is the final chapter of this research report. In this synthesis chapter I develop recommendations and guidelines out of the research process to guide the integration of indigenous knowledge into the Sebakwe Environmental Education programme. In drawing these recommendations out of the research I draw on all the experiences, knowledges and insights gained throughout the entire research process.

One more important point to make is that the recommendations presented here must be seen as both tentative and specific to the Sebakwe Environmental Education programme. This is because this research was first and foremost conceptualised within the context of the Sebakwe Environmental Education programme as outlined in chapter one (section 1.3). However other similar environmental education programmes might still learn from and draw on the recommendations hereby presented, as they strive to enhance epistemological pluralism in their learning processes.

6.1 Recommendations for the integration of indigenous knowledge systems into SEEP

In order to promote use of and integration of indigenous knowledge systems (content and processes) into the Sebakwe Environmental Education programme's learning interactions there is need for the programme to become more orientated towards a multi-cultural and bio-cultural approach to environmental learning. Such an approach could help strengthen or align the linkages between the nature-based (bio-centric) curriculum predominant in the existing education programme and the cultural-based curriculum inherent within the Sebakwe community but not yet adequately integrated into teaching and learning interactions. In order for that to happen, the following recommendations have emerged from this study;

6.1.1 Researching and documenting IKS within the Sebakwe community

There is need for the programme staff (EEO and support staff) to continue researching and documenting the local indigenous knowledge systems and practices available within the Sebakwe community. Such issues should include finding out how local people are coping and responding to the inherent environmental education issues and risks. For instance it is worth researching how the people cope with the absence of modern sanitation facilities and prevent the outbreak of water borne diseases such as cholera, dysentery or typhoid. During the data collection processes some of the indigenous knowledge systems inherent within the community were discussed (see section 4.6) but those were only a few examples. Once a comprehensive inventory of the knowledge systems and practices used in the area is produced it should be possible and probably easier to include them in the school environmental camp curriculum. This way learning will become more relevant to the learners as they, in addition to developing scientific environmental knowledge, also gain knowledge and skills needed to help them fit and function properly within their own societies.

It emerged during the data analysis and interpretation processes that the Sebakwe community is rich in indigenous knowledge but to ensure a coordinated use of these knowledges and practices the need to continue documenting them (and ensuring that they do not risk getting lost due to breakdown of intergenerational mechanisms) can not be over-emphasised.

Multiculturing SEEP's school environmental camp programmes

There is also need to emphasise and take into consideration learners socio-cultural backgrounds when developing the school environmental camps. The cultural diversity in the Sebakwe community requires that the camp programmes (curriculum) should be sensitive and responsive to these diverse cultures and knowledges. Therefore both the knowledge systems and the teaching and learning processes (pedagogic relevance) must respect and relate to learners' socio-cultural backgrounds. An example is that, because indigenous knowledge systems are diverse and culturally bound (both in its constitution and generation) there is need for the educators to respect the fact that there is absolute knowledge. And that, all knowledge systems are contested, emergent, and dynamic (Lather, 1991, p.14). In practice it would mean that the educators must accept learners' different views and experiences of the environment and how to cope with the environmental issues and

risks. The challenge is that such an approach to environmental education will demand a lot of critical thinking and careful planning prior to and during each school environmental camp. It is only through this critical approach to school camp development (curriculum) that indigenous knowledge systems and practices can find use within the Sebakwe Environmental Education programme. Through this the school camp programme will be contextualised and made more responsive to local environmental issues and risks (Cornbleth, 1991).

Adapting learning support materials to suit context

More effort is needed to adapt the available learning support materials in order to contextualise these and take cognisance of the indigenous knowledges inherent within the Sebakwe community. Currently there is a shortage of learning support materials that were produced within the context of the newly resettled community of Sebakwe. Therefore there is urgent need to adapt the available environmental games, puzzles, word searches, indigenous knowledge booklets, wall sheets and fact sheets to suit the local context. A good example is the eco-footprint game which is often used in the school camps. Whilst this game is a very good way of challenging learners to critically look at the impact of their daily life styles to the environment, the game does not probe locally relevant issues but issues related to urban life. And because children from the local community do not know much about urban life, using the eco-footprint game in its current composition does not help the local learners much. Adapting the eco-footprint game to probe local communal and farming related life styles will greatly make the learning more relevant and has potential to bring into the learning arena locally relevant knowledge systems and practices.

