

**Government Environmental Education Programmes and  
Campaigns (EEPCs) in Mozambique: The role of  
Indigenous Knowledge and practices**

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## DECLARATION

I declare that this study entitled

Government Environmental Education Programmes and Campaigns (EETCs) in  
Mozambique: The role of Indigenous Knowledge and practices

is my own work that all the resources I have used or quoted have been indicated  
and acknowledged by means of complete references and that neither I nor  
anyone else at this University or any other educational institution previously  
submitted this study for degree purposes.

Ana Wamir Da Conceição

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Date

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## **DEDICATION**

This thesis is dedicated to my late father Romão Wamir who taught me to be confident and persistent in the struggle for success and fruitful living. God protect and bless him!

## ACKNOWLEDGEMENTS

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## TABLE OF CONTENTS

Declaration.....	
I	
Dedication.....	
II	
Acknowledgements.....	I
II	
Table of Contents.....	V
List of figures.....	
IX List of pictures.....	X
List of tables.....	XI
Index of acronyms and Abbreviations.....	XII
Summary.....	XI
V	
Keywords.....	X
V	

CHAPTER ONE .....	1
1. BACKGROUND OF THE STUDY .....	1
1.1 Introduction.....	1
1.2 Statement of problem .....	3
1.3 Aim and objectives of the study.....	5
1.3.1 General objective .....	5
1.3.2 Specific objectives .....	5
1.4 Research questions.....	6
1.5 Rationale .....	6
1.6 Contribution and significance of the study .....	8
1.6 Study outline.....	10
CHAPTER TWO .....	11
2. LITERATURE REVIEW .....	11
2.1 Introduction.....	11
2.2. Role of education in enhancing environmental programmes.....	11
2.3. Environmental awareness for knowledge integration .....	17
2.4 Environmental awareness and consciousness through education .....	19
2.5. Relevance of integrated knowledge on environmental education.....	24
CHAPTER THREE.....	34

3. METHODOLOGY.....	34
3.1 Introduction.....	34
3.2 Research design .....	34
3.3 Research approach .....	35
3.4 Description of the field and selection of the research sample.....	36
3.4.1 Characteristics of area of study .....	36
3.4.2 Obtaining permission for data collection .....	38
3.4.3 Selecting the sample .....	42
3.5 Data collection process .....	43
3.5.1 Data collection techniques.....	43
3.5.1.1 Field observation .....	45
3.5.1.2 Unstructured interview.....	46
3.5.1.3 Document analysis .....	46
3.5.1.4 Supplementary techniques .....	46
3.5.2 Observation.....	47
3.5.3 Conducting interviews .....	49
3.5.4 Analysing documentary data .....	51
3.6 Procedure for data analysis.....	52
3.7 Validity and reliability.....	53
3.8 Limitations and ethical issues.....	54
3.8.1 Limitations.....	55
3.8.2 Ethical principles.....	55
CHAPTER FOUR.....	56
4. THE STORY OF ENVIRONMENTAL EDUCATION PROGRAMMES IN LOCAL COMMUNITIES IN MOZAMBIQUE: THE CASE OF THE NACALA- PORTO DISTRICT .....	56
4.1 Introduction.....	56
4.2 The story of the national environmental education programmes in Mozambique.....	56

4.2.1 Nature and rationale of EEPs.....	57
4.2.2 The local community's knowledge about environmental protection and conservation .....	64
4.2.3 The involvement of local people and their knowledge in EEPs .....	66
4.2.4 The local community's reactions to EEPs .....	68
4.3 EEPs at the district level: the case of Nacala- Porto.....	72
4.3.1 Structure and rationale of the environmental education programmes in Nacala-Porto district .....	73
4.3.2 Local community's knowledge about natural resource management and protection .....	78
4.3.3 Local community's involvement in the development and implementation of EEPs.....	83
4.3.4 Local community's perceptions of and reactions to EEPs .....	85
CHAPTER FIVE.....	93
5. SUMMARY OF FINDINGS, DISCUSSION, CONCLUSION AND RECOMMENDATIONS.....	93
5.1 Introduction.....	93
5.2 Summary of findings.....	93
5.3 Discussion of the findings.....	95
5.3.1 Local communities' knowledge and environmental conservation: the case of the Makua local community.....	95
5.3.2 Incorporating local communities' knowledge and practices in environmental education programmes.....	98
5.3.3 Perceptions and reactions of local communities with regards to EEPs.....	109
5.4 Recommendations and policy implications.....	112
5.5 Limitations and future studies.....	114
5.6 Conclusion.....	115
6. REFERENCES.....	117
7.APPENDIXS.....	125



Appendix A: Letters, requesting permission to collect data at the MICOA.....	126
Appendix B: Confirming that I am student at the University of Pretoria .....	127
Appendix C: Letter of consent for collecting gata.....	128
Appendix D.....	129
Appendix E.....	130
Appendix F.....	131
Appendix G.....	134
Appendix H.....	135
Appendix I.....	136
Appendix J-a.....	137
Appendix J-b.....	139
Appendix L.....	141

## LIST OF FIGURES

Figure 1: How environmental consciousness can lead to poverty alleviation.....	23
Figure 2: Framework for integrated knowledge on environmental education programmes.....	31
Figure 3.1: Mozambique and its provinces.....	37
Figure 3.2: Nampula province and its districts.....	38
Figure 4: Data collection techniques.....	44
Figure 5: Barrier Method used by Makua local communities to combat soil erosion .....	81

## LIST OF PICTURES

Picture 1: Traditional technique used to prevent soil erosion and as fencing material.....	80
Picture 2: Traditional technique used to prevent soil erosion.....	80
Picture 3: Traditional technique used to prevent soil erosion.....	82
Picture 4: Municipal activity for an EEPs in co-ordination with the local community to combat soil erosion in the Nacala district.....	88
Picture 5: Installation destroyed by some members of the community just weeks after its building in Nacala-Porto district.....	89

## LIST OF TABLES

Table 1: Outline of the study and content of the chapters.....	10
Table 2: Data collection techniques for each research question and respective target group.....	45

## ABBREVIATIONS

CAF	Conserve Africa Foundation
CAQDAS	Computer Assisted Qualitative Data Analysis Software
CNDS	National Council for Sustainable Development
CSOs	Civil Society Organizations
DANIDA	Danish International Development Agency
DNGA	National Department for Environmental Management
DDGA	District Department for Environmental Management
DFID	Department For International Development (UK)
EE	Environmental Education
EETC	Environmental Education Programmes and Campaigns
JPRF	John Prince Research Forest
IKS	Indigenous Knowledge System
MICOA	Ministry for Coordination of Environmental Action
MDGs	Millennium Development Goals
NEPAD	New Partnership for Africa's Development
PNGA	National Program for Environmental Management
PC	Programmes and Campaigns
SD	Sustainable Development
SARPN	Southern African Regional Poverty Network
SADC	Southern African Development Community
SKS	Scientific Knowledge System
TEK	Traditional Ecological Knowledge
TK	Traditional Knowledge
WSSD	World Summit on Sustainable Development
WWF	Worldwide Fund for Nature
UN	United Nations
USAID	United States Agency for International Development

UNCED	United Nations Conference on Environment and Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme

## SUMMARY

Faced with dynamic and rapidly deteriorating environmental conditions, the government of Mozambique has embarked on environmental education programmes and campaigns (EETCs) as a strategy for natural resource management and environmental conservation. However, there is increasing evidence to suggest that the implementation of these EETCs in local communities are often lacking when it comes to community participation and contribution. The latter has often been cited as a major reason for the limited success of such EETCs. To date there is little research work that explores the issues on the integration of local community Knowledge and practices, and community reactions to such environmental education programmes and campaigns anywhere in the world. Mozambique, a developing country in Africa, is no exception to this trend of ignorance.

This research investigated the extent to which local knowledge and practices are integrated into The EETCs that are implemented by the government of Mozambique. The focus was on the local community's perceptions, engagements and reactions to the EETCs. The study was conducted in four districts of the Nampula province in Northern Mozambique. The data were collected through in-depth interviews, documentary analysis and non-participant observations. The findings of the study showed that there is a lack of substantial involvement by the local community in all stages of the development process of the EETCs. Furthermore, the study found evidence of partial and /or unsuccessful implementation of the projects in all four communities studied.



The research concluded by arguing that without such active involvement of the local people in planning, designing, implementation, monitoring, evaluation and decision-making processes of EEPs, the frustrations of government officials and the lack of substantial implementation of the projects in the communities that were studied should not have come as a surprise.

## **KEYWORDS**

Environmental education

Programmes

Awareness

Rural community

Indigenous knowledge

Natural resources

Management

Conservation

Participatory approach

## **CHAPTER ONE**

### **1. BACKGROUND OF THE STUDY**

#### **1.1 Introduction**

Mozambique is a developing country in Southern Africa that is still facing serious economic difficulties. About 80 percent of the Mozambican population lives under the absolute poverty line, with the majority of these poor in rural areas (Miller, Esselaar & Associates, 2001; DFID, 2003 and SARPN, 2004). The rural communities depend mostly on subsistence agriculture, fishing and exploitation of forest products (USAID, 2000). The exploitation of forest resources and slash-and-burn farming practices often lead to deforestation, forest fires, increased soil fertility loss and the destruction of natural habitats, while subsistence-fishing methods lead to destruction of marine ecosystems.

To mitigate these environmental degradation problems, the Mozambican government developed a national environmental education strategy, which focuses on educating the society and raising public awareness, as suggested in

chapter 36 of Agenda 21<sup>1</sup> (Agenda 21, 1992 and CNDS, 2002). Agenda 21 recommends that environmental policies and programmes, with particular reference to the conservation and protection of natural resources, should target those who rely on the environment for subsistence for public awareness and education (United Nations, 1992; CNDS, 2002; and Robitaille, Dupré & Lafleur, 2002).

At present, education and literacy levels in Mozambique are still relatively low (DFID, 2003 and SARPN, 2004). Rural communities still rely largely on their Indigenous Knowledge Systems (IKS) and practices, which are passed on from generation to generation within the communities. In this context, for the national environmental education strategy to succeed, it needs to recognise, respect and harness the IKS and practices of rural communities, within its frameworks and programmes. Environmental educators are therefore expected to play an important role by incorporating IKS into their educational programmes in order to foster growth in environmental literacy at the community level (Robitaille, Dupré & Lafleur, 2002).

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<sup>1</sup> Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations system, governments, and major groups in every area in which human impacts on the environment (United Nations, 2005).

Most environmental education experts recognise the importance of four overlapping and essential educational components, namely awareness, knowledge, values and ethics, in developing and implementing environmental

education programmes and campaigns (EEPCs). Moreover, environmental education programmes need to involve not only human activities in the real world, but also attitudes, beliefs and experiences to build up the necessary educational components (Chambers, 1995). However, any development education programme that proceeds without community participation and consideration of the community's cultural values is likely to be self-defeating because of the potential loss of the contribution of this vital resource (Trail & James 1995; and Sheckley & Kehrhahn, 2000). In addition, national environmental education programmes that aim to raise environmental awareness, build knowledge, values, attitudes and skills need to include peoples' participation and contribution into its programmes (Robitaille, Dupré & Lafleur, 2002). To reach this goal, it is necessary to understand cultures, motivate people, increase schooling, promote adult education and creativity and create space for critical thinking in communities (Merriam & Mohamad, 2000; Sheckley, 2000; and Robitaille, Dupré & Lafleur, 2002).

However, in most cases, national EEPCs are often lacking when it comes to community participation and contribution. Some of the major reasons for this state of affairs include lack of understanding about IKS, lack of appropriate models for programmes that actually consider IKS and lack of trained and qualified staff, pedagogic materials, partnerships and technical support. The lack of knowledge is mainly due to an absence of adequate research and documentation on rural local knowledge systems and practices. Similarly, very few models combine 'scientific' and indigenous knowledge in EEPCs (Merriam &

Mohamad, 2000; Sheckley & Kehrhahn 2000; and Robitaille, Dupré & Lafleur, 2002).

It is against this background that this study was undertaken, which aims explore the nature of and the rationale behind the environmental education programmes and campaigns (EETCs) conducted by the Ministry for Coordination of Environmental Action in Mozambique (MICOA). It aims, also, to provide insights about the design and implementation of such environmental education programmes not only in Mozambique but also in rural communities in other similar developing countries. The study proposes to examine two EETCs implemented by MICOA on soil erosion and deforestation, and to explore their potential for resolving the perennial conflict between 'scientific' and local rural knowledge systems in education initiatives.

## **1.2 Statement of problem**

The Millennium Development Goals (MDGs) approved at the United Nations 55<sup>th</sup> Assembly Millennium Summit aim to achieve, among other things, poverty reduction by half and achievement of environmental recovery and sustainability by 2015 in all the poor countries of the world (United Nations, 2002). According to the World Development Report, environmental recovery in all developing countries including Mozambique is crucial for the protection of natural resources, which play a significant part in the sustainability of biodiversity.

Accordingly, former President Chissano of the Republic of Mozambique (RM) pointed out at the World Summit on Sustainable Development (WSSD, Johannesburg 2002) that Mozambique had developed the necessary national laws and regulations to protect the environment. Furthermore, he pointed out that

the country was vigorously conducting awareness campaigns on sustainable development.<sup>2</sup> However, the former President was quick to acknowledge that:

...sustainable development remains elusive and the world continues to be characterized by unsustainable patterns of development that neither protect the environment nor deliver socioeconomic growth and development. On the contrary, poverty, underdevelopment, inequality, pollution, natural disasters and environmental degradation are a few of the sad features we are faced with (Chissano, 2002).

It is clear, therefore, that Mozambique, like many developing countries, cannot escape the need to develop successful programmes and campaigns to educate the community about the environment. Mozambique is, however, one of the world's poorest countries, and her rural communities often source their daily living from the environment, mostly by farming. Exploitation of forest resources and slash-and-burn farming practices of the poor rural communities affect the environment adversely (USAID, 2000; and SARPN, 2004). Such factors as the high illiteracy rate, poverty and inadequate financial resources could affect environmental recovery and sustainability in the country. It is precisely because of these challenges that the national government in Mozambique has embarked on policy strategies and environmental education programmes designed to facilitate the understanding and management of the environment by the rural communities.

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<sup>2</sup> Sustainable development is defined as development that meets the needs of the present without compromising the ability of future generation to meet their own needs (United Nations, 2005).

In spite of these noble goals, however, the dominance of rural local knowledge systems and practices in the country is likely to constrain even the most resourced EEPCs. This is primarily due to poor understanding and the communication gap between the agencies running the environmental education programmes and the targeted rural communities. It is important, therefore, to investigate how the rural communities understand and react to the environmental education programmes implemented by government. Furthermore, research needs to uncover how local knowledge and practices of the rural communities enhance and/or constrain these EEPCs implemented by the government.

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

#### **1.3.1 General objective**

The general aim of the study is to explore the nature of and the rationale behind the EEPCs undertaken by the MICOA. The focus is on the rural communities'

perception of, responses to and engagement with the government's environmental provisions and programmes.

#### **1.3.2 Specific objectives**

The specific objectives of the study include:

- To examine the goals, origins and principles of two environmental programmes implemented by the MICOA;

- To investigate how rural communities interact with the EEPCs implemented by the government; and
- To develop an account of how and why the rural communities engage with environmental education programmes in the ways they do.

#### **1.4 Research questions**

The study addresses the following research questions:

- What is the nature of and rationale behind the two EEPCs (deforestation and soil erosion) undertaken by the MICOA in Mozambique?
- In what ways and to what extent do the programmes and campaigns incorporate the local knowledge and practices of targeted communities?
- How do the local communities respond to the EEPCs and how can their responses be explained?

#### **1.5 Rationale**

The current environmental situation in Mozambique, in particular the increasing loss of natural resources, accelerated exploitation of forest resources and continued land degradation, is still a concern for educators, community business and civil society organizations (DANIDA, 2000; and USAID, 2000). However, Mozambique's government has been vigorously conducting awareness campaigns on environmental recovery (MICOA, 1996; MICOA, 2001 and Chissano, 2002).

In the area of environmental awareness, this situation is not better among Mozambicans, as the country is yet to benefit from significant public interest in environmental regulation and enforcement. This is even more problematic



because Mozambique is poised to host large projects by foreign investors, such as exploitation of natural gas fields, a large aluminium smelter and mining activities. These are natural resource-intensive activities and carry the potential for significant environmental impact. Given the weak institutional capacity and an inability to carry out the required environmental assessments, these projects probably will bring with them further environmental concerns (USAID, 2000).

Environmental awareness is lacking in Mozambique not only among the population and private enterprises, but also among the staff employed by the central administration and local authorities (DANIDA, 2000). Higher awareness will ensure that environmental considerations are respected during the implementation of many industrial projects. For this reason, the lack of attention to essential environmental considerations in some of the larger investment projects is causing concern (DANIDA, 2000). It is evident that there are “gaps” between theory and practice concerning environmental issues and the relationship with the target beneficiaries of the environmental programmes (Mohamah & Merriam, 2000; Cutter-Mackenzie & Smith, 2003; and Fisman, 2005). Against this background, this study’s investigation into how the target beneficiaries, in particular, the rural communities, understand and react to the environmental education programmes implemented by government is imperative. Furthermore, the understanding of the nature and outcomes of EEPC that this research will give is also timely.

Existing research shows that the implementation of environmental education programmes in communities, in general, has limited success. The reasons for these shortcomings are far from clear (Cutter-Mackenzie & Smith, 2003). This study attempted to investigate the possible barriers to effective implementation of EEPCs. In many instances, and for many country settings, there is a dearth of empirical research not only about environmental education in relation to community practices but also on the impact of formal educational programmes on individual’s environmental awareness and concern (Palmer, 1999; and Cutter-

Mackenzie & Smith, 2003). Moreover, there is little work published on people's responsiveness to environmental education programmes and how this, differs across socio-economic status within a society (Fisman, 2005). There is a need for more empirical evidence about the tasks involved in promoting change in attitudes and behaviour in relation to the environment. Research is also needed to uncover how local knowledge and practices of the rural communities enhance and/or constrain these EEPCs.

Furthermore, the genesis of this study is embedded in my interest in the local community's knowledge, since I am an environmental science teacher heavily involved in community environmental projects. In working with communities, I have come across a variety of local environmental practices. I knew that the Mozambican government has carrying out environmental education programmes, and thought it was not only crucial but also timely for me to understand how local communities react towards government strategies on environmental protection and management. For this reason, my study intended to explore the role of local knowledge in environmental education programmes. Exploring this subject in the community, paying attention to the socio-cultural dimension gave me an opportunity to set the general framework of this study. However, investigating traditional knowledge and practices on environmental issues also enabled me to appreciate how rural communities understand and implement the government policies. The present study was therefore designed to investigate the nature and underlying principles of EEPCs in Mozambique.

## **1.6 Contribution and significance of the study**

I hope that the results of this study will give insights into and understanding of the present environmental education programmes in Mozambique and offer suggestions for how to consider social cultural values and integrate IKS and practices into these programmes. Recent studies in the area of EEPCs demonstrate an increased awareness of the need to involve not only the

government departments responsible for implementing EEPCs but also the targeted beneficiaries of these programmes (Puri & Sahay, 2003). The study will thus also serve as reference material for further research studies in related areas.

It is my strong belief that the results of this study will be useful in at least two major ways. Firstly, they may contribute to the process of curriculum review in Mozambique, which seeks to integrate environmental education and indigenous knowledge across the subject as interdisciplinary and intercultural aspects (PNGA, 1996). That is, this study has the potential to transform environmental education into an intercultural and interdisciplinary project that can be utilized in formal education (in schools) and in informal education (among communities). This will help learners and communities to understand why and how culture is an important component of learning in informal education for sustainable development, by identifying the forces that challenge sustainability (Merriam & Mahomad, 2000; and Vargas, 2000). Secondly, this study offers the potential for a better understanding of the available opportunities for bridging the gap between practical and theoretical knowledge in informal education. Such knowledge and understanding of IKS and practices may contribute to the improvement of natural resource protection and management by present and future generations.

## 1.7. Study outline

The study is organized into five chapters, as shown in Table 1.

Table 1: Outline of the study and content of the chapters

<b>CHAPTER</b>	<b>CONTENT</b>
One	BACKGROUND OF THE STUDY: orients the reader to the study by focusing on the introduction, statement of problem, aims and objectives, rationale and significance of the study.
Two	LITERATURE REVIEW: explores the role of education in enhancing environmental programmes and environmental awareness for knowledge integration, and the relevance of integrated knowledge in environmental education, and develops the theoretical framework.
Three	RESEARCH METHODOLOGY: sets out the research design, data collection techniques and the validity, reliability and limitations of the study.
Four	RESEARCH FINDINGS: presents the research findings and analysis of interviews, observations and documentary data
Five	DISCUSSION, CONCLUSION AND RECOMMENDATIONS : provides a summary of findings, discussion of the data, conclusion and recommendations of the study

## CHAPTER TWO

### 2. LITERATURE REVIEW

#### 2.1 Introduction

Until recently, environmental concerns have not been taken seriously by either developing or developed countries. This negligence has caused serious damage to the environment (Kakonge, 1999). Often, efforts aimed at promoting development actually hamper the process of development because policies, strategies and projects do not sufficiently take into account the local environment as an integral part of development planning and implementation (Agenda 21, 1992). Agenda 21 sought to address these weaknesses by proposing a different approach, emphasising sustainable development that should be community-centred, environmentally sound and participatory in nature (Agenda 21, 1992). This requires that people be aware of the environmental effects of their day-to-day activity (Shastri, 2004).

Achieving this entails creating environmental awareness and understanding and suitable technology for sustainable use of resources by the government, stakeholders and other targeted beneficiaries. Within this framework and the scope of this study, this chapter will address the following three relevant aspects:

- the role of education in enhancing environmental programmes;
- environmental awareness for knowledge integration; and
- the relevance of integrated knowledge in environmental education.

## **2.2. Role of education in enhancing environmental programmes**

The majority of reports and strategy documents of the last decade (Robitaille, Dupré & Lafleur, 2002) recognize the vital role of education in addressing the problems of society worldwide. Environmental education is a dimension of education that is interdisciplinary in approach, directed toward problem solving and mainly concerned with local realities. According to Chambers (1995), Palmer (1998) and Fisman (2005), environmental education is understood to include, among other factors, education about the environment, education in the environment and education for the environment. Education about the environment is concerned, mainly, with environmental knowledge and understanding, while education in the environment deals with the development of skills and experiences, and education for the environment involves the development of values and attitudes.

Therefore, we can clearly see that the main goal of environmental education is to develop a population that has the necessary knowledge, skills, attitudes and motivations, which is aware of strategies that can be used and that is concerned about the environment and its associated problems. Accordingly, UNESCO-UNEP (1976) and Fisman (2005) support environmental education seeks to

foster a personal commitment to work toward the solution of environmental problems. In addition, environmental education is also seen as a tool for raising environmental awareness and understanding among human populations and as a provider of knowledge, values, attitudes and skills, all of which are needed to protect the environment (Castillo *et al.*, 2002).

With this in view, Palmer (1999: 379-393) submits that there is an active debate on how to achieve the goals of environmental education, and what the most appropriate strategy for developing and implementing environmental education programmes is. In seeking appropriate strategies, Fien, Scott and Tilbury (2001) put forward four options:

- (i) 'Information provision', a one-way dissemination of conservation messages with the chief purpose of raising awareness of environmental matters;
- (ii) 'Communication', a strategy that evolves dissemination of information as part of a planned two-way exchange of ideas, understanding issues and generating concerns;
- (iii) 'Education', the dissemination of information and communication as part of a process of sharing and learning; and
- (iv) 'Capacity building', concerned with empowering people and communities through acquisition of knowledge (concepts and principles of environmental conservation), development of positive attitudes (personal attitudes and values towards issues of environment) and acquisition of new skills (ability in making decisions, reflecting on possible actions and drawing conclusions).

In the light of this, education is the key social strategy for environmental education programmes, as it carries the process of information provision and communication, leading to people's empowerment. Within this strategic framework, Fien, Scott and Tilbury (2001) argue that activities done in the name of education only become educational when their design and use are embedded within appropriate pedagogical processes that involve people at all stages of life, increasing their understanding, clarifying their priorities and commitment, and developing their skills. Furthermore, Vargas (2000) stresses that these strategies, which are central to the ethos of EE programmes, call specifically for the participation of all segments of society, including the government, civil society groups and individuals.

In the context of sustainable development, people's participation is embedded in education, a key social strategy for environmental conservation that aims to empower people with the necessary knowledge, skills and attitudes to improve their quality of life (Fien, Scott & Tilbury 2001). Ariasingam (1999) contends that sustainable development, which comprises environmental development and protection, can best be achieved through the education of the population of a country. Furthermore, environmental education can be more effective when there is more interaction between formal education at school level and non-formal education at the community level.

Palmer (1999), however, asserts that education is far from realizing its maximum potential in terms of helping people understand and appreciate the environment and their role in its sustainable development. There is thus a challenge for education around the world to increase the store of empirical data through



programmes of high quality research in environmental education (Palmer, 1998).

In view of this, Scones and Thomson (1994) argue that the actual challenge of education is to understand and know how to preserve, transfer and adapt traditional knowledge for present and future generations. In order to achieve this, traditional knowledge has to be intensively and extensively studied, and incorporated into formal education. Furthermore, Kapitza *et al.* (2002) suggest that a fundamental change in education is needed, a move towards creating the desire for environmental protection and respect for human dignity and rights. McNeil (1985) believes that such learning opportunities should fulfil three criteria, namely that education should be real and purposeful; require action; and teach cultural values.

By implication, for education to be real, show action and teach cultural values, it should firstly focus on the aspects of the community, which are believed to make a lasting contribution to the life of the people (McNeil, 1985). Secondly, education programmes should focus on issues and problems relevant to the community. In addition, actions on matters of public concern, which may include working with community groups, informing people about social problems or taking a stand on controversial issues, should be considered (McNeil, 1985). Thirdly, such education programmes should form a coherent system of values. Against this background, the current study seeks to explore the extent to which the EEPCs focuses on issues and problems relevant to the poor rural communities and the extent to which socio-cultural norms and values exert a powerful influence on adult learning in these rural communities.

Freire (1973), likewise, recommends a pedagogical method that recognizes the experience and dignity of students and their culture. In Freire's approach, the educators have to consider and work with the experiences of the students and other learners in order to boost student's knowledge. The pedagogical experience becomes an invitation to make visible the language, the dreams and the values that touch the lives of those whose histories are often actively silenced (Freire, 1985). Education should thus help the individual not only to develop socially, but also to learn how to participate in social planning. Learners also have to see how society makes a people what they are and find ways to satisfy personal needs through social consensus (Freire, 1985). Since education is considered highly critical to the development of a people, the role of educators in the society is vastly important (Gibson, 1999).

As a matter of fact, educators play a significant role in helping society think critically on relevant issues. Accordingly, education is the major tool for mobilizing people, bringing about social change and developing citizenship. These principles from a Freirean approach are very relevant to the awareness and environmental education programmes in communities. Such EEPs can have great impact if they respect and incorporate the local knowledge, experiences and practices existing within the communities. As Freire recommends, education should recognise the experience and dignity of students and their culture. For Freire, the use of his favoured pedagogy, student-centred

method of learning, leads to a “see, judge, act” mentality that promotes critical consciousness (Freire, 1973). Supporting Freire’s idea, Gibson (1999) observes that no education can be neutral; “All pedagogy has to be a call for action” (1).

Given the currently increasing losses of natural resources in Mozambique, through accelerated exploitation of forest resources and continuous land degradation, educating rural communities and other targeted beneficiaries about environmental issues and concerns is vital to help change the attitudes and behaviour of society. It makes sense therefore for us to examine the extent to which the EEPs have incorporated the local knowledge and practices of targeted communities and how the local communities react to these programmes and campaigns.

Cutter-Mackenzie and Smith (2003) stress that education should attempt to improve and protect the environment through producing an environmentally informed, committed and active society, particularly since education is widely believed to be the most powerful tool for addressing environmental challenges and crises worldwide (Orr, 1992, 1994). For this reason a holistic, systematic, more circular and interdisciplinary perspective needs to be included in both formal and non-formal education programmes. Some scholars have argued that education has the crucial task of developing an ethical awareness of all life forms and refining a sense of values (Robitaille, Dupré & Lafleur, 2002). It is also important for education to transmit knowledge, create attitudes and build behaviours that will help people to have a social and educational experience conducive to improving their standard of living.

Environmental education may therefore, be seen as a tool covering a wide range of disciplines, which demonstrates the cause of current environmental problems, and suggests ways to prevent or remedy these problems. Such an interdisciplinary approach can be the best way to deal with the complexity of current environmental problems through the educational processes. The present research study sought to investigate the potential successes and possible constraints of carrying out such a broad inter-disciplinary package of awareness and education programmes among rural communities of Mozambique. The idea was to gain insight into how the rural communities understand, react to and engage with the government's environmental provisions and programmes.

### **2.3. Environmental awareness for knowledge integration**

Since the EEPs of the MICOA are actually designed to create a much broader awareness of the environmental challenges and problems within communities, this review of literature will now focus on some literature relating to environmental awareness programmes.

The importance of environmental awareness has been emphasized in the literature on environmental stewardship since the Tbilisi Declaration of 1977 (UNESCO 1977). This Declaration had three main goals:

- 1 To foster clear awareness of, and concern about economic, social, political and ecological inter-dependence in urban and rural areas;
- 2 To provide every person with opportunities to acquire the knowledge,

values, attitudes, commitment and skills needed to protect and improve the environment; and

- 3 to create new patterns of behaviours of individuals, groups and society as a whole towards the environment (UNESCO, 1977).

According to the Tbilisi declaration, awareness is a necessary precursor to environmental stewardship (UNESCO, 1977; and GDR, 2002). Fisman (2005), in his research in the area of environmental awareness, indicates that many scholars have moved beyond the general categories of the Tbilisi Declaration by providing a framework for understanding how ecological education translates into action through different approaches to education.

In the area of environmental protection, it is adult education, among the possible approaches to education, that should be the primary focus, because it is adult people who make the critical decisions about their daily lives. According to NIACE (1993), the vast majority of citizens, consumers, workers, employers and parents are adults who make critical decisions that affect others and the biosphere, and they do not have opportunities to attend classes significantly. However, recent research in environmental education shows that little attention has been given to developing adult education for environmental protection (Orr, 1992; NIACE, 1993; and Clover, 1996). Most of the literature focuses largely on young people's perceptions and understanding of environmental issues with little or no focus at all on adult learning in environmental education. Moreover, it is known that more than half of all adults in developing countries are not aware of the impact of their activities on the environment (NIANCE, 1993; and Clover, 2003).

A particular focus on the learning and awareness of this neglected group of people with respect to environmental practices is therefore timely and important. The present study explores the nature of and rationale behind EEPs undertaken by the MICOA, and attempts to investigate and understand the rural community's reactions, most especially the adult's perceptions and responses to these environmental education programmes. Studying and assessing environmental education programmes clearly shows that awareness, cultural values and attitudes are relevant variables to consider. In the context of EEPs for environmental protection, these variables are specifically developed within non-formal education and with an approach closely linked to the adults' work.

Since adult people learn more through their experiences, education is critical in helping them to get better understanding of the current environmental crisis through their local knowledge and experiences. In so doing, environmental education should provide opportunities for people to explore their personal responses to environmental issues and to nurture individual attitudes and values (Chambers, 1995). These personal responses relate to not only attitudes and values but also to knowledge, understanding and awareness, which lead to socio-economic improvement through positive social interaction and maintenance of the natural environment.

An environmental education programme that is built on local knowledge can be both appropriate and effective for solving current problems, if it is recognized that local people possess wisdom in dealing with their own environment (Silva, 1996).

The main objective of many environmental education programmes is to increase people's awareness of and sensitivity towards the environment and its problems, issues and challenges. In this context, it is appropriate for this study to adopt a framework based on Freire's consciousness strategy as a way of understanding EE and awareness programmes offered to the rural communities in Mozambique.

#### **2.4 Environmental awareness and consciousness through education**

Awareness in biological psychology can be an internal state such as visceral feeling, or an external event by way of sensory perception that describes an animal's perception and cognition of a condition or event (Wikipedia, 2005). Dourish and Bellotti (1992) describe awareness as an understanding of the activities of others, which provides a context for your own activity. Awareness is people's ability to get and maintain the "big picture" about their environment (Convertino *et al.*, 2004). However, awareness has different stages and does not necessarily imply understanding. One can be partially aware, subconsciously aware or acutely aware. Moreover, awareness provides the raw material from which one does develop *qualia* (qualities or properties as perceived or experienced by a person) or subjective ideas about an experience (Riise, 2004; and Wikipedia, 2005). Environmental awareness is, therefore, the sum total of cognition, attitudes, behaviour, skills and action about the environmental issues (Riise, 2004; and Nunary & Simone, 2004).

Evidence from Campen (1994) and Kakonge (1999) suggests that environmental awareness is one of the ways to search for a solution to the current environmental crisis, an essential step towards promoting sustainable development in Africa.

Sustainable development aims at ensuring a better quality of life for everyone, in the present time and for future generations (CAF, 2004). It requires everyone's consideration of the need for the effective protection of the environment and prudent use of natural resources. Shastri (2004) examines patterns of awareness about deforestation caused by firewood gathering, and finds that sustainable development cannot be achieved without people's participation. People's participation depends upon the spread of awareness (Ariasingam, 1999).

Researchers in the area of environmental education programmes demonstrate that there is usually a lack of awareness and understanding of environmental issues among stakeholders and communities, which is probably the major barrier to sustainable development. There is, therefore, an urgent need to promote and increase environmental education, awareness and understanding of environmental issues with a view to promoting better use of natural resources (CAF, 2004). Awareness and understanding go a long way in helping people to develop and retain a strong sense of culture and identity, which leads to critical self-consciousness. In other words, awareness and understanding constitute the key possible ways of knowing the reality that shapes people's daily lives. Knowing the reality helps people to think critically and therefore makes way for attitude change and new skill development.

Consciousness means being aware and responsive to one's environment (Block, 2004). Accordingly, when one's critical consciousness is raised, the necessary changes in one's values, attitudes and behaviour can occur and new skills can be developed (Block, 2004).



Philosophically, consciousness is a quality of mind that includes subjectivity, self-awareness, sensitivity, sapience and ability to perceive the relationship between oneself and one's environment (Block, 2002; and 2004). The psychology term "consciousness" is commonly used to indicate a state of awareness of self and the environment. Others use the term "consciousness" to indicate all the activities of an individual that constitute the personality (Dennett, 1991; and Damasio, 1999). Consciousness can be divided into "*phenomenal consciousness*" that is itself the experience, and "*access consciousness*", which is the processing of the thing in experience (Block, 2004).

Freire (1980), in his pedagogical method of liberation, is concerned with the consciousness of adult people. For Freire, in his/her adult life, a human being has to learn to think critically, and develop a certain capacity to act consciously on his/her social reality. That is, a person has to understand assumptions and not accept facts as they are, has to develop a sense of what, how and why to interpret and understand his/her current actions based on his/her personal experience of reality (Freire, 1980; and Higgs & Smith, 2002).