Community elders as environmental educators

As a way of recognising the status of community elderly people there is need for the Sebakwe Environmental Education programme to invite local elderly people within the Sebakwe community to participate in the camp programmes. These elderly people are potential repositories of indigenous knowledge and their participation in the mainstream environmental education programmes can help strengthen the status of local knowledge within the education system. Status of knowledge possessed by local elderly people needs to be enhanced as it has been overwhelmed by the dominant western knowledge (Shava, 2000). Local elderly people must be given a chance within the Sebakwe Environmental Education programme to come and be the teachers. Such an initiative may also help to bring

back the African traditional education system in which every community elder was a teacher (Shava, 2000 drawing from Julius Nyerere (year unknown)'s comment about traditional education systems). Making room for local people to participate actively in the Sebakwe Environmental Education programme will further help to reverse the inferiority complex attached to local knowledge that is prevalent in the community. It will also help learners to recognise that even if indigenous knowledge is not directly examined it is still very useful in every day life.

Use of local languages within learning processes

Language plays an important role in knowledge generation (Vygotsky, 1987 cited in Daniels, 2001). And because indigenous knowledge come to be embodied through language it is therefore very important for the Sebakwe Environmental Education programme to create an enabling environment for use of learners' mother languages in the teaching and learning processes. By doing that, learners will be given opportunities to learn in a way that is culturally inherent, and does allow them to use their own local knowledge systems (Agyeman, 2002). It has already been observed that learners and teachers are usually motivated when they use their own language and learn about their own local matters (Masuku, 1999). Thus the need for the Environmental Education programmes such as SEEP to plan the learning processes in a way that allows learners to use their own local languages is critical. Use of local languages is critical at this stage because other than helping learners to express themselves confidently it will also make it possible for local elders to participate in the learning processes.

Community and family participation and complementary initiatives outside the Sebakwe Environmental Education programme is also needed to ensure local languages are accepted within the learning processes. Both the parent community of Sebakwe and the educators involved must put an effort to use local languages (Shona and Ndebele) with pride so that rejuvenation of these marginalised languages within SEEP is not confined to young people in schools but becomes a part of a broader society, where indigenous languages are used, accepted and spoken with pride (May & Aikman, 2003). Therefore in practice there is need for Sebakwe Environmental Education programme to involve the entire community within the process of working towards the integration of indigenous knowledge into the programme.

Use of traditional teaching and learning methods

There is also need to consider and promote the use of traditional methods of teaching and learning (Shava, 2005). Such methods in the case of the Sebakwe Environmental Education programme includes, traditional folklores, proverbs, idioms, ceremonies and rituals, song and dance, observation, and learning by doing. These are the methods through which knowledge and skills were passed onto the young generation over the years. In general these methods are participatory, and often allow learners to learn in a way that is suited to their cultural background, age and intellectual potential. It should be very possible given the organisation and structure of learning within the Sebakwe Environmental Education programme, to plan school camps with a focus on using some of the identified traditional teaching and learning methods. What is therefore required is for SEEP staff to consider going into the community and research on how children learn (the methods) and then try to use the experiences to bridge the gap between learning at home (non formal) and learning at school (formal). (Such a move could also help the programme attain the bio-cultural approach to learning as mentioned in section 6.1.) This could be easily done by adapting the already existing teaching and learning methods.

Holistic approach to environmental education learning

The Sebakwe Environmental Education programme should also continue to devise teaching and learning methodologies that are holistic and enquiry based in orientation (Fien, 1993). The holistic approach to environmental education could make it possible for educators to bring into the learning the social, political and economical factors that determine and influence the environmental issues and risks inherent within the Sebakwe community. A holistic approach to education can also help to strengthen the weak link between the home, the school and the community, so much that what is learnt within an environmental education programme like SEEP relate to and complement what is learnt within the learners' homes and communities (Taylor & Mulhall, 2001).

O'Donoghue (1995)'s broader concept of what constitute the term "environment" can help make environmental learning more holistic. (See figure 6.1)

A broader perspective of the Environment

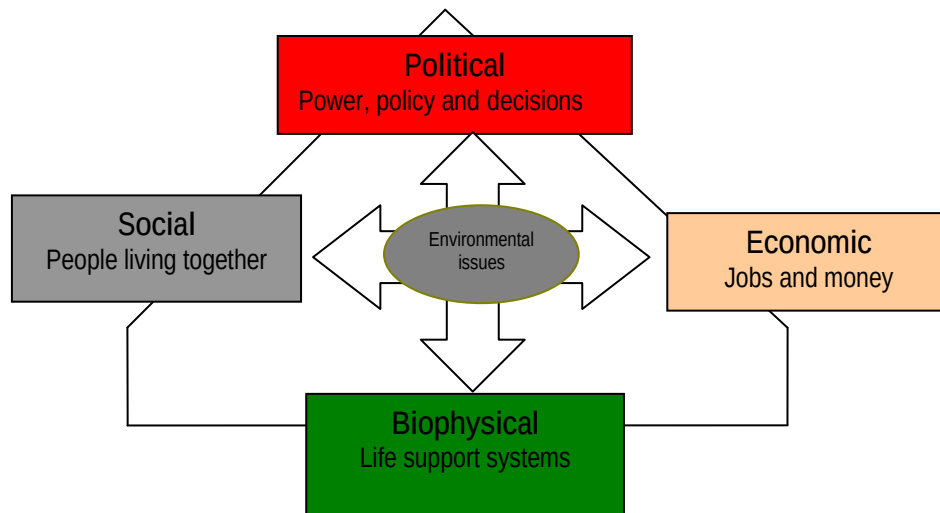


Diagram adapted from O'Donoghue (1995, p. 08)

Using the broader concept of the environment can open up more space for learners to discuss and learn about things such as cultural beliefs, myths, norms and values. Learners need to appreciate the fact that environmental issues and risks such as wildlife depletion, poaching, deforestation and soil erosion only to mention a few are influenced by people's everyday life styles (cultures), their social, political and economic structures. If a community depends on hunting and gathering then the environmental issues and risks experienced in their areas can only be understood and resolved by taking a holistic look into their everyday hunting and gathering styles. Approaching environmental education holistically will provide room for learners within the Sebakwe Environmental Education programme to apply their own local knowledge systems and practices (UNESCO, 1977 and Lotz-Sisitka, 2006).

6.1.8 Socially critical approach to assessment

In view of the relationship between the Sebakwe Environmental Education programme and the national education curriculum, with its technocratic and academic assessment system, there is need for SEEP to consider adopting a socially critical approach to assessment. According to Fien (1993, p.24) socially critical approach to assessment enables both teachers and learners to negotiate assessment processes and most importantly for environmental education allows assessment to take place around evidence of contribution to action and critical response to social-political, context of school, community and the environment. The Sebakwe Environmental Education programme as

embedded in its conception was meant to help the Sebakwe community to respond to and cope with the inherent environmental and health issues and risks thus its relevance and impact should be judged on the basis of how the education programme is responding to those issues and risks and not *only* on how it will help learners to pass the academic examinations. However it should be noted that this recommendation is not an attempt to undermine or disvalue academic enquiry but to try and balance it with locally responsive knowledge systems and practices.

6.1.9 A precautionary remark

There is however need for the implementers of the Sebakwe Environmental Education programme to be cautious as they seek to incorporate indigenous knowledge into the programme. It should be borne in mind that as earlier on referred to in the literature review educators must be careful of not falling into the trap of dichotomising knowledge systems and thus seeking to promote one at the expense of the other. Whilst we appreciate that there is apparent marginalisation of indigenous knowledge in the Sebakwe Environmental Education programme we should also appreciate and recognise the value of other knowledge forms e.g. the dominating western scientific knowledge systems. What we therefore should seek to achieve is a situation where both the western scientific knowledge and the local indigenous knowledges compliment one another and make learning more relevant (Mandikonza, 2007). What is needed is “inter-epistemological dialogue” not “elimination” of one form of knowledge in favour of the other.

Therefore it is important to keep in mind that even if the focus of this research seemed to be skewed in the direction of strengthening efforts to integrate indigenous knowledge, it is by no means implying that the current western and scientific knowledge system that is dominant in the programme’s five learning categories is valueless.