...Learning to think critically is one of the most significant activities of an adult's life. When we become critical thinkers, we develop an awareness of the assumptions by which we, and others, think and act. We learn to pay attention to the context in which our actions and ideas are generated. (Higgs & Smith 2002: 130)

Freire develops the concept of conscientization to capture his ideas on critical awareness. The word conscientization comes from the Brazilian word "*conscientização*". It describes a process by which human beings participate

dynamically and critically in transforming their experienced reality to provoke recognition of the world (Freire, 1980). Critical consciousness, therefore, implies analysis to understand rigorously how the world works.

Conscientization, therefore, is a process by which human beings not only achieve awareness, but also understand the socio-cultural reality that shapes their lives and ability to transform that reality (Freire, 1980). It involves awakening people about the obstacles that prevent them from having a clear perception of reality (Freire, 1980). Conscientization exists when people recognise and experience the relationship between objectivity and subjectivity, reality and consciousness, practice and theory (Freire, 1980; and Mc Neil, 1985). As mentioned before, knowing the reality will help the community to develop self-consciousness and to be able to assess itself critically in relation to its environment.

In this process of raising consciousness through social reality, human beings must embrace the real world, as it is (Freire, 1980). For Freire, all human beings are involved in a permanent process of consciousness, although this process varies in space and time in its objective and method. To create self-consciousness is to create environmental awareness and understanding that is considered as the totality of cognition, attitudes and actions. Freire argues that “consciousness of human beings implies consciousness of things, consciousness of the concrete, real world where people see themselves as historical beings” (Freire, 1985: 67-89). When consciousness exists of the social reality, rural

communities will be in a better position to properly value and use the knowledge and practices they acquire through consciousness for in the preservation of the environment.

To awaken critical consciousness, Freire proposes the use of his, judge, act student-centred method (McNeil, 1985). “This method is based on awareness of the necessity of constantly uncovering false appearances designed to protect injustice, an awareness that serves as a foundation for action toward equality and democracy ”(Freire, 1985: 67-89). In other words, human beings have to perceive critically the reality of their world, understand it, judge it and be able to act according to their critical perception. Freire emphasizes the idea that only critical consciousness will lead to an integrated plan and promises of future success in development programmes (Trail, 1995). The present study is therefore, designed to explore how rural communities, particularly their adult members, perceive, understand and react to government EEPs. Figure 1 below illustrates how self-awareness can lead to environmental consciousness for knowledge integration and therefore helps to alleviate poverty.

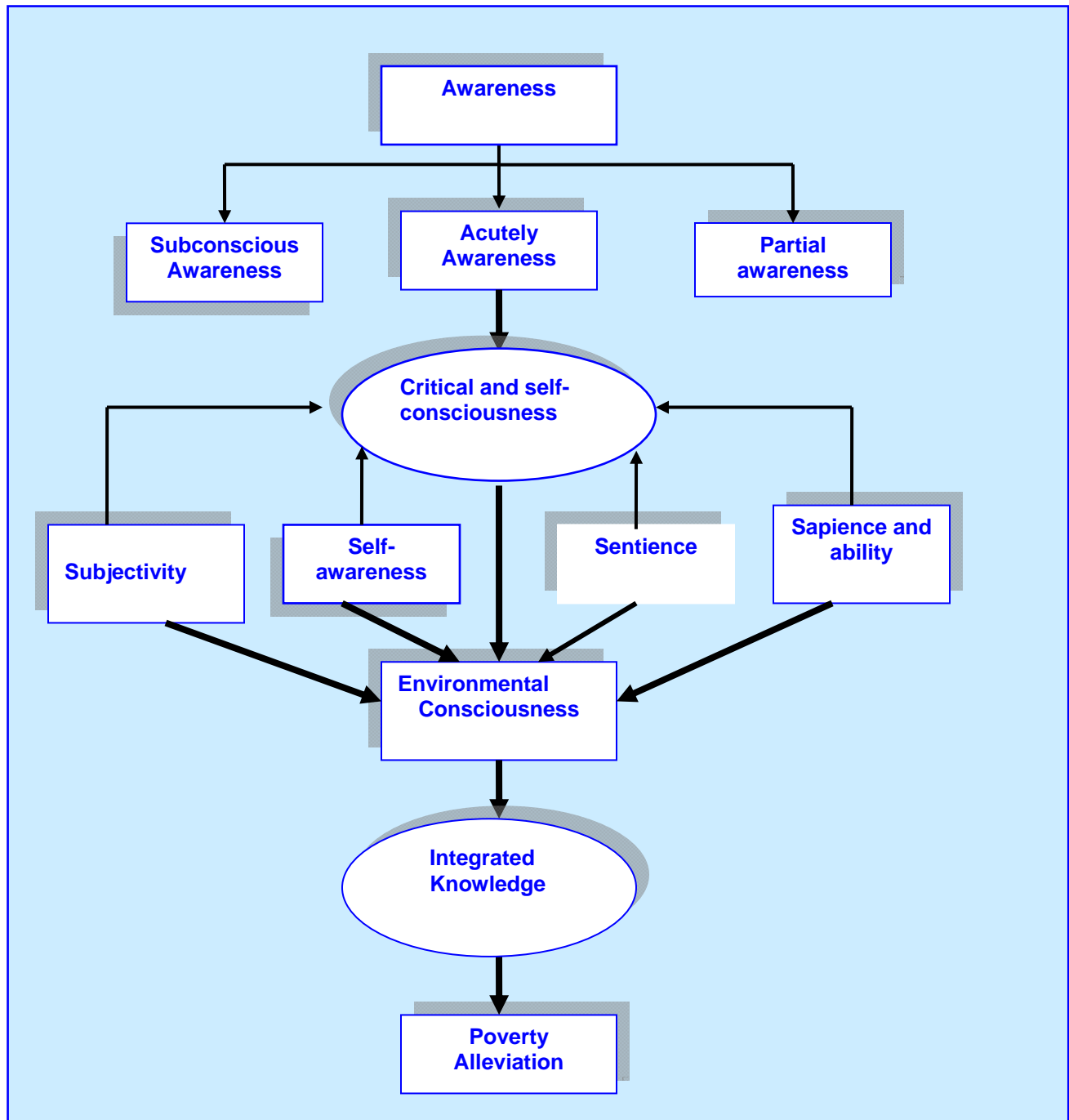


Figure 1: How environmental consciousness can lead to poverty alleviation

Figure sketched by the researcher

## **2.5. Relevance of integrated knowledge on environmental education**

In this section, I discuss the relevance of an awareness of the need to integrate community knowledge systems and practices into environmental conservation and management, leading to sustainable use of the resources for poverty alleviation. Environmental conservation strategies link education to people's attitudes and behaviours, demanding knowledge and skills to make people more capable of solving environmental problems and improving their economic performance (Palmer, 1999: 77-79). Environmental education should, at all levels of society, promote changes in attitudes and behaviours, and help people to develop new skills toward the environment (Palmer, 1999: 141-144).

According to Miller (2003), significant change in society often comes from the bottom up rather than the top down. This means that the process of developing new skills must start by examining local constructions and experiences to the extent that they represent the history and life of people, which is the condition for and of change (Briggs, 2005: 99-114). Trail and James (1995), testing Freire's

methodology for improving the economic status of illiterate rural women, point out that previous development efforts towards changing attitudes so as to develop new skills have failed because they were implemented “top-down” and did not start with the local people. If the development process begins with the knowledge and experience of local people, it will result in the raising of their critical awareness and therefore the development of new skills (Freire, 1970; Chambers, 1995; Trail F T & James C, 1995; & Gough, 2002).

Moreover, Gough (2002) argues that to protect our planet we must “think locally and act globally”. Gough (2002) further highlights that there are several reasons to consider local people and their experiences: if we do not consider local people, we may be ignoring rich sources of environmental knowledge and we devalue local understanding and experience of environmental problems.

Accordingly, indigenous and/or local knowledge is seen as a key strategy for promoting the sustainable use of resources in developing countries, particularly within the poor, rural communities. The actual challenge for environmental education programmes is to redefine the framework for sustainable use of natural resources, linking indigenous and scientific knowledge for benefit sharing and poverty alleviation (Agenda 21, 1992; Kakonge, 1999; Zwahlen, 1996; and Van Noordwijk, Tomich & Verbist, 2002).

However, the main concern within non-governmental organizations (NGOs) and civil society organizations (CSOs) involved in education is still “how to integrate indigenous knowledge with scientific knowledge and how it can be used for sustainability of the natural resources (Rahman, 2000; and Puri & Shay, 2003)

The Earth Summit held in Rio de Janeiro, Brazil, in June 1992, recognized the fact that traditional peoples and their communities have a critical role to play in managing, protecting and developing the environment (Agenda 21, 1992). In Kakonge’s (2000) view the adoption of Agenda 21 during the Rio Summit marked an important turning point for governments and other stakeholders in their joint promotion of sustainable development worldwide. The sustainable development model adopted at the Rio summit is anchored in three principles, namely: economic development, social development and environmental development and protection (Vargas, 2000). It is against this background that this study investigates the extent to which local traditional knowledge and experiences are taken into account when environmental education programmes are implemented.

A recent study of sustainable development and environmental management points to traditional knowledge as a key to reaching sustainable development in the twenty-first century (Vargas, 2000). Vargas argues that the use of indigenous knowledge on environmental management can help to prevent human-induced environmental disasters. In a sustainable development model, traditional knowledge is a critical element that affirms the cultural heritage and ensures the

survival of indigenous people, as it is related to the entire culture, including its identity and the spiritual and religious beliefs of the people (Davis & Ebbe, 1993). As such, this study is important in its “potential” contribution to the understanding of survival of culture, identity and community in Mozambique. It begins from the recognition that across the world, people and communities have developed their own experiences and wisdoms related to the environments where they live. These experiences and wisdoms make up what is called local, indigenous or traditional knowledge. Such indigenous knowledge is often dynamic and non-systematic, and evolves according to the needs of particular societies (Davis & Ebbe, 1993).

However, an integrative review in this area is warranted for several reasons. The lack of knowledge about IKSs and of appropriate models for programmes that actually consider IKS (MICOA, 1996) is the main reason for this study. Studies performed in this area have recognized the importance of indigenous knowledge for sustainable development (Kakonge, 1999; Zwahlen, 1999; and Vargas, 2000), but to date very few studies have tried to explain how indigenous knowledge can be used to sustain the environment for poverty alleviation. This lack of knowledge mainly results from the absence of adequate research and documentation in this area of study. Similarly, very few empirical models combine “scientific” and indigenous knowledge in the EEPCs.



The present study wants to understand how indigenous knowledge affects EEPs in the context of Mozambique, and develop an account of how indigenous or local knowledge may contribute to or hinder efforts to sustain natural resources and the environment. The focus is on the rural community's perception, responsiveness and evaluation of the government's environmental provisions and programmes relating to soil erosion and deforestation.

The environmental education strategy developed by the Southern African Development Community (SADC) in 1999 for its member states emphasizes traditional approaches to natural conservation (Robitaille, Dupré & Lafleur, 2002). The SADC declares that the decentralization of the decision-making process is a crucial element in the implementation of environmental education programmes. It also proclaims that indigenous knowledge is a key source of information in the elaboration of the environmental education strategy (Robitaille, Dupré & Lafleur, 2002). These recommendations involve integrated management of natural resources and more community participation in decision-making processes in particular by the older people, in a community-based conservation strategy. Many old people desire to be recognised as productive members of the society and to continue to contribute to society (Riley & Riley, 1994).

The adoption of community-based conservation strategies requires greater emphasis on education and training, with particular reference to adult education and the understanding of cultures (Pimbert & Pretty, 1997; Merriam & Mohamad 2000; Sheckley, 2000; and Robitaille, Dupré & Lafleur, 2002). This could hold potential for Mozambique and other SADC countries.

However, the practice of community-based conservation remains problematic for two reasons:

- 1 the high dependence of EEPCs on centralized bureaucratic organizations for planning and implementing those programmes (Pimbert & Pretty, 1997);  
and
- 2 The lack of knowledge about the use of rural local knowledge system and its role on environmental education programmes (Merriam & Mohamad, 2000 and Robitaille *et al.*, 2002).

Moreover, Berkes (2004) highlights that it has become increasingly important to incorporate the dynamic interaction between society and natural systems into models, rather than viewing people as “stressors”. However, the limited number of models and examples on community-based conservation strategies based on indigenous knowledge contributes to the non-applicability of these strategies (Pimbert & Pretty, 1997; and Berkes, 2004). It is in this context that the present study explores the nature of and rationale behind the environmental education programmes in Mozambique.

Rahman (2000) in his study on “ a participatory DSS to incorporate local knowledge for resources and environmental management in developing countries” shows that resource management issues involve complex and differential perceptions which challenge science to develop understanding of local indigenous knowledge and learning environments that will better inform and support sustainable decision-making. Accordingly, sustainable development will be fruitfully achieved if the science base is developed according to the priorities of the local people, and a technological base created that includes both traditional and scientific knowledge to solve environmental problems (Rahman, 2000).

Kazemi, Shahvali and Zarafshani (2003), developing a new model for improving soil conservation decision-making processes, realized that indigenous soil conservation knowledge and practice among farmers falls under four indigenous sub-systems: the indigenous elite, social institutions, indigenous knowledge and practices and decision-making process. Accordingly, a new model for soil conservation must consider traditional farmers as the potential solution rather than the problem, and put the importance of local knowledge and practices at the core of new programmes (Kazemi *et al.*, 2003). This means that soil conservation programmes must value the culture and knowledge existing within traditional farmers and local people in order to achieve sustainable development.

Likewise, Vargas (2000) explores the role of educational institutions in fostering sustainable development and highlights how essential it is, to understand why culture plays an important role in sustainable development, and the necessity of identifying the forces that challenge sustainability. In Vargas' view, necessary steps include reconciling free-market policies and community-centred norms and practices; integrating traditional knowledge and technology; respecting and understanding cultural heritage while acknowledging human rights; educating to link environmental justice to an ethical imperative; and bridging international values with local values and cultures. In support of Vargas, Kazemi *et al.* (2003), who conducted an in-depth analysis of conservation of resources by farmers, find that concentrating on technology alone to conserve resources has little success. Technology alone encourages farmers to allow or engage in conservation measures that they neither agree with, nor feel any responsibility to maintain (Kazemi *et al.*, 2003).

Thomas (2003) argues that conservation policies will be more productive when indigenous activities are viewed as a disturbance and not as a vehicle for establishing equilibrium with the environment. Thomas (2003) highlights that sustainable development projects that were supposed to ensure the future of earth's biological inheritance are currently criticised for compromising biodiversity. Early reports on the capability of indigenous cultures to conserve their homelands are not encouraging because the relationship between indigenous people and the resources that have been exploited are still very little known by scientists (Thomas, 2003). Therefore, policy makers cannot rely only on indigenous cultures and knowledge for sustainability.

The key question is not indigenous versus scientific knowledge but rather a matter of looking for the right way to protect the endangered biodiversity. It is also a matter of diversity (Zwahlen, 1996; and Tomas, 2003). However, the relevance of indigenous cultures and knowledge with regard to environmental degradation as a phenomenon of modern times, even if sometimes the use of some indigenous practices becomes no longer applicable, should not be ignored.

Karjala, Sherry and Dewhurst (2004) address the need for criteria and indicators of sustainable forest management in the John Prince Research Forest (JPRF) by developing a framework for integrating indigenous values and management approaches with forest management science. They find that the Aboriginal Forest Planning Process (AFPP) is a good approach for incorporating Traditional Environmental Knowledge (TEK) into forest management planning. The study is a starting point from which rural communities can engage their own members in participatory analytical decision-making about local controlled forests and constructively collaborate with outside managers in developing commercial forests on traditional lands (Karjala Sherry and Dewhurst, 2004). The study suggests that scientific and Indigenous Systems of Knowledge can be complementary, and can in combination provide a superior approach to natural resource management (Karjala Sherry and Dewhurst 2004). Moreover, incorporating TEK into natural resource management can provide alternative ecological interpretations and help bridge the gaps in our scientific knowledge of ecosystems (Karjala *et al.*, 2004). In this view, it becomes clear that a new environmentally sustainable model requires using a combination of Indigenous

and Western approaches, and finding a common framework to overcome cultural barriers that impede constructive relationships between both knowledge systems, in order to lead to sustainable use of resources for poverty alleviation.

According to Vargas (2000), the integration of traditional knowledge with modern technology also of course ensures that a greater body of knowledge (integrated knowledge) is available to address the complex challenges involved in sustainable development. However, building integrated knowledge requires that Indigenous and Western Knowledge accept cognitive transformation, as shown in Figure 2 (Rahman, 2000; and Woodley, 2002). Despite their epistemological and ontological differences, the two systems of knowledge need to converge in a shared function, such as sustainable use of resources (Rahman, 2000; and Woodley, 2002). It is the integrated knowledge that will generate the new technology needed for sustainable use of resources.

Rahman (2000), in his framework for integrated knowledge, demonstrates that the resulting technology should be able to generate an adaptive participatory and interactive decision-making process, and establish equitable relations between Indigenous Knowledge and scientific knowledge systems through an ongoing process of dialogue and partnership-building among the local communities, scientists, managers and policy-makers (Rahman, 2000). The new technology will also allow cognitive transformation of both the indigenous and scientific knowledge held by the stakeholders (local communities, scientists, managers and policy makers) (Rahman, 1996; 2000).

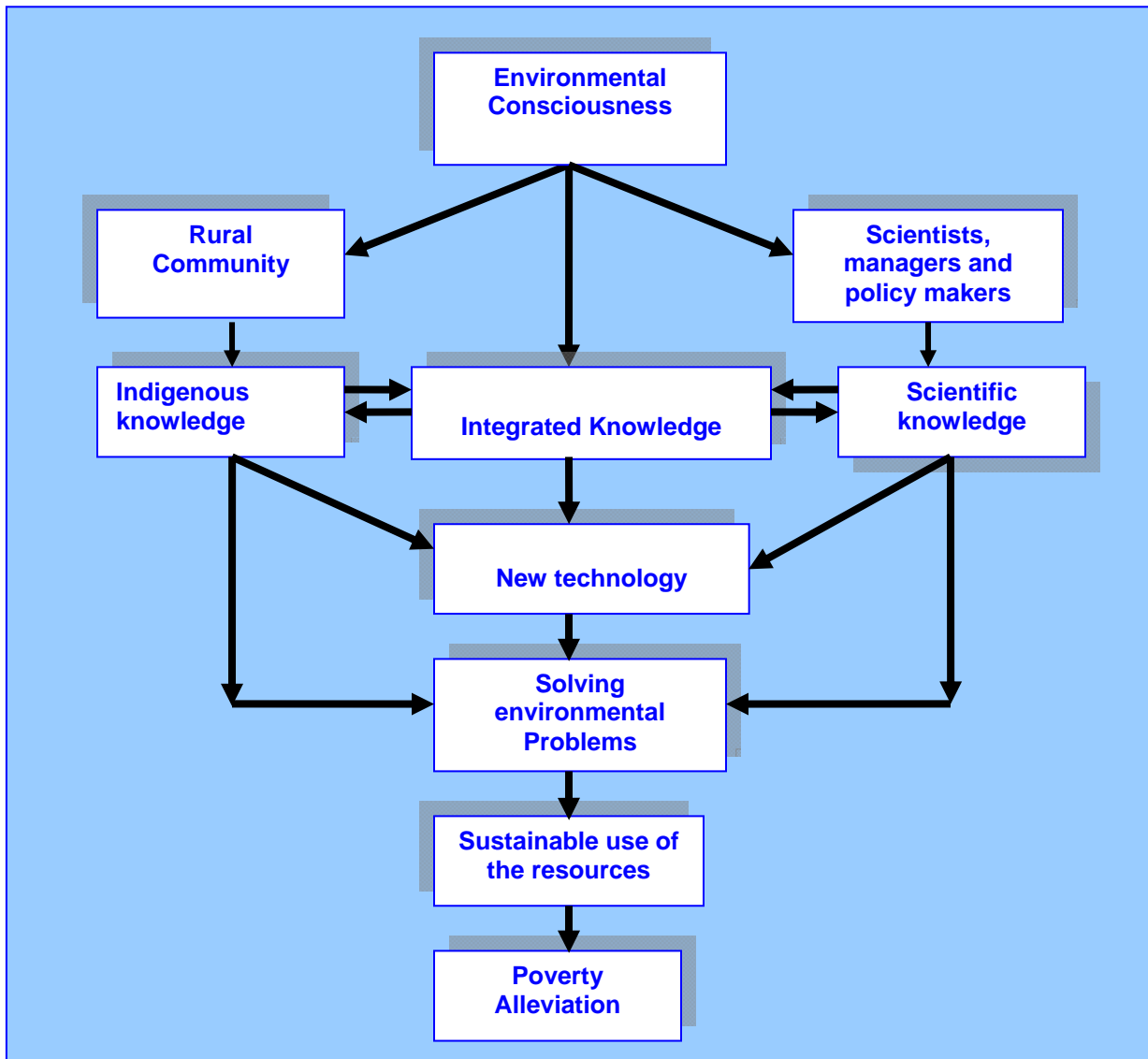


Figure 2: Framework for integrated knowledge on environmental education programmes

Figure sketched by the researcher

In the framework shown in Figure 2, above, the influence of the cognitive process of consciousness on rural communities and scientists, managers and policy-makers allows the convergence of two interdependent components, namely Indigenous Knowledge Systems and Scientific Knowledge Systems, through dialogue and partnership to build integrated knowledge.

The model demonstrates that environmental consciousness is needed not only among poor rural communities, but also among business community, scientists, managers and policy-makers. These are different groups with different knowledge systems. Once environmental consciousness is raised among these groups, the two systems of knowledge can easily be integrated and new strategies and technologies developed to solve environmental problems.

According to the New Partnership for Africa's Development (NEPAD, 2002), addressing environmental issues is a necessary condition for achieving the goals of sustainable development and the eradication of poverty. However, "the state of the environment is a major determinant of the growth and development of any country. It has a pervasive effect on the safety and standard of living of the population" (NEPAD, 2002: 52-53). Against this background, this study also explored the current use of integrated knowledge, if at all, in solving environmental problems and alleviating poverty in the Mozambican situation.

Poverty alleviation is a national priority, and must be at the forefront of all initiatives in the country. However, environmental education is actually challenged to respond to new intellectual and moral dimensions of education as they apply to people and the environment. Environmental education has the difficult task of recognizing and clarifying concepts in order to develop the skills and attitudes necessary to understand and appreciate the inter-relatedness of man with his culture and his biophysical surrounding (Barraza, Duque-Aristizábal & Rebolledo, 2003).



In summary, the theoretical framework of this study is designed around the three critical themes discussed above. In the first section of this review, the importance of education in enhancing environmental programmes, as discussed by researchers including Fisman (2005); Palmer (1998 and 1999) and Chamber (1995), was discussed. Secondly, the importance of the participation of rural communities and of adults was noted and critical consciousness defined as elaborated in the work of Freire (1970; 1980; and 1985), Higgs and Smith (2002) and Clover (2003). In the last section, a new model for integrating indigenous knowledge into scientific knowledge for sustainable use of resources, as discussed by Rahman (1996; and 2000), Vargas (2000), Woodley (2000) and Karjala *et al.*, (2004), among others, was discussed. Using these major themes as the central components of this framework, I investigated the nature of and rationale behind the two selected EEPCs in Mozambique. In other words, this study sought to understand whether or not the government's programmes are designed to address environmental issues through adult learning, maximum community participation and the fostering of positive awareness of the environment.

## **CHAPTER THREE**

### **3. METHODOLOGY**

#### **3.1 Introduction**

This chapter describes the research design, approach and data collections techniques used in this study. The selection of subjects, the procedures for data analysis, issues of validity and reliability and the limitations and ethical concerns are also discussed. The study focuses on the rural community's perceptions of, responses to and evaluation of governmental environmental provisions and programmes related to soil erosion and deforestation.

#### **3.2 Research design**

Qualitative research methods were used to investigate the Makua rural community's perspectives, feelings, thoughts, beliefs, ideas and actions about EEPs in the natural situation. These qualitative methods provided verbal descriptive and analytical tools to disclose the richness of events that arise in the natural settings of Makua rural communities (Macmillan & Schumacher, 2001:

41). Furthermore, qualitative research methods were highly suited for this study because:

(i) they are descriptive in nature and concerned with processes rather than simply with outcomes and products and,

(ii) they tend to analyse data inductively and have the advantage of using the natural setting as the direct source of data, with the researcher as the key instrument (Merriam, 1988: 208; Cohen, Manion & Marrison, 2000; and Patton, 2002).

A qualitative approach, therefore, has the potential to supplement and reorient our current understanding of the complexity involved in developing sustainable programmes for environmental education.

### **3.3 Research approach**

A case study approach was used in this study. This method was chosen because in this study, a holistic in-depth investigation was needed on the one hand, while on the other the matter under investigation is an action. The study sought to examine the local people's perceptions of and reactions towards the environmental education programmes happening in the Makua rural community, which provides a unique example of real people in real situations.

According to Cohen, Manion and Marrison (2000: 182-183), a case study strives to describe a particular situation, to catch the close-up reality and provide thick description of participants' life experiences, thoughts and feelings about a situation. This means that a case study tries to provide a real image of the situation in the real context. A case study offers a means of complex social investigation, enabling a better understanding of a phenomenon based on the real life of a community. In this instance, I studied the phenomenon of environmental education programmes in the life of the Makua rural community. In studying this phenomenon of environmental programmes, I sought to bring out the details from the viewpoint of the Makua rural community about the EEPs related to soil erosion and deforestation.

The study is a sociological case study that investigated the role of the Makua rural community's knowledge in EEPs. This sociological study is devoted to examining educational phenomena, namely the environmental education programmes in the Makua society. This kind of case study strives to understand how the Makua rural community makes sense of important events in their lives. According to Hamel & Fortin (1993) and Hamel (1993), a case study, as a sociological approach, attempts to highlight the features or attributes of social life in a community. The focus of this study, therefore, is the social life of the Makua rural community, the roles people play in it and the nature of the Makua community in general. In studying this community sociologically, the study specifically aimed to uncover how the rural community understands, takes into account and acts in response to environmental education programmes.

This, therefore, allows evaluation of the extent to which local knowledge is incorporated into environmental education programmes.

### **3.4 Description of the field and selection of the research sample**

#### **3.4.1 Characteristics of area of study**

The study was conducted in four districts, namely, Nacala-Porto, Mossuril, Mogovolas and Mecuburi, of the Nampula Province in northern Mozambique (see figure 3.1). Nampula was chosen as an appropriate area for this study because of its uniqueness in the country, in three main respects: First, Nampula is the most populated province of Mozambique with almost 25% of the country's population, estimated to be about 19.4 million inhabitants (UNDP, 2004). Second, Nampula Province has benefited from environmental education programmes since 1992 because of its environmental problems, with particular reference to soil erosion and deforestation (MICOA, 2001). Third, it is known as a province with a well-established tradition of indigenous knowledge and practices (MICOA, 2001).

Nampula Province is affected by only limited influences from outside cultures, due to its geographical location, bounded to the north by the Lurio River towards the Cabo Delgado Province, the Ligonha River in the south towards Zambezia Province and the Indian Ocean to the east (UNDP, 2005), (See Figure 3.1 & figure 3.2 below). Nampula has an area of 81,606 km<sup>2</sup> and a population of approximately 3.4 million according to the census of 2002 (WWF, 2004).

According to Katupa (1985), Nampula Province is home to a single ethnic and linguist group, the Emakua, consisting of approximately three million people. It also has the third largest city in Mozambique, its capital city, also named Nampula, which first came to being as a military post and increased in importance as an administrative centre for northern Mozambique.

The main characteristics of Nampula include the Makua traditions, the *miombo* forests and the many granite rocks all over the province. Agriculture is the dominant economic activity in the province, with about 87% of the workforce classified as small farms compared to 76% for the nation. Illiteracy rates are considerably higher than in the rest of Mozambique (UNESCO, 1997). Before the war, the province of Nampula served as an important trans-shipment area, with railway lines running from the port of Nacala (the deepest in Africa) to the Malawi border. Currently, many governmental and non-governmental organizations are paying attention to the need for farmers in developing a market-oriented environment in a participatory and sustainable manner.



Figure 3.1: Mozambique and its provinces





MICOA (appendix A); and confirming that I am student at the University of Pretoria (appendix B). In addition, I also discussed the proposed area chosen for this study and the reasons for choosing it. From the National Directorate I proceeded to the Department of Environmental Education, where I explained the aims of the study to two officials in charge of EEPs and requested their consent to participate in interviews. This being granted, we set the date for the interviews, a date after my scheduled data collection at provincial and district level. I also received a letter of consent (appendix C) and a credential (appendix D) from the National Department to present at the Provincial Directorate of the MICOA

The proposed area of the study was originally to include only two districts, namely Nacala-Porto and Mogovolas. These two districts are the most critical districts in the province, in terms of environmental problems related to soil erosion and deforestation, and have benefited from the EEPs. However, in the field, when I visited the Provincial Directorate of the MICOA and explained the aims of the study, the staff there persuaded me to include more two districts, namely Mossuril and Mecuburi. According to the Provincial Directorate of the MICOA, including these two districts would make the study stronger in terms of comparison and evaluation of effectiveness, acceptability and impact of EEPs. The Nacala-Porto programme is well-resourced, having been founded by an NGO and equipped with posters, booklets, manuals, videos and cassettes, nursery equipment and other materials. The Mogovolas programme is less well-resourced, having been founded by the government with limited funds; it had only some materials, such as manuals and booklets.

The Provincial Directorate of the MICOA suggested that the two other areas would provide an opportunity of comparing consistency of implementation of EEPs under government and non-governmental control. The Mecuburi district was included because it presented an exceptional community, engaged in environmental protection without benefiting from environmental education programmes.

The Provincial Directorate of the MICOA was very hospitable and provided a staff member to accompany me in the first two districts, Nacala-Porto and Mossuril. I was also given permission letters (appendix E), which explained the Provincial Department's awareness of and consent for the study to be conducted in the districts. The letters were submitted to each district secretariat as a way of seeking permission from the district's government. A staff member was to assist with and facilitate contact with local authorities, as he was known as a provincial staff member of the MICOA in the area. In addition, the Provincial Directorate provided the financial support necessary for the transport, accommodation and food for this assistant staff member.

Travelling to the districts, except to Nacala-Porto, was completely dreadful because of the poor transport facilities. My departure time from the province centre was always 4.30 am, because after this time no more vehicles are available. The public transport takes the form of old pickups, which leave the city completely full and break down two to three times on the way.

After the first two visits, another staff member was provided by the Provincial Department to assist me in visiting the last two districts Mogovolas and Mecuburi.

The Provincial Department of the MICOA has only two staff members. One is the Head of Department who is in charge of implementing the environmental education programmes. The other plays a supporting role and does not participate in the implementation process. For this reason, only one official at the Provincial Department was able to participate in this study. In Nacala-Porto district, the Department of Environmental Education has three staff members, only two of whom were able to participate in the interviews.

In order to determine the targeted groups in each district, the aims and the importance of this study were explained to the Administrator of the districts and permission requested to visit and collect data in the communities. Additionally, a copy of the field activities was also given to each administrator. Fortunately, all the district departments were very receptive and welcoming, kindly providing transport and staff assistance directly or indirectly linked to the EEPCs, and to the communities that have been benefiting or had benefited from EEPCs.

When I reached the communities' dwelling place, the staff member of the district government department introduced me to the community leaders and each family of participants, and briefed them about the aims and importance of this study.

Then, each community's leader was made to understand that the sampling for each district comprised only adult people from five families that participated in EEPs. Having consented, the community's leader or his representative conducted the staff member and myself on a visit to the five families, previously identified by the community's leader. This is possible because the community's leader knows and has control over all its members.

This outline applies to the first three districts, Mossuril, Mogovolas and Mecuburi. In the Nacala-Porto district, the procedures were quite different because the district has both municipality and district government offices. At the municipality office, where the Department of Environmental Education is located, the aims and relevance of this study was explained to the department officials and to the municipality president, who is the highest official in the municipality. However, I had to make an appointment through the secretariat before I could meet the president. At his office, I carefully explained the aims and importance of the study, and gave him a copy of a summary of the field activities containing the topic of the study, aims, importance of the study and field activities program. I also requested assistance from him in terms of transport to the communities. The municipality president offered some questions and comments and described in detail how and where the municipality has implemented EEPs. He stressed the importance of conducting visits to all three communities, and provided me with transport and one official who assisted me in the fieldwork in the communities.

### **3.4.3 Selecting the sample**

Purposeful sampling and criterion-based selection were used for the study. Only communities and families who had participated previously in environmental education programmes were interviewed. This approach allowed this study to discover and understand how environmental education programmes were implemented in Nampula rural communities. According to Macmillan and Schumacher (2001) samples are chosen because they are likely to be knowledgeable and informative about the phenomena that is being studied.

To select the participants in each family, maximum variation sampling was used in an effort to include men and women from the Makua rural community. This approach allowed the study to get a variety of points of view and much information about the community's perceptions on EEPCs implemented by the MICOA (Macmillan & Schumacher, 2001). Only adults were interviewed in each family, because they are the main targeted group and constitute the majority of participants in environmental education programmes in the rural community, according to the Provincial Directorate of the MICOA. According to NIACE (1993), the majority of citizens and parents are adults who are in constant relationship with the environment but do not have opportunities to attend formal education programmes. Therefore, they should be the primarily focus of environmental education programmes.

The sample size differed according to the target group. The proposed model of purposeful sampling was to find ten (10) families from the community target group, thus five (5) families from each of the two districts originally selected. From the MICOA target group, the samples were to be ten (10) people, including three (3) from the National Department of Environmental Management (DNGA) in Maputo; two (2) from the Provincial Department of Environmental Management (DPGA) in Nampula Province; and of four (4) (2 in each district) from the Departments of Environmental Education (DDGA) of the two districts.

However, the inclusion of two additional districts increased the sample size of the community target group to twenty (20) families (5 families from each district). Of the four districts that I visited, only one district, Nacala-Porto, has a Department of Environmental Protection with a MICOA representative. Therefore, the size of the MICOA target group decreased from the proposed ten (10) people to five (5), two (2) from the national department, one (1) from the provincial department and two (2) from Nacala-Porto<sup>3</sup>. After collecting data at provincial and district levels, I then conducted interviews with the national officials of the MICOA.

### **3.5 Data collection process**

#### **3.5.1 Data collection techniques**

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<sup>3</sup> Nacala-Porto is the world's second deepest natural harbour, and the deepest in Africa. It has been developed for shipping since 1951 and is now an important port with rail links to neighbouring countries.

See [web@mozambique-travel-service.com](mailto:web@mozambique-travel-service.com).

The data for this study were collected using the multi-strategy technique shown in Figure 4 that involved observation, unstructured in-depth interviews, document analysis, digital camera and tape recorder. Using this multiple strategy allowed me to corroborate the data obtained from each of the various different methods. The main technique of data collection in this study was unstructured in-depth interview and the other techniques were used to confirm its findings. Macmillan and Schumacher (2001), highlight that a multi-strategy technique increases the credibility of a study.

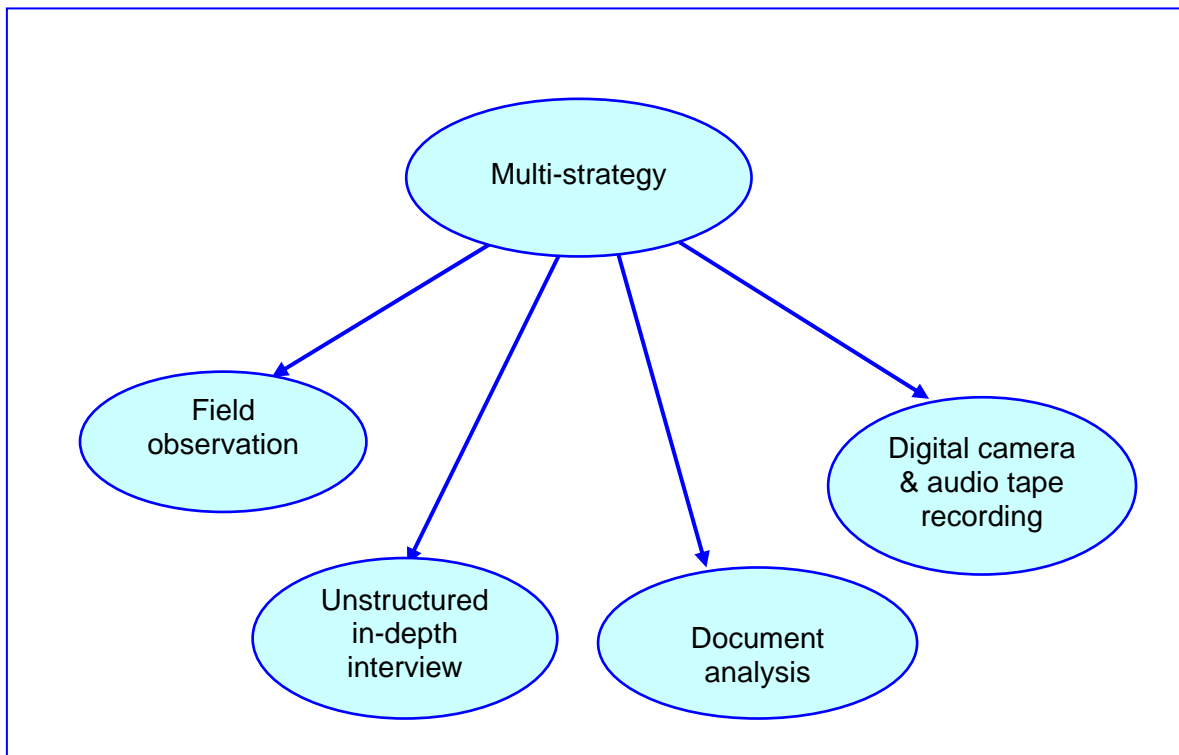


Figure 4: Data collection techniques

For the MICOA target group, data were collected through unstructured in-depth interviews and documents analysis. Unstructured in-depth interviews, observations, digital camera and audio tape recording were used to collect data from the Makua rural community target group. However, the interview questions were different according to the target group. Table 2 below presents the data collection techniques used to obtain data for each research question in the respective target groups.

Table 2: Data collection techniques for each research question and respective target group

<b>Research question</b>	<b>Data collection method</b>
1. What is the nature of and rationale behind the EEPs (deforestation and soil erosion) undertaken by the MICOA in Mozambique?	Document analysis and interviews (MICOA)
2. In what ways and to what extent do the programmes and campaigns incorporate local indigenous knowledge systems and practices?	Interviews (MICOA and community)
3. How do the local communities respond to the EEPs and how can their responses be explained?	Observation (community), interviews (MICOA & community) and Document analysis (MICOA)



### **3.5.1.1 Field observation**

Field observation is the technique of directly observing and recording without interacting with the participants. In this study, unstructured observations are used in a natural way, seeking to get into close contact with the Makua rural communities in order to understand how they interact and make their lives meaningful (Silverman, 2005 and Punch, 2005). This approach involves a direct, eyewitness account of social actions and settings, taking the form of field notes. “Field observation is an integral part of in-depth interviews in which facial expressions and body language are recorded in the form of notes” (Macmillan, & Schumacher 2001; 41& 454). Deconstructing observations allows the study to gain insight into social settings and understand why rural communities react in the way they do, and is useful in examining the community’s behaviour and revealing aspects of their life.

### **3.5.1.2 Unstructured interview**

An unstructured interview is an interview technique that employs a non- directive style that permits the interviewees to express their experiences and interests with minimum direction. An unstructured in-depth interview is an open-ended in-depth interview designed to obtain rich and detailed data from a participant using follow-up questions in the form of conversation. Considering the nature of the study, which focuses on the participants’ social life, unstructured in-depth interviews were the most suitable research technique to produce rich and

powerful data. According to Smith (2001) and Bryman (2004: 319-321), “unstructured in-depth interviews are appropriate for research into feelings, attitudes, intentions and motivations of behaviour”. This approach enabled me to get the participants’ points of view about EEPs and understand the complex behaviour of Makua rural communities.

#### **3.5.1.3 Document analysis**

Documents are records of past events or plans that are written or printed. Documents provide background information on the topic (Macmillan & Schumacher, 2001) and they are rich and important sources of data for social research (Punch, 2005). In this study, official and institutional documents in the form of files, programme descriptions and strategic plans were collected and analysed. Documents were important in the triangulation of data from interviews and observation. Document analysis made it easy to understand the underlying principles of the environmental education programmes in Mozambique.

#### **3.5.1.4 Supplementary techniques**

Supplementary techniques are additional techniques employed in qualitative research to help make the findings credible (Macmillan & Schumacher, 2001: 43, 450) and validate the data. In this study, a digital camera and a tape recorder were used as supplementary techniques of data collection. This approach helps in interpreting, elaborating or confirming the data collected through the in-depth

interviews, observations and document analysis. With the digital camera, some important photographs (appendix F) about traditional techniques used by communities to preserve the environment and the results of activities on environmental education programmes were taken. Some of these pictures, for example picture 5, reflect the community's attitude towards EEPCs. The kind of image that could be useful for this study was planned. This supplementary technique allowed deeper understanding of how and why Makua rural communities perceive and react to the environmental education programmes, through the collecting of images that illustrate the interaction between the community and the EEPCs. The tape recorder was used to record the interviews as they proceeded, to ensure that the complete dialogue with the participants was recorded and to provide material for validity and reliability checks (Macmillan & Schumacher, 2001).

### **3.5.2 Observation**

The proposed plan of fieldwork was to spend one week in each district doing field observations, familiarizing myself with the communities and taking field notes while the process of interviewing was going on. However, in the field, after meeting the provincial and first district governmental departments and discussing the project with them, answering all their questions and taking into account their counsels, I realized that the fieldwork depended on me being accepted by the participants at all levels. This was of course particularly important on the community level. Thus, my first fieldwork plan was not feasible, for three major reasons. Firstly, the area of study increased from two to four districts, and consequently, the number of communities and sample size also increased.

Secondly, the new plan was to visit at least three communities that were involved in environmental education programmes in each district. I did not originally plan to visit all the communities that had benefited from EEPs.

However, dialogue with the district government departments made clearer to me the extent of environmental education activities have been carried out and in which communities, and which communities I should visit in each district. The procedures to get permission and consent then took two days, because it included making appointments, meeting the district government and local political structures, getting permission and consent to collect the data and finally meeting the community members. This last step was more complicated because the community members usually go to their farms on weekdays, making previously made appointments necessary. According to the community leaders, they needed time to mobilize the families to participate, since it depends on the individual family if they are willing to participate or not. This necessitated a familiarization strategy, so that families would be encouraged to participate in the process.

In the end, I visited the four districts and then selected the communities to visit with the assistance of the districts government. In each district, I visited three communities that have benefited from EEPs. For instance, in the Nacala-Porto district I visited two communities that have benefited from a project of environmental education programmes called “*Integrated Development Project of Nacala*” that run environmental activities related to reforestation and soil erosion.

I also visited one community that is still benefiting from the “*Biodiversity Marine and Coastal Project*”, which carries out environmental activities that attempt to protect the marine and coastal ecosystems in the district.

I had to familiarise myself with the participants and operational structures of the programmes, in order to identify the resources in use and to generate themes and ideas that could be explored later in the research process. As part of this familiarization process, to facilitate communication and acceptance within the community, I also put on traditional attire. The communities were welcoming in all districts, some families offering food or fruits like mangos and guavas. In Mussuril district, I visited and interviewed a particularly lively family.

I spent an average of three days in each district. Walking around in the community and asking permission and consent from the district government departments, local community structures and communities members was interesting. I observed the results of the implementation process of the EEPs, and visited and observed the reforested areas (appendix G), and photographed various areas that have been recovered from soil erosion problems (pictures 1 & 3). I observed the community’s socio-economic situation and the community’s life in general (appendix H),. In addition, I photographed a traditional technique used by the communities to protect their houses from soil erosion problems (pictures 4 & 5; appendix I), and the result of the community’s reactions to the EEPs (picture 2). Overall, therefore, in the process of observation I compiled comprehensive field notes at the end of each day, with photographs taken with permission from the communities, to facilitate my study of the operations of the

MICOA's environmental education programmes. However, it was not possible to observe personally an ongoing environmental education programme. After approximately two weeks of intensive observations, I took a one-week break and then went back to the field, spending two days in each district.

### **3.5.3 Conducting interviews**

Non-structured in-depth interviews were the main technique used for data collection. The interview was designed to explore the nature and rationale of EEPs, and examine how rural communities understand and react to these programmes. A few general open-ended questions were used which allowed me substantial latitude, partly to enable the respondents to build confidence, trust and security. In addition, I designed the common interview framework (appendix J-1) and J-2) to cover the various aspects of community perspectives related to EEPs.

The interviews process was very easy because the community leaders selected the interviewees and informed them about the study. The interviews were house-to-house, face-to-face and in-depth, and thorough enough to explore the experiences and perspectives of the Makua rural communities. Each family was briefed about the objective and benefits of the study to avoid any misunderstanding. For the majority of the community target group, the interviews were conducted in their local Emakua language, to ensure that the participants were at ease and stimulate co-operation. However, in Nacala district some few

interviewees from the rural community target group chose to be interviewed in the Portuguese language because they felt more comfortable speaking in this language. Portuguese is an official language in Mozambique, but the majority of the Mozambican population particularly in Nampula communities speak Emakua.

The interviews tended to be more like conversations than formal interviews and took place in the family's houses. The interviews were meant to include all adults (men and women) in the family. However, because of cultural issues in some families women were embarrassed and did not participate, rather affirming that they had nothing to say because their husbands had said everything. Interestingly, in other families, the husbands were absent and women were free to talk and interact. These different behaviours by Makua women both reveal respect for their husbands. In African culture, in particular in Mozambican culture, the man is the head of the family and decides what the women have to do. Therefore, when their husbands are around women are always constrained in giving their opinions. For this reason, the majority of participants of rural community target group were men. Participants who were able to write were required to sign informed consent forms before the interviews started.

For the MICOA target group, non-structured in-depth face-to-face interviews were conducted. All the interviews for MICOA officials were conducted in Portuguese in their offices and all the participants were required to sign informed consent forms before the interviews. These interviews were also in the form of conversations.

The themes of the interview questions for this study revolved around the experiences, perceptions, responses and perspectives of Makua communities about EEPs. The interviews lasted approximately one hour to one and a half hours on average. The interviews were recorded and later transcribed. Using the digital camera and tape recorder helped to guarantee that all data was captured adequately and to minimize loss of information. To ensure that the digital camera and tape recorder did not disturb the respondents, I previously explained to the communities the necessity of using these supplementary techniques.

Twenty interviews were conducted in the rural communities target group and five in the MICOA target group. After collecting data from the districts, I briefed the provincial directorate about the fieldwork, and then interviewed the MICOA officials. Finally, I interviewed two officials at the National Department of Environmental Education in Maputo. These interviews were conducted in the afternoon between 4:00 and 6:00 pm in the officials' offices, on two different days. Overall, therefore, I spent a total of 30 days in the first half of 2006 conducting interviews and making observations.

#### **3.5.4 Analysing documentary data**

I carefully reviewed the relevant documents, including programmes, project plans, environmental policies, environmental education manuals and district files, and took notes. When analysing these documents, I attempted to discover the origin, characteristics, underlying principles, and objectives of EEPs in Mozambique, and to analyse the socio-economic situation of the major targeted



groups. This helped me to interpret the communities' behaviour towards EEPCs. Documentary data allowed me greater understanding of the extent to which local knowledge is incorporated into EEPCs.

In this process of documentary analysis, I carefully examined the manuals and strategic plans of the MICOA's EEPCs in terms of questions like:

- Whose voice is in the manuals?
- To whom are the manuals addressed?
- Who will actually use the manuals?
- For what purposes?
- What is included and what is omitted?

Analysis of these questions helped me to address the aims of this study and understand how the MICOA goes about implementing its EEPCs.

### **3.6 Procedure for data analysis**

In this section, the techniques used in presenting and analysing the data are discussed. The collected data were analysed using a qualitative approach. Qualitative analysis is an inductive process of organising data into categories and identifying patterns among these categories (Le Compte, 2000: 147-153; Macmillan & Schumacher, 2001: 460-480; and Punch, 2005: 194-212). Qualitative analysis is an ongoing process that involves continual reflection about the data, coding the material into categories and finally interpreting the data for understanding, which can be applied in a theory or policymaking.

In this regard, a preliminary data analysis was done while the data were still being collected. This helped me refocus questions and attention towards central themes.

Content and case analyses were an appropriate approach to use to analyse the data collected from the target groups using multi-strategy techniques. In this process, all written data from observational field notes and open-ended interviews notes were reviewed. Then, all tape-recorded data were fully transcribed. All the written data was then translated to English. This transcription and translation process was time-consuming, taking almost three months. An average of six hours was spent transcribing and 12 hours translating each interview. However, this yielded significant data for the study.

The processes of coding and clustering were used to organize the translated data (Appendix L). In the coding process, the data from open-ended question and additional respondent information are located to specific categories for the purpose of analysis. The categories, which reflect the research questions, include the underlying principles of EEPs in Mozambique, the integration of local knowledge into these programmes, the local communities' perceptions and reactions to the programmes and the local community's knowledge about and practices in environmental protection and conservation. Then units of meaning are generated, classifying, categorizing, ordering and structuring narratives to interpret and describe the contents of the collected data.

In the clustering process, items or units are sorted into categories according to their types and classifications (Cohen *et al.*, 2000). To complete the analysis, categories of themes are compared in order to identify similarities and differences between them. This is mainly to identify and integrate themes into a framework offering an accurate and detailed interpretation of key issues relating to EEPs in Mozambique.

### **3.7 Validity and reliability**

Methodological triangulation, peer review, selecting a typical case, and member check were used to enhance validity and make the data reliable. Triangulation is the use of multi-strategies methods in the study of some aspects of human behaviour (Cohen *et al.*, 2000; Macmillan & Schumacher, 2001). In this study, unstructured in-depth interviews, observations, documentary data and supplementary techniques were used to triangulate the data. Field observations of the setting in which the interviews occurred provided confirmation of the data. After I transcribed all the data, I revisited the two staff members of the National Department of Environmental Education to reconfirm the data with them.

In addition, I also did member checks by telephone with the provincial officials and directorate. Furthermore, mechanically recorded, tape-recorded and digital camera data were used for confirmation, by comparing the data collected from

interviews with recorded data and photographs.

The strategy of participant observation, which consisted of combining in-depth interviews with field observation and document analysis as a means of corroborating evidence, was also used to validate and make the data reliable. Face-to-face and house-to-house interviews were used to get close to the participants for corroboration of the data, thus increasing validity.

### **3.8 Limitations and ethical issues**

#### **3.8.1 Limitations**

The major limitation of this study was language. The data were collected in two different languages, as discussed above, the interviews with the MICOA target group in Portuguese and with the community target group in Emakua. To solve this problem, some of interviews recorded with the communities were translated immediately from Emakua into Portuguese. In Maputo, some colleagues from the Pedagogical University offered to assist me in translating the rest of data from Emakua into Portuguese. Finally, the translation from Portuguese to English was done. Moreover, after the translation has been completed, the transcribed English and Portuguese data were given to some colleagues from Pretoria University who speak Portuguese, as a form of peer review. This was an attempt to minimize the skewing effect of the language differences.

Culture was another limitation. During the interviews in the community target group, rural women were not free to participate, saying that their husbands knew more about EEPs. As a result, very few women participated in the study. This barrier did not allow me to get a variety of points of view about EEPs in terms of gender.

### **3.8.2 Ethical principles**

The study of local Indigenous Knowledge and EEPs is very complex and delicate, since it concerns the private life of the participants. For this reason, it was important to consider ethical issues. In this respect, I visited the district government and the chiefs of the communities in each district and briefed them on the objectives and imminent benefits of this study. Before the interviews were carried out, consent was sought from community chiefs and participants. I explained that participation in the research project was voluntary and confidential. I also explained that they would not be asked to reveal any information that would expose their identities, unless they were willing to be contacted for individual follow up interviews. House-to-house and face-to-face interviews were carried out, and the interviewees were again briefed about the objectives of and reasons for the study. To avoid misunderstandings, particular attention was given to the community target group, which consisted mostly of older people.

To ensure confidentiality and the anonymity of the participants, the interview transcripts were recorded under pseudonyms, which did not require interviewees to provide their names and ages. The privacy of the interviewees was respected and care was taken to prevent any possible harmful effects, such as transgressing of cultural values, of the study.

## **CHAPTER FOUR**

### **4. THE STORY OF ENVIRONMENTAL EDUCATION PROGRAMMES IN LOCAL COMMUNITIES IN MOZAMBIQUE: THE CASE OF THE NACALA-PORTO DISTRICT**

#### **4.1 Introduction**

This chapter presents the data collected, the background of the interviewees as well as the findings of the study. The study, as discussed above, attempts to understand how EEPCs are designed and implemented in some local communities in Mozambique. The data were collected from national and provincial Departments of Environmental Education and from four districts, namely: Nacala-Porto, Mogovolas, Mecuburi and Mossuril. However, for the purpose of this study and due to the time and size constraints of a Master's degree project, only the findings from the National Department of Environmental Education programmes and one example of the local programmes, from the Nacala district, will be presented and analysed. Among the four districts that I visited, Nacala is the most appropriate for discussion because it has benefited from EEPCs the longest.

## **4.2 The story of the national environmental education programmes in Mozambique**

In this section, I present and analyse the findings related to, firstly, the nature and rationale of EEPCs in Mozambique; secondly, the local community's knowledge about environmental protection and conservation; thirdly, the involvement of local people and their knowledge in environmental education programmes; and, lastly, the local community's reactions to EEPCs.

### **4.2.1 Nature and rationale of EEPCs**

To understand how environmental education programmes are developed and implemented in local communities in Mozambique, I visited the Ministry for Co-ordination of Environmental Affairs. At the Ministry I met with the national director for environmental protection and management and explained the objectives and relevance of my study. The national director kindly guided me to the Department of Environmental Education where, once again, I explained the objectives and relevance of my study to the officials. Thereafter, I conducted individual interviews with the two officials who are in charge of implementing environmental education programmes at a community level.



I also collected necessary documentation for analysis, including:

- the National Environmental Management Programme (PNGA, 1995);
- the National Policy Strategy for Environmental Education;
- the new Environmental Education Strategy 2005-2015;
- manuals on soil erosion and deforestation;
- the Government Program for 2000-2004; and
- the National Environmental Policy Document.

Our dialogue covered the context, underlying principles, activities, criteria and community participation in the EE programmes run by the MICOA.

Mr. Muchango, who has worked in the Department for more than five years, and has participated in various courses and workshops about environmental protection, explained during our discussion that the Department of Environmental Education was founded as an independent department in December 1994, and embarked on EEPs in 1995. The MICOA has offices in all provinces but not in all districts because of inadequate financial and human resources. Muchango also affirmed that in order to make its presence felt at the district level, MICOA uses members of the community to form environmental clubs and encourages those who already are conscious of environmental issues.

This is how Muchango described this state of affairs:

Shortage of financial and human resources makes the MICOA unable to have offices in all parts of the country. At the district level, civil society organizations and members of communities represent the MICOA, and carry out the environmental activities. For instance, in the awareness campaign for tourism, the “*Welcoming Campaign*”, we created co-management groups as environmental clubs and environmental nuclei that support the MICOA (Muchango, 2006).

These small groups receive support from the provincial departments of the MICOA for capacity-building, manuals, posters and other materials for awareness campaigns. In spite of its limitations in terms of human and financial resources, Muchango says the Department of Environmental Education still makes important contributions and plays a leadership role in environmental programmes and campaigns. He states that:

The activities of the Department of Environmental Education focus specifically on coordination, execution of environmental education programmes and educational actions directed to:

- (i) promote public participation in environmental conservation and management;

- (ii) collaborate with the Ministry of Education and Culture in activities seeking to include environmental issues in the curricula of formal education at all levels;
- (iii) promote and coordinate the study of environmental issues with state higher education institutions; and
- (iv) collaborate with the regional centre for environmental education of the SADC–EEP in technical training, and production and development of environmental education materials (Muchango, 2006).

Clearly, much of the MICOA's role centres on coordination and collaboration with many other stakeholders and government departments. Muchango also affirmed that these activities are designed to create and raise environmental awareness and understanding in the country in an attempt to solve environmental problems. However, he also stressed the difficulties experienced by the MICOA in embarking on these activities, primarily because of the socio-economic situation of the country. A junior official, Mr. Matusse, backed-up the idea of solving environmental problems through programmes and made specific reference to the role of such campaigns in helping to alleviate poverty:

The MICOA is carrying out EEPs in an attempt to minimize the environment problems and provide a better life for the population of our country. However, we know that this is a big challenge for a country like Mozambique where the level of illiteracy and poverty is relatively high and environmental programmes are quite new (Mr. Matusse, 2006).

These discussions with the two officials of the MICOA seem to suggest that the Ministry is well aware of the level of poverty and illiteracy in the country and acknowledges that this situation might constrain the implementation of environmental education programmes in the country.

Reading from the National Policy Strategy for Environmental Education, I found that the government of Mozambique places great importance on preserving and maintaining natural resources through community participation as an attempt to alleviate poverty. This process of improving natural resource management and sustainable development practices requires that the national government adopt a national action plan and strategy. Taking into account the local environmental situation, the national government has adopted a “participatory strategy” as the most appropriate methodology in environmental programmes for natural resource management and conservation. This “participatory approach” emphasizes the participation of local people in the planning, design and implementation processes of environmental management. This national strategy is based on the Tbilisi principles, which emphasise environmental education as a key tool for the creation of opportunities for change in behaviours and attitudes, empowering people with necessary consciousness, knowledge, attitudes, values and abilities to face sustainable development (MICOA, 2002).

According to the MICOA (2002), the National Strategy requires the involvement of all sectors of the education system (formal, informal and non-formal) and relevant stakeholders, namely civil society, international partners, and the public and private sectors at the central, provincial and district levels.

The Strategy also emphasizes local community involvement for natural resource management and conservation. The National Strategy was adopted as a policy measure to raise public participation in decision-making, and dissemination of sound environmental conservation through both formal and non-formal educational activities.

Regarding the nature of the environmental campaigns embarked on by the MICOA, the focus has been on environmental problems related to health, uncontrolled forest fires, soil erosion and deforestation. The MICOA's awareness campaigns have targeted mainly the marine and coastal biodiversity zones<sup>4</sup> across the country, the coastal zone in the southern area that attracts tourism to the country, the Great Maputo Project<sup>5</sup> and the five cities projects<sup>6</sup> (Muchango, 2006). Matusse, who is relatively new at the Department of Environmental Education and having worked there for only two years, also affirmed the role of the MICOA in many environmental activities, including the mobilization of communities and schools to good environmental practices. For Matusse, many of

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<sup>4</sup> Mozambique's coastal zone is described as unique in the East Africa region in terms of the quality, diversity and species richness of its habitats. Apart from Madagascar, Mozambique is the only country in the Eastern Africa region with major brackish coastal barrier lagoons (GEF, 2000).

<sup>5</sup> The Great Maputo Project includes the districts of Boane, Matola, Marracune and Manhiça

<sup>6</sup> The five cities listed as the main tourism cites include Chockwe, Inhabane, Nampula, Maputo and Cabo Delgado.

these environmental activities are promoted in a constructive and interactive way rather than through ordinary educational methods; he says, intervention in community awareness does not involve “teaching environmental education, but sharing ideas, information and knowledge with the communities” (Mutusse, 2006).

Thus the MICOA has embarked on a wide range of activities spanning from health issues to forest and soil conservation, using the participatory approach through the sharing of ideas and information with the community geared towards finding solutions to environmental problems. A further reading of the MICOA’s documentation on environmental education programmes uncovered the following instructive statement that corroborates the statements made by Muchango and Mutusse about the programmes and activities of MICOA:

The environmental education programmes emerged from the need to overcome the current environmental crisis in the country as an attempt to eradicate poverty. The two environmental programmes, on soil erosion and deforestation, were designed to supply information and empower the public in general with knowledge, capacities and abilities to act accordingly in order to minimize soil erosion and deforestation problems in the country (MICOA, 1996).

The MICOA has, in addition, produced manuals to facilitate their implementation of the environmental programmes. These manuals are distributed to schools and communities free of charge. Reading the manuals on soil erosion, for example, I found they are particularly designed to address environmental issues relevant to educators, teachers and the school community from grades 1 to 7 (covering ages

from 6 to 16 years old). The documents indicate that these manuals aim “to enable the proposed population groups to develop strategies that will help in solving environmental problems related to soil erosion and deforestation” (MICOA, 2002). Muchango also confirmed this major objective, saying that:

The EEPs in Mozambique aim at promoting a manageable administration of the natural resources with local community involvement. They also support the municipal organisations and civil societies in management of solid residues and environmental sanitation (urban administration). EEPs empower and sensitize the communities about environmental conservation, and involve them in management of natural resources (Muchango, 2006).

Muchango also stresses that the major goal of the environmental education programmes is to sensitize the communities about environmental conservation and involve them in the management of natural resources.

Concerning the criteria used for the selection of target groups and areas, it was clear from the interviews with the MICOA officials that they do not have specific criteria and make the selections on a case-by-case basis. Usually they consider the expectations of the target group, as well as local community initiatives for solutions to the problem and for partnerships. Matusse highlights this dilemma in their selection:

The selection of target groups is done according to certain priorities, taking into account the level of land degradation. The MICOA first identifies critical areas and then evaluates the level of the degradation for the intervention (Matusse, 2006).

This description of selection criteria for target areas and beneficiaries is supported by Muchango who affirms that:

In the process of implementation of EEPs, there is no specific criterion to consider; it depends on the priority set by the MICOA in a given year, for instance land degradation. It also depends on the type of activity that is being designed or implemented. For instance, some activities target the community's leaders who are given the responsibility to disseminate the conveyed message to their communities. Other activities target the entire community, in consultation with the community leaders. However, the MICOA also does ad hoc interventions whenever critical situation emerge. (Muchango, 2006)

Continuously during our conversations, Muchango affirmed that they only participate with communities during the commemoration of specific events. Some of the events for example include commemoration of World Environment Day every 5<sup>th</sup> June and World Health Day every 3<sup>rd</sup> March. In addition, they are always ready to be actively involved when the communities identify degraded areas.

During commemorative events, MICOA members usually go out to the communities and spread messages about eco-environment conservation. Sometimes these activities are led by other NGOs, such as DANIDA, SAVE THE CHILDREN and the WWF, in consultation with the MICOA. Currently, civil society groups (including NGOs, CBOs, clubs and nuclei of environment) run many of these programs. The MICOA supports these technical and financial initiatives directly or through partnerships with some of these NGOs.



According to the interviewees, the MICOA is currently carrying out five major EEPCs across the country, namely: The Biodiversity Marine and Coastal Project, awareness campaigns of zones of concentration of obsolete pesticides, campaigns of welcoming in coastal zones of the south area, the Five City Project and the Great Maputo Project. These environmental programmes are being implemented in different provinces around the country.

In my discussions with the officials from the MICOA, it became clear that many of the national interventions they have designed to promote environmental awareness among the communities are not properly evaluated for their intended impact. All the interviewees from the MICOA mentioned the difficulty of evaluating the EEPCs' past achievements. Muchango puts it this way:

There is a problem when it comes to evaluating the past activities. Usually, the MICOA does not revisit communities after the campaigns because it involves cost, and the MICOA does not have the funds to do so. Thus, we do not evaluate our programmes. The little funds that we have are used to guarantee the continuity of campaigns in other areas (Muchango, 2006).

Although there have been a number of fairly impressive national environmental interventions and awareness campaigns spearheaded by the MICOA, the verdict on their impact and potential usefulness is still out as there is still no national data or evaluation report available on the environmental education programmes, because of inadequate financial and human resources.

Matusse, however, seems to think that such national evaluation may be unnecessary as the MICOA often assesses and evaluates its programmes, saying, “Yes, the MICOA evaluates its programmes through the evaluation of the provision and indicators previously established” (Matusse, 2006).

Thus, there seems to be a lack of consensus at the MICOA about the need for major evaluation and assessment of the impact of the programmes on the targeted communities, as opposed to just establishing whether the programmes are implemented as planned, as exemplified by the two contrasting statements from Muchango and Matusse. This may be the reason why no data currently exist on the impact of these national EEPCs.

At the national level, it is thus apparent that the environmental education programmes are mostly designed by the MICOA to create environmental consciousness within the communities. Currently most of the environmental programmes in the country are spearheaded by civil society organisations (NGOs, CBOs, clubs and nuclei of environment). The MICOA supports these initiatives through technical and financial schemes and partnerships.

#### **4.2.2 The local community's knowledge about environmental protection and conservation**

The findings show that Makua local communities have a variety of local knowledge and practices. In our conversations about the local community's knowledge, Matusse agreed that rural communities often have rich knowledge and practices with respect to environmental conservation. For example, in some areas communities do not destroy certain medicinal and ornamental plants that they believe have great value. They know that if they cut down such trees to use for construction or making charcoal, for example, they will lose a unique resource base that helps them whenever they are ill. Similarly, it can often be observed that communities have local traditions about soil conservation, for example using different types of plants in their gardens to prevent soil erosion, as windbreaks and to provide shadow. Muchango characterises such local community's knowledge as follows:

In the communities, there is also local knowledge that is associated with traditional myths and beliefs. This knowledge helps the rural communities to conserve and manage natural resources, for instance, the sacred forests in the Inhambane and Nampula Provinces (Muchango, 2006).

The locals limit access to these sacred forests to the members of their close community. For outsiders to enter the sacred forest they need special permission from the community chief, known as the *Regulo*. The *Regulo* in turn assigns to them a person who guides them through the forest.

The assigned guide explains to the visitors what they are allowed and not allowed to do while exploring the forest. The locals believe that if outsiders go into the forest without the necessary permission, they may never return, but will be lost, killed or simply go mad. That is, it is a popularly held belief that something very mysterious will happen to those who do not seek the community chief's blessings to explore the sacred forests.

For Muchango, this secrecy and the tight regulations regarding access that it generates are the community's way of protecting the forest against illegal timber loggers, for example. Asked if people really get lost in such sacred forests, he confirms that it has happened and the community can cite many examples of people who disappeared forever into the forests. In his view, these forests are reserved only for the sustenance of the community. Interestingly, the members of such communities do not get lost themselves, partly because, as Muchango argues, they probably know what to do and how to survive once in the forest. This is the secret of the community. It is not farfetched thus to assume that these practices constitute part of an elaborate scheme by these local rural communities to protect their forests against illegal timber loggers, and so far it seems to have worked.

Concerning the communities' use of the natural resources of the forests, Muchango explained that:

The communities never destroy the forests. They just need something for sustenance. Those who usually destroy the forest are single persons that have a licence for timber cutting. The problem is these people are authorized to harvest small amounts but they end up over-harvesting the forest, destroying large areas that were used in a sustainable way by the communities. However, because of a lack of government control, the community complains but nothing is done. As a result, it creates land conflicts between the community and the government (Muchango, 2006).

Of interest to me in these MICOA documents is the fact that they recognize the existence of traditional wisdom among local rural communities, which can help in protecting the local environment. How such knowledge can be exploited in the national EEPC will now be discussed.

#### **4.2.3 The involvement of local people and their knowledge in EEPCs**

Talking about the local community's involvement in the development process of EEPCs, the MICOA interviewees (Matusse and Muchango) were unanimous in affirming that the MICOA has its own limitations in terms of involving local communities and their knowledge in the programmes. The MICOA involves local communities only in the first stage of planning, which is the consultation with local communities about major environmental problems.

However, the MICOA takes seriously the information given by the communities about the major environmental problems they face. Matusse, when asked how the MICOA involves local communities in the planning process of EEPs, says:

Ehhh...not really. It is quite difficult to include local communities in the planning process. The programmes are designed at the MICOA and I cannot see how the local community can participate in the planning process, but we usually consult with the local communities about major environmental problems (Matusse, 2006).

According to Matusse, the MICOA cannot involve the local communities in the design process because of geography and logistics. The only participation afforded to the local communities is in the identification of their environmental problems and the areas where these problems occur. The information that the MICOA takes into account in the planning process is gathered through some form of consultation with the community. Muchango was also vague about community involvement:

Well, the answer for this question is out of my scope. However, let me try. Ehhh...I think they do not exactly participate. It is a passive participation because we only consult communities for information to incorporate in the manuals about the major environmental problems and the areas where these problems are occurring. Maybe this is good enough to be regarded as participation (Muchango, 2006).

Not satisfied with this answer, I pursued the question further and asked once again why the MICOA does not involve the target groups in planning the EEPCs? The question was considered very challenging by Muchango, who gave the following further explanation:

This is a challenging question. Well, ehhh...it is clear that the MICOA, as an “umbrella” should put more effort into including this local knowledge and practice in EEPCs planning process. We recognise and respect the local community’s knowledge. We know that some communities are able to manage the environment without the intervention of scientific knowledge. However, I do not know the extent to which the MICOA could include local knowledge in EEPCs. As I said, we have no systematic way of including this knowledge in EE programmes but we do use it in the implementation process if we come across it (Muchango, 2006).

Reading the MICOA’s documentation on the issue of community participation in the activities of environmental education programmes, I found that the document highlights the rural community involvement and participation as a major component of the EEPCs. However, the MICOA documents do not provide tangible tools and ideas for how rural communities should participate in the programmes.

The type of consultation that the MICOA carries out with local communities, namely *consultation only about environmental problems*, does not constitute sufficient community involvement in EEPCs. However, the participatory strategy adopted by the MICOA in environmental programmes for natural conservation and management emphasizes local community involvement in all stages of

development and implementation of EEPs. However, it is not clear, even for EEPs planners or implementers, what is meant by “local involvement” in the policy strategy of EEPs. At this point, the degree of involvement in EEPs by local people is highly questionable and the role of these people and their knowledge in EEPs is not clear either.

#### **4.2.4 The local community’s reactions to EEPs**

The findings from the interviews with the officials of the MICOA seem to indicate, however, that many communities, in particular those where the MICOA has representation or has been working throughout, do understand and are aware of the objectives and activities of the environmental education programmes for natural resource protection. Nevertheless, some members of these communities do not participate in the implementation. It is often the case that when the first meeting is held, community members are enthusiastic about participation but when they realise that there is not any offer in return, they tend to retreat (Matusse, 2006).

Muchango agrees:

It is important to take into account that these people are used to receive donations from NGOs, and even from the government. When they see people from outside coming to the community, the first idea in their minds is that they will receive donations. For instance, if they know that people are coming from Maputo they think that they will get help to overcome poverty and as soon as they realize that, we have neither food nor money, they walk out. However, the first reaction is always positive (Muchango, 2006).



This indicates that there is a misunderstanding on the community side because environmental management is not exclusively a task for the MICOA. The communities have to be active partners in the conservation of natural resources. Muchango affirms also that what is happening is likely to be different with different communities. The communities often help in identifying the degraded areas and then a few members collaborate in some activities while other members of the same community, for unknown reasons, will go and destroy the work done. For the MICOA, this is one of the main barriers to the successful implementation of EEPs. Trying to understand some of these contradictory community behaviours, Muchango explains that, in some cases, the communities are not yet prepared to collaborate. He reasons as follows:

There are many reasons that can justify the community's reactions. It might be the impact of government decisions to solve environmental problems that are in conflict with their livelihoods. It also might be the need for benefits from volunteer activities. Although the MICOA's intention is to have a high level of community involvement because it is the community that lives in direct contact with the natural resources and the solutions should come from the community. We also believe that when the solution comes from the community it will be effective and lasting (Muchango, 2006).

This discussion concerning the community's reactions indicates that the MICOA is limited in its inability to foresee some of the community's perceptions and reactions during the planning and implementation processes. Matusse emphasises the need for communities to participate, because the MICOA cannot work without them:

Yes, the communities participate because we cannot work without the community's participation. Usually, whenever we meet a community, we first consult the community leaders. Then the community leaders invite the members of the community and simultaneously explain the purpose of the meeting. The task of the environmental education team is to mobilise the local people for environmental activities (Matusse, 2006).

The MICOA always consults the community leaders, Matusse explains, because they are well known and respected by other members of the community and therefore provide the best entry point into the community. Concerning the methodology used by the MICOA to deliver the message and content of environmental education programmes during the implementation process, the officials were positive in affirming that the EEPs are run interactively rather than hierarchically, as commonly happen during ordinary teaching sessions by school teachers and educators of environmental education. In these programmes the educators do not "teach" environmental education, says Matusse:

What we really do in the implementation process is to exchange information and knowledge. We acknowledge rural community's knowledge hence incorporating it into scientific methods for a sound conservation. However, we know that some communities are able to manage the environment without the intervention of scientific knowledge. Therefore, we most of the time share only ideas with such communities (Matusse, 2006).

In the MICOA's documentation on EEPCs, I found that the major challenges to implementation were listed as follows:

- (i) the inadequacy of governmental policy to orient and stimulate local environmental initiatives;
- (ii) the high rate of illiteracy among the adult population that generates the need for appropriate methods and strategies for education that considers the different cultures and traditions of the populations;
- (iii) a lack of systematisation of the content of the programmes, seminars and workshops that address environmental issues; and
- (iv) a lack of institutional mechanisms for co-ordinating the activities of different partners (NGOs, public entities, religious groups and others) (MICOA, 1996).

Clearly, the MICOA is aware of, and respects the rich store of knowledge and practices within local communities. Matusse says in this respect:

The MICOA respects and preserves the local community's knowledge, and to some extent, uses these in EEPCs. We know and we are aware that the local communities have lots of wisdom, and we do respect this knowledge. Actually, the MICOA is encouraging any research related to local rural knowledge (Matusse, 2006).

Even though the MICOA respects local knowledge, as Matusse explains, the MICOA has struggled to incorporate such local insights and understandings into its programmes and campaigns:

Well...ehhh, yes, we do use the local knowledge but in a limited way. Because when we find out that the communities use their local knowledge, we as the MICOA just encourage the community to continue doing what, they have been to manage natural resources. In this way, we will be at least conserving the local community's knowledge. I know that the MICOA should do more and improve this knowledge. We could for instance collect all this knowledge and practices and document them, then duplicate them elsewhere, where this knowledge does not exist (Matusse, 2006).

For Matusse, then, the best approach the MICOA has adopted for dealing with local knowledge is to leave communities to their own devices and resources and therefore respect the cultural beliefs and traditions of these communities. Unfortunately, the MICOA has nothing documented about such rural knowledge and practices. This lack of systematic engagement on the part of the MICOA with local community knowledge is further confirmed by Matusse:

We have identified some knowledge, and we respect it. As technicians, we would like to use this local knowledge in environmental programmes, collect and document it for future needs but we are doing nothing about it now. It does not depend on the technician; we receive orders and we act accordingly. Ehhh...well, the Ministry of Agriculture has collected some of this knowledge and practices but this was for its specific purposes (Matusse, 2006).

Against the backdrop of widespread calls for greater public involvement, the MICOA has embarked on EEPCs that aim to facilitate the understanding and management of the environment by rural communities and to promote a manageable administration of natural resources (MICOA, 1996; and MICOA, 2004). In view of this, EEPCs in Mozambique are designed to supply information and empower the public in general with necessary knowledge, capacities and abilities to act accordingly in minimizing environmental problems.

The participatory strategy adopted by the government for environmental education programmes is aimed mainly at ensuring environmental sustainability, taking into account the socio-economic situation in the country (MICOA, 1996). However, the lack of systematic and methodological involvement of local communities and their knowledge in such programmes results in a communication “gap” between government and rural local communities on the implementation of EEPCS, which therefore constrain any significant participation by local communities. A lack of evaluation of the programmes (because of inadequate financial and human resources, as discussed above) is also a major barrier towards the successful implementation of environmental education programmes in local communities in Mozambique.

### **4.3 EEPCs at the district level: the case of Nacala- Porto**

The previous section gave an overview of the story of national environmental education programmes in Mozambique. In this section, I discuss the story of environmental education programmes at the district level, the case of Nacala-Porto. This is to give a complete picture of the MICOA's EEPC in the country, and to help us understand how the national initiatives play out and are received at the local level.

In order to understand how rural communities perceive and react to the MICOA's environmental education programmes in the Nacala-Porto district, I began my investigation with a visit to the Municipality offices and set out to observe the environmental education activities done in three different communities within this particular district. I conducted interviews with at least five families from each community, and with two officials from the municipal offices, namely Mr Francisco Juman and Mr Armando Domingos.

In this section, I discuss, firstly, the socio-economic situation and environmental education programmes in the Nacala district; secondly, an analysis of the local community's knowledge about environmental conservation and management; thirdly, the local community's participation in development and implementation process of EEPCs; and lastly, the local community's perceptions and their reactions to the EEPCs.

#### **4.3.1 Structure and rationale of the environmental education programmes in Nacala-Porto district**

Nacala is situated about 200km northeast of Nampula city and 70km from Ilha de Mozambique on the deep attractive bay of Fernao Veloso. Nacala is a port of regional importance in Southern Africa and has been maintained largely through the Malawian and Zambian capitals. Nacala-Porto is the second city of Nampula province. Reading the municipality documentation, I found that the socio-economic activities of Nacala district are limited mostly to agriculture and commercial activities on a small scale.

The population of Nacala district is about 220 000 inhabitants (District File, 1999). Most of the people of Nacala live by sourcing their daily provisions from the environment. The socio-economic structure in this area is controlled by formal political, traditional and religious authorities, and the different social strata are well represented within the population. I was able to observe, during my stay in the community, that the traditional authorities, the *Régulos* (kings), *Rainhas* (queens), and chiefs of the community, all play a prominent role within the socio-cultural space of the local community. Interestingly, the Nacala population is predominantly composed of the Makua ethnic group, who for the most part profess the Islamic religion.

During my discussions with municipal officials, I discovered that the district of Nacala had recently established a Department of Environmental Conservation and Management, which has taken up the issue of EEPs.

Prior to the establishment of this new department, the district carried out environmental programmes through an environmental centre where environmental education programmes were developed and implemented. This Centre for Environmental Education in the Nacala district was founded in 1990 by an NGO project called the Integrated Development Project of Nacala (IDPN). This project, funded by a Swedish organisation, was technically supported by the MICOA through capacity-building of local staff. It emerged from my discussion with Juman that the MICOA's role had been critical in the establishment and development of the capacity of the staff at this centre in Nampula:

We participated in three courses related to environmental protection during the period 1990 to 1999. In that time, our activities were mainly concerned with soil erosion, and at that early stage, we worked only with community chiefs. Later, the chiefs of the community mobilized the community for awareness campaigns. At present, we work directly with the communities with the chief's help (Juman, 2006).

Juman stresses that their activities in the IDPN project were mainly concerned with soil erosion, because the Nacala district lacks forests and so soil erosion is one of the most harassing problems for these agricultural communities. During our discussions, however, Juman did remember a time in the history of the district when they had a large forest, which was later destroyed mainly through reckless environmental practices within the community.



Reading through the municipal documents about the environmental problems of the district, I found that many of the major environmental problems in Nacala are related to deficient water supply systems, soil erosion, forest fires and deforestation. These environmental problems in the district have attracted the attention of many environmental NGOs. NGOs have a fairly long history of involvement in EEPCs in Nacala. Juman, the official in charge of environmental education programmes, further explained this involvement by NGOs as follows:

Yes. We have been benefiting from environmental education programmes for a long time. I do not know really when it started; what I can remember is that when we started it was founded by an NGO project in 1990. It was an NGO project called Integrated Development Project of Nacala (IDPN). Now the project ended and the government is carrying out the environmental activities through the department of environmental conservation and management in the municipality (Juman, 2006).

The IDPN embarked on various activities, attempting to minimise the environmental problems of the district. Domingos remembers clearly that the objectives of the IDPN EEPCs were to “reduce poverty, minimize soil erosion and deforestation and prevent forest fires.” Juman also singles out the objectives of the EEPCs as being teaching the community about “good environmental practices”, and how to combat soil erosion. He describes for example how the IDPN project had been able to procure some species of plants that were used to protect the soil against erosion. Furthermore, other plants and trees were planted to beautify the cities and urban areas as well as to produce fruit for small scale commercial purposes for local villagers.

Juman stresses that even though the IDPN project has ended, local people still carry on with many of its activities within their centre. The municipality has now taken on the mandate of creating public awareness about environmental conservation through its own environmental education programmes in the Nacala district. Juman highlights the fact that their environmental programmes are designed for the entire community, including school communities. Actually, the Centre for Environmental Education is also a kind of a warehouse where they keep all the materials for environmental education, such as photos of the activities developed in the district, and equipment used in nurseries. The new Department of Environmental Conservation and Management has already elaborated the environmental program for 2006 to 2010, called Municipal Plan for Environmental Management (PMGA).

EETCs in Nacala district occur in two phases, planning and design processes, and implementation processes. A phase 1 involves two different stages:

- (i) consultation with local communities and their leaders about the relevant environmental problems in the area and

- (ii) design of an action strategy by municipal staff members. In this latter stage, the local communities are not involved at all.

Phase 2 entails:

- (i) dialogue with local community leaders and general community mobilization meetings to stimulate awareness (using posters, booklets on environmental practices and conversation about local practices) and
- (ii) implementation of EEPCs activities related to combating erosion and deforestation in the area.

Reading the policy documents of the PMGA program, I found that the stated objective of the PMGA is “to improve the environmental situation and the life of the communities in the district, with particular reference to the poor, as an attempt to reducing the absolute poverty of people by 2010” (PMGA, 2006).

Concerning the activities that make up the environmental programmes, a municipal official affirms that these are various, saying:

We have done activities to combat soil erosion and demarcate zones. We also move the communities from dangerous areas to safe areas. This was our main responsibility. We mobilise communities to plant trees, grass and herbs in their gardens and explain the importance of the construction of retaining walls to combat soil erosion. In this district, we have a centre for environmental education where all activities are coordinated. The main task of EEPCs is to mobilize people to protect and conserve the environment (Juman, 2006).

Nacala-Porto also benefits from a MICOA project called the Coastal and Marine Biodiversity Management Project (CMBMP), a key element in the Mozambican government's overarching National Coastal Zone Management Program (CZMP), and in particular its strategy for coastal and marine biodiversity protection and for sustainable use of natural resources. The global objective of the CMBMP is to ensure the effective protection of globally significant coastal and marine habitats and species. The project carries out environmental activities in an attempt to protect the marine and coastal ecosystems in the district. In Nacala-Porto district, the project focuses on the fishing industry. However, I did not interview a staff member of the biodiversity project nor collect any documentation because this study focuses on only two major environmental issues namely soil erosion and deforestation.

In the matter of assessing and evaluating environmental programmes, the municipality department is different from the national department. While the national department, as discussed above, does not assess and evaluate its EEPC activities, the municipality does. This was confirmed by the officials interviewed, who say they evaluate all their environmental activities. Domingos says:

The Department of Environmental Conservation and Management of the municipality does assess and evaluate all the activities implemented in the communities. Moreover, if there is any misunderstanding or misbehaviour from the local communities the officials in charge of the EEPC planning process reviews the programme and adopts new strategies for re-implementation (Domingos, 2006).

### **4.3.2 Local community's knowledge about natural resource management and protection**

The district municipality is thus actively trying to educate about and create awareness of the sustainable use of the environment and its resources in Nacala. However, the community is not without its own knowledge and experience of conservation and sustainable development. Regarding the rural community's knowledge, the interviews conducted indicate that the municipality has in fact identified many traditional techniques used by local communities to reduce soil erosion and restore the soil. These techniques are related to the use of different species of plants. Juman confirms this, saying:

The community used to apply many traditional techniques to reduce soil erosion and restore the soil. Some of the techniques include the use of plants such as elephant grass, *Ipomoea* spp, *Gramma africana*, and of sacks of soil and garbage to cover the ravine areas (Juman, 2006).

The Municipality uses these traditional techniques mentioned in its EEPC because they involve only local materials and are simple to apply. Juman stresses that:

We use these traditional techniques in our EEPC activities to teach other communities, since they are not known in some of the cited communities. We disseminate these techniques because they are simple for application, exist locally and are of low cost. We all know that there are traditional techniques but we have nothing documented (Juman, 2006).

While we were talking about the lack documentation of traditional techniques, Juman remembered that they have some photos of these traditional techniques and that the district community radio sometimes broadcasts these issues and techniques to the community to improve their knowledge of environmental protection. To preserve and sustain this local knowledge, the Municipality takes these plants to the nursery for multiplication, after which they distribute them to the local communities. The local communities know these plants very well and easily accept them for putting in their gardens, explains Juman. However, the Municipality of Nacala district has nothing documented on traditional techniques except the few photos discussed earlier.

The community members questioned about what they are doing to protect the environment were unanimous, saying that:

...we as community have no means, no money to buy these materials. What we are doing is individual effort and each family protects its home using local knowledge and materials such as different species of plants to prevent soil erosion, and some other plants in their home gardens that provide shade and serve as windbreaks. We also use sand bags in our gardens to prevent run-off, or soil, dry grass and garbage to contain ravine areas (community members, 2006)

It is clear that the local Makua communities use different techniques to combat soil erosion and preserve the environment. Pictures 1 and 2 below show some of the plants that are used by local communities to prevent soil erosion. Although the local communities have a variety of knowledge and practices regarding environmental protection and conservation, the

MICOA does not substantially include these traditional practices in their national EEPCs.



Picture 1: Traditional technique used to prevent soil erosion and as fencing material  
Photo taken by researcher during the data collection





Picture 2: Traditional technique used to prevent soil erosion  
Photo taken by researcher during the data collection

Interviews with community members also suggest that the local Makua communities tend to combine different techniques like making barriers (Figure 4) using bamboos sticks, wood and rope in gullies followed by placing sand bags and then filling them up with garbage or dead and dry plants, to combat soil erosion during the rainy season. This traditional method, known as the Barrier Method is used to combat soil erosion in several different districts of Nampula province, not only in Nacala.



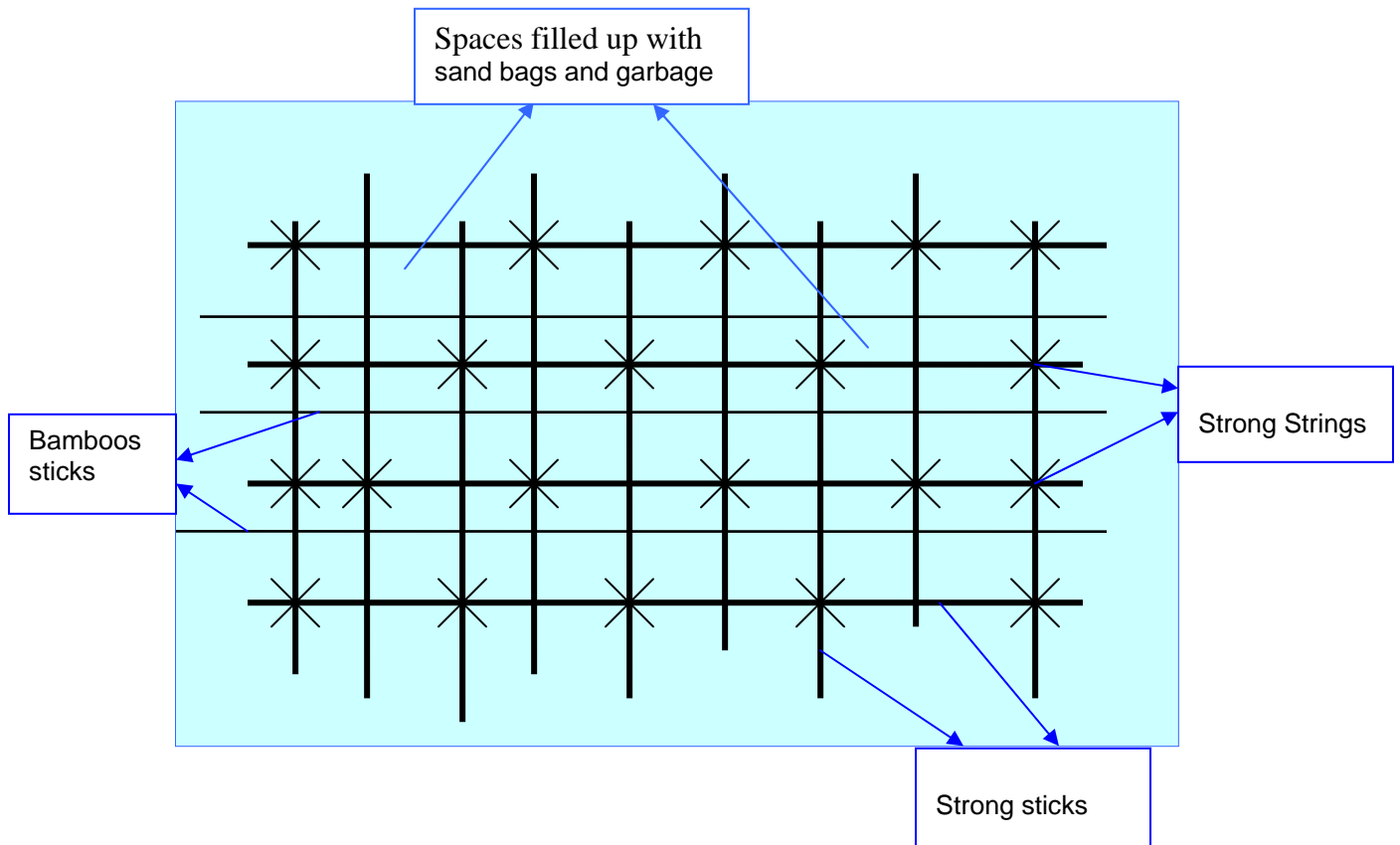


Figure 5: Barrier Method used by Makua local communities to combat soil erosion

Figure sketched by the researcher

However, nowadays many of these traditional techniques are no longer as effective because of changes in living conditions. The picture 3 below shows traditional technique that consist in placing sand and garbage in the gullies used by Makua communities in Nampula province to combat soil erosion, which is no longer effective because of the increasing level of soil degradation.



Picture 3: Traditional technique used in Nampula province to combat soil erosion, Photo taken by researcher during the data collection

Regarding the local community's knowledge and practices, one participant, Mr. Abdul highlights that nowadays it is difficult to do something to protect the environment, because everything has changed:

It was individual initiative, as I said, and we did not have this level of soil erosion. I mean that in the past we were not many. The growth of population in this area was not high and each family had big area with trees and a big plot with fruit trees. It was difficult to see soil erosion because these trees prevented the occurrence of

soil erosion. Now it is different, the number of the population has increased and it is still increasing. As you see, many people came from other areas during the war and when they arrived here, they needed to build their houses. They dug holes in their areas that became gullies (Abdul, 2006).

Mr. Salimo also says it is difficult for the community to protect the environment today. He argues that:

...due to big and large gullies caused by the erosion, it seems that the community does not do anything. Sometimes, we try to make barriers to deviate water but with heavy rains, the barriers are overflowed. In the past, each family protected its residential area, putting grass or other plants around the house or using sand bags to prevent run-off. Now it becomes difficult because we are so many and the houses are too close to each other. For instance, when one digs a hole it affects the neighbours (Salimo, 2006).

These quotations above demonstrate that changes in the living conditions of the local people, for example increased population, can affect the effectiveness of local knowledge and practices for environmental sustainability. This is obvious, because an increase in population density among local people, who mainly rely on the environment for their daily living, will exert worsening pressure on the environment. Thus, in the current environmental situation, local community knowledge alone is no longer sufficient to deal with environmental management and conservation problems. However, the role of local knowledge in environmental education programmes is indisputable due to the relevant environmental values embedded in them.

### **4.3.3 Local community's involvement in the development and implementation of EEPCs**

As in the interviews with the national officials, I explored the idea of community involvement in EEPCs in the district. The data suggest that, in general, the municipality does not substantially involve local communities and/or take advantage of local knowledge about the environment. Domingos was, however, adamant that they do engage the community in their planning of EEPCs, saying:

Yes, we fully involve communities in the planning process. The task of the communities is to show the municipality officials areas where the problems are occurring since they know better about their local environmental problems (Domingos, 2006).

Clearly Domingos's conception of community involvement is very limited, with the task of communities being only to show critical areas and not necessarily to be partners in planning and implementing programmes. However, the new PMGA 2006 -2010 seeks to elaborate this conception of community involvement by drawing on civil society organisations in general for the identification and implementation of programmes. My interviews with members of the community suggest a lack of significant participation and involvement, especially in the planning of the environmental education programmes in the district. One community member captured these sentiments clearly, saying:

The municipality officials usually visit our community and ask questions about environmental problems.

The officials also invite our leader to walk around with them to identify environmental problems. They tell the community that this information is required for environmental programmes, but they do not involve us when developing the action plan, and we do not know how it is done (community member, 2006).

Although the communities emphasize that the municipality officers respect them and their structures of consultation, they say they are not involved in all the stages of development. The communities also affirm that they do not know how the EEPCs are designed. In support of this, Domingos stresses that:

At the implementation process, we first of all meet the community leaders and elderly people of the villages. We explain our message to the leaders and they will pass the message to the respective communities. Then, if there is a need we meet the other members of community for collecting information about environmental problems. This information is considered in the designing process (Domingos, 2006).

The implication is clearly that the local community is involved but not at all stages of the programme. It is therefore apparent that the extent of local community's involvement is again highly questionable.

Pertaining to the implementation processes of EEPs, the Municipality of Nacala considers songs and dances most useful to spread the message of environmental protection. Juman highlights this, saying:

The best method of implementing environmental programmes in this district is through songs and dances. We also join people and talk about best practices but it is not enough. To be successful they need to use cultural groups that dance and sing about environmental issues. This method is more creative and familiar to the communities (Juman, 2006).

#### **4.3.4 Local community's perceptions of and reactions to EEPs**

I noticed, to my amazement, that all the community members interviewed in Nacala-Porto district were familiar with the EEPs that are running throughout the district. This is perhaps not so surprising, since the interviews with municipality officials indicate that most community members participate in the first meetings during the awareness campaigns. However, the turnout in the communities during programme implementation is not nearly so good. This for me demonstrates that something is restricting the participation of the community. In other words, communities seem to have different perceptions and understanding of the EEPs than the Municipality. Juman describes the situation regarding the community's participation as follows:

Well, in some environmental programmes communities participate, principally when they know that there are benefits, like in the planting of fruit trees and other trees that can protect their gardens from soil erosion. Nevertheless, in other cases, for example in

combating ravine areas, they do not participate because it cannot give them any direct benefit, as they understand it. Some community members do not participate and they destroy our activities. Community participation is lacking. They also take the materials from the ravine areas in order to use them for construction of their houses (Juman, 2006).

Despite the fact that the majority of the Nacala Makua community does not participate in EEPs field activities, there is always strong participation in the awareness campaign meetings. This again seems to be contradictory. In my discussion with members of the local community about environmental programmes, I found that all the interviewees were aware of the EEPs but most did not understand the objectives of these programmes. The lack of community involvement at the planning stage, discussed earlier, could be the cause of this deficiency on the part of the local community. A deficiency of the local community's understanding creates a communication "gap" between the local people and the policy planners or implementers, which could be the reason for the local communities' unwillingness to participate substantially in the programmes. I spoke to a community leader who confidently said that:

I know about these programmes because they come to tell us that we need to protect our environment and our houses from soil erosion. They also tell us about the consequences of soil erosion. I can remember that the last time I participated the government brought many materials and invited the local community members together with some municipality workers to construct barriers in the ravine areas (Community leader, 2006).

This information-giving approach employed at the grassroots level does not demonstrate the full participatory approach stipulated in the policy document discussed in section 4.2.1 above. The Municipality policy document on EEPs highlights community involvement as a major component of the participatory approach adopted for the programmes. However, the policy document does not explicitly elaborate a methodology for how the involvement of local community and its knowledge for implementation at the community level should be done.

Other members of the same community affirm that they have heard about the EEPs when members of government came to sensitize the community about environment protection and conservation. They also said that the district administrator talked about environmental problems and the need to protect the environment at this meeting. Asked about community participation, the leader of the community further affirmed:

No, not all community members participate; many people now do not participate. Before, almost all community members used to participate but it was not a government programme, it was an NGO project. We learned a lot. That is why we did not need government programmes to protect our houses against soil erosion. We were doing it by ourselves; these programmes of environment protection are not new in this district. Now it is difficult to do because the gullies grow bigger and bigger (leader, 2006).

This leader of the community compares the level of the community's participation in government programmes with that in the non-governmental programmes. Asked about the differences between the two, the leader explains further:



All the activities that we learned in the EEPCC are similar to what we used to do in the past and they have the same purpose. The difference lies only in the means and materials used in some of EEPCC activities. While the NGO applied more traditional techniques and materials, the government programmes use sophisticated and expensive materials to combat soil erosion (leader, 2006).

This suggests that the local community were more willing and participated more in the NGO programmes because it integrated their local knowledge and practices, as opposed to the government programme which does not. The NGO programmes used traditional techniques and materials such as transplanting seedlings, which were familiar to the locals, while the government programmes use materials such as quarried stones and expensive metal nets that are not ordinarily accessible to the local community.

The community leader also affirms that the environmental education programmes do help the community to protect the environment. However, for the Municipality official Domingos, the Nacala communities are very complicated and difficult to deal with. For him, community participation has been passive and community members “always destroy our activities after few days”. Attempting to explain the reaction of community members, Domingos suggests that the environmental education programmes tend to involve plenty of expensive material such as metal nets and stones.

In these activities, both men and women participate in building long, strong structures, which are meant to reduce water flow and retain soil during the rainy season. Similar activities have been implemented in other critical areas with soil erosion problems in the district of Nacala-Porto.

However, many of these structures were destroyed by members of the community weeks after they had been erected. Picture 4 below shows the results of one EEPCCs activity done by the Municipality in co-ordination with the community to combat soil erosion in a ravine area and picture 5, a similar activity, which was thereafter destroyed by the same community.



Picture 4: Municipal activity for an EEPCCs in co-ordination with the local community to combat soil erosion in the Nacala district  
Photo taken by researcher during data collection



Picture 5: Installation destroyed by some members of the community just weeks after its building in Nacala-Porto district  
Photo taken by researcher during data collection

The Municipality officials state that the communities show different reactions to EEPs activity. Sometimes the reaction is positive and other times negative, depending on the individuals' perceptions of the issue. According to the officials, some communities do not genuinely collaborate and therefore lack a sense of commitment and responsibility. They participate and later go back to destroy what has been done. Domingos confirms this dilemma, saying:

In the district of Nacala, it is difficult to work with the communities. For instance, we did some activities that involved construction of retaining walls using expensive materials such as stones and metal nets, to cover the ravine areas. Some members of community participated, and it was hard work. After one month, everything was destroyed. They were stealing the nets and the stones and using them to build their houses. Sometimes they just destroyed the nets and threw away the stones. We also planted some grass (*Ipomea* spp.) to intercept runoffs and then put up a signboard saying, "It is not allowed to cultivate in this area". After some months, you could find planted maize and peanuts growing in the area (Domingos, 2006).

The municipality's reaction to such behaviour has been to re-implement the environmental education programmes, starting from the awareness campaigns. This attempts to increase environmental awareness in the community and to strengthen the co-operation between the government and the community itself. Interestingly, some installations implemented by the environmental programmes in Nacala district are not destroyed by adults but also by youngsters on their way to and from school. This provides further evidence that some of the youngsters have minimal environmental awareness and do not understand the need for and relevance of environmental programmes in their area.

Interviews with community members regarding their reaction to EEPs suggests that some members of the community feel that they have reached saturation point that they have no further interest in environmental education programmes because there is nothing new to learn. In this respect, Abdul, the community member quoted above, states that:

Yes, I heard about environmental programmes through the government officials in the meeting where we were told about the consequences of environment degradation. It was not any news for me, even for other people. I have lived here since colonial period and, in the past, we were told several times not to cultivate in certain areas due to soil erosion problems. Today in environmental education programmes, we are told the same thing again (Abdul, 2006).

Abdul also highlights the fact that in many of these environmental activities only municipality workers such as tractor drivers get paid, while the residents also work but receive no compensation. On the same issue of community participation, another community member, Salimo, says that:

I do not know why community members do not participate. It is a personal thing. Maybe some do not participate because they are busy with their farming activities. For instance, we were told of the need to conserve our environment but this did not change the attitudes of some people. They continue doing what they were told not to do. I do not know why. For example, we were told not to cultivate in that area but because of lack of food, people engage the area in small farming activities (Salimo, 2006).

Salimo's point is therefore that the participation of community members is based on individual perceptions and timing, since some members for example do not participate because they are busy with farming activities. The implication of this is that environmental education programmes need to be more creative and proactive in involving local communities at all levels of programme development and implementation.

The EEPs in Mozambique are designed to supply information and empower the public in general with knowledge, capacities and abilities to solve environmental problems. The strategy and action plans of EEPs in Mozambique are designed by the National Department of Environmental Education at the MICOA and adapted to the local situation at provincial and district level. However, the Nacala-Porto district Municipality has developed its own action plan, supported by the National and Provincial Departments of Environmental Education. Even though the EEP strategy is sound in terms of a participatory approach, the degree of involvement of local communities is still a cause for concern.

This discussion has shown that the implementation of EEPs in Mozambique has had limited successes as far as local community's participation is concerned. The findings show that Makua local communities have and do apply a variety of local knowledge and practices in natural resources management and conservation. However, the MICOA does not substantially involve the local communities and their knowledge and practices in EEPs. Local communities and policy makers or implementers have different perceptions of EEPs, which creates a communication gap between them. Therefore, local communities tend to resist participation in the implementation of environmental programmes. The local community's resistance in accommodating environmental education programmes limits the success of these programmes in the country.

However, the use of different strategies for planning and implementation of environmental programmes could yield different results if not complete success.



This is shown by the success of EEPs that are carried out by NGOs, civil society organizations or local initiatives, which has been greater than that of EEPs carried out by the government.

## **CHAPTER FIVE**

### **5. SUMMARY OF FINDINGS, DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter summarises the findings and discussion, offers a conclusion and makes recommendations. This study sought to examine the nature and rationale of environmental education programmes in Mozambique and focused primarily on some rural community's perceptions and reactions to the MICOA's environmental education programmes. The in-depth interviews, observations and documentary data reflect three major themes relating to the role of local knowledge in environmental education programmes in Mozambique:

- The first theme relates to the local community's knowledge of environmental issues;
- the second relates to the incorporation of this local knowledge and practice into the EEPCs, and
- The third relates to people's perceptions and reactions to EEPCs in rural communities.



## 5.2 Summary of findings

The results suggest that environmental education programmes in Mozambique seem to have the goal of supplying information and empowering the public in general with knowledge, capacities and abilities to act to minimize environmental problems such as soil degradation and deforestation. In its quest to reverse the environmental slide, the Mozambican government seems to have adopted a “participatory approach” in its formulation of EEPCs for natural resource management. However, the local communities (and their knowledge and practices) do not seem to be substantially involved in the implementation of the government’s environmental education programmes. In addition, the policy strategies of the EEPCs do not spell out any methodology for including local knowledge and practices. Furthermore, we have seen that, because of inadequate finances and human resources, the MICOA seems to have difficulties in evaluating the EEPC activities it implements.

In chapter four, evidence was presented on how the local Makua communities use a variety of knowledge and practices for environmental conservation. The development and implementation of the EEPCs in the Nacala district seems to occur in two phases: planning and designing processes (Phase 1) and implementation processes (Phase 2). Our evidence suggests also that the local community and the policy planners or implementers seem to have different perceptions, views and understandings about EEPCs.

As a result, there is an apparent communication “gap” between the local communities and the government. Consequently, clear resistance from the local communities to the implementation of EEPs can be documented.

In the next section, these major findings of the study are discussed further. Firstly, I examine the role of the local community’s knowledge in environmental conservation, then analyse how local knowledge is incorporated into environmental programmes in the case of the Nacala district and, lastly, explore the issue of the local community’s perceptions and reactions to EEPs.

### **5.3 Discussion of the findings**

I have structured this discussion on the three themes highlighted above.

#### **5.3.1 Local communities’ knowledge and environmental conservation: the case of the Makua local community**

In this study, a local community is defined as a group of people living in the same geographical location within a village and sharing a common identity, needs and problems (Schmink, 1999). In this sense, local community knowledge is the indigenous or local people’s knowledge, which includes intangible factors such as their experiences, beliefs, perceptions and value systems (Rahman, 2000), regarded as essential for successful environmental conservation.

According to the Rio Declaration of 1992, local communities and their knowledge have a vital role to play in environmental management and development. Following this assertion, Appiah-Opoku and Hyma, (1999) argue that:

No matter how much western science has to offer, the knowledge in greatest demand in natural resource management is that which reconnects human beings to the biosphere and its bioregions, incorporating respect and implicit socio-cultural, moral and spiritual expressions. (1999)

Like many traditional local communities, the Makua community has strong connections with its land and fishing zones, depending deeply on it for cultural and spiritual beliefs and subsistence resources. This connection plays an important role in environmental management and protection efforts. The results of this study show some evidence of how the local Makua community has its own knowledge and practices based on myths and spiritual beliefs designed to protect medicinal, fruit and ornamental plants. The local Makua community knows that the medicinal plants, for instance, represent a unique resource-base, which helps them whenever they are ill. Therefore, they do not cut such trees to use for construction, fuel wood or making charcoal. This is more like the Ashanti people in Ghana, who have managed to retain much of their original culturally based knowledge and practices about the environment. Appiah-Opoku and Hyma (1999), exploring the beliefs and practices pertaining to natural resource management in the Ashanti region, reveal a number of indigenous environmental practices expressed through religious beliefs, and a range of sacred and cultural practices that contribute to natural resource management.

There are many other cases of local knowledge in the Makua community associated with their traditional