6.2 Conclusion

Achieving the meaningful inclusion and use of indigenous knowledge systems (content and process) within the current formal Sebakwe Environmental Education programme seems a slow and challenging process. There are, as revealed in this research, both opportunities and challenges for the integration of indigenous

knowledge into the Sebakwe Environmental Education programme. This study has also opened up other questions, some of which were outside the methodological reach and the initial scope of the study, suggesting that more research is necessary to further explore how each of the opportunities and challenges identified could be worked with in re-orienting the Sebakwe Environmental Education programme towards becoming contextually responsive in terms of both epistemology and pedagogy.

It is important to note that the recommendations emerging from this study are not exhaustive and are in most cases tentative perspectives that can be used to further refine and develop more guidelines for working with indigenous knowledge in ways that complement the current nature-based environmental learning that is taking place within the Sebakwe Environmental Education programme.

Working within the limited scope of this research project I was excited with the emergence of evidence for the possibility of incorporating indigenous knowledge systems into the Sebakwe Environmental Education programme. This was my aim and hope at the onset of the project. The Sebakwe Environmental Education programme has always had a strong biological and ecological focus and paid very little attention to the socio-cultural context of the learners. It is thus satisfying that this exploratory research on indigenous knowledge systems in the area has opened up and is now paving the way for a strengthening of environmental learning within the Sebakwe education programme, as a situated and bio-cultural process.

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Appendix 2.1

Zimbabwe's National Environmental Education Policy (NEEP)

See principle 10 on IKS and EE and Objective 10 at the back

Principles of Environmental Education

2.4 Principles of Environmental Education

Effective EE in Zimbabwe should:

1. Consider the environment in its holistic nature and thus have an interdisciplinary focus to cover the biophysical, socio-cultural, economic and political elements;
2. Be a continuous life-long process commencing at early childhood learning and continuing through all formal, non-formal and informal stages to develop environmental sensitivity at all stages;
3. Focus research on priority needs identified through a collaborative process;
4. Conduct research with active participation of potential beneficiaries as well as investigated communities;
5. Examine critical local, national, regional and global environmental issues within their socio-economic and historical contexts;
6. Promote the value of local, regional and international cooperation in the prevention of and solution to environmental problems;
7. Consider environmental issues in planning for development and growth;
8. Facilitate equal partnerships and opportunities in the process of decision making at all levels and stages;
9. Empower all people and promote opportunities for grassroots democratic change and participation, thereby enabling communities to regain control of their own destinies;
10. Recover, recognise, respect, reflect on and utilise indigenous knowledge systems as well as promote cultural, linguistic and ecological diversity;
11. Help learners discover the symptoms and diagnose the causes of environmental problems to enable them to participate actively in sustainable environmental management;
12. Utilise diverse learning environments and a broad spectrum of educational approaches to teaching and learning;
13. Integrate knowledge, skills, values and actions;
14. Value different forms of knowledge;
15. Stimulate dialogue among individuals and institutions in order to create new lifestyles based on meeting everyone's basic needs regardless of ethnic, age, gender, class, physical or mental differences;
16. Transform the mass media into a main channel of information committed to the interests of all sectors of the society.

Objective 10 of the ZNEEP which focuses on IKS and how it can be promoted.

Objective 7:

To protect and promote the use of indigenous knowledge systems.

Strategies

1. Build on IKS with local communities.
2. Identify appropriate aspects of IK and integrate them in the formal education curricula.
3. Involve local communities in EE programmes in educational institutions.

Actions

1. Set up an EE council in each institution.
2. Produce a calendar of EE activities together with the community.
3. Research, document and select IK supportive of sustainable living practices.
4. Incorporate appropriate IK in the formal education curricula at all levels.
5. Hold regular meetings to share ideas on integration of IK materials.
6. Include traditional leaders in EE processes in order to uphold cultural and traditional values.

Appendix 3.2 Consent form

Group Consent and Agreement of confidentiality form

This form is intended to ensure that all the participants of this research project have been given adequate information on the purpose of, and on the implications of participating in, the research entitled;

Exploring opportunities and challenges for achieving the integration of indigenous knowledge systems into Environmental Education processes: A case study of the Sebakwe Environmental Education programme (SEEP) in Zimbabwe.

I hereby sign this form to indicate that I have freely agreed to participate in this research project. I further promise that I will not use the data generated in this research for any other purpose other than this research or discuss the data with anyone outside my fellow focus group or workshop members and the researcher

All the invited participants are hereby asked to read and sign this form indicating that they have agreed to comply.

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

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Name _____ Signature _____

Appendix 4. 1 SCp2

Sebakwe Environmental Education programme
School Bush Camp programme: Gutsaruzhinji Primary school
Dates: 12 – 15 September 2005

Day 1

Arrival and house keeping issues

Wildlife video & Discussion: The super predators

Lecture on the status of black rhinoceros population in Zimbabwe: The rhino file

Approaches to bird identification (in preparation for Day 2 early morning bird walk)

Volley ball game

Day 2

Early morning bird walks into the conservancy

Environmental Game: Malusuthe's farm (and discussion on common environmental issues)

Introduction to basic Ecology (Lecture)

Wildlife video: The Okavango magic (reinforcing learnt ecological concepts)

Campfire (story telling activities to be done after dinner)

Day 3

Early morning bird walk

Field-work: identification of tree species and animal species common in the MBRC

Open lecture on uses of trees and plant species common in the MBRC

Water audit (Learning how to determine the quality of river and open pools water)

Wildlife video (after dinner): a film of their choice)

Day 4

Early morning game drive (enjoying nature)

Lecture on common snakes of Sebakwe (To be presented by Mr. Skipwith)

Wildlife Quiz (to assess level of knowledge gained)

Cleaning of our dormitories and centre premises

Bon voyage: Go well: Famba zvakanaka!!!!

PLEASE NOTE

1. This Programme can be adjusted where necessary to suit the interests of the visiting school
2. All schools to make sure learners bring their own toiletries and personal medical requirements
3. Food will be provided but learners can bring their own additional foods
4. Remind your learners to bring walking shoes and sunhats for field activities and game drives

Appendix 4.2. Quiz Questions

ROUND 1

1. When a fly takes off does it
A. JUMP BACKWARDS **B. JUMP FORWARD** **C. JUMP STRAIGHT UP**
2. Where are the butterflies taste buds
A. ON THEIR HEADS **B. ON THEIR FEET** **C. ON THEIR FEELERS**
3. A chameleons tongue is
A. AS LONG AS ITS BODY **B. HALF THE LEGTH OF ITS BODY**
C. TWICE THE LENGTH OF ITS BODY
4. An insect has competed with man for food from ancient times. It is
A. FLIES **B. LOCUSTS** **C. BEES**
5. Which animal has the highest blood pressure. Is it
A. ELEPHANT **B. HIPPO** **C. GIRAFFE**
6. What gas do trees produce that is essential for animals and humans to survive?
A. OXYGEN **B. CARBON DIOXIDE** **C. NITROGEN**
7. The three basic types of high clouds are composed of
A. SMOKE **B. ICE CRYSTALS** **C. SNOW**
8. Which type of protected area is Gonarezhou. Is it
A. NATIONAL PARK **B. SAFARI AREA**
C. RECREATIONAL PARK
9. Are specially protected plants in Zimbabwe most threatened by
A. COLLECTION FOR GARDENS **B. TRADITIONAL MEDICINE**
C. HABITAT DESTRUCTION

Appendix 4.3 AM1

Analytical Memo 1 (AM1)

Summary of data relating to structure and organisation of the Sebakwe Environmental Education programme (SEEP) that came from the document analysis (DGph 1), focus group interviews (DGph 2) and workshop (DGph 3). **Italicised, bolded and underlined text represents areas that might present challenges for IKS use.**

Category/Theme	Brief summary of data	Traceable sources of the data
Structure and Organisation of Sebakwe Environmental Education programme	Programme run in the form of school bush camps	DGph 1- SCECb, SCp 1, SCp2, S1, T2 in DGph 3
	- Learning is organised into five learning categories; <u>Lectures</u> - Field based interpretation - Campfire (story telling) <u>Wildlife videos films</u> - Environmental games/<u>QUIZZES</u>	DGph 1- SCECb, DGph 2- S1, S2 S3, S4, S5
	Participatory approaches to curriculum (bush camp programme development)	DGph 2- S1 & S2 and T1 DGph 3- T1, S1
	Flexibility in camp programme constitution. Different camp programmes for different school groups	DGph 1-SCp1, SCp2
	Key observations	- The organisation of SEEP is flexible and learning is through school bush camps programmes - The school camp programme is designed in a participatory way. - The learning categories presents both challenges and opportunities for IKS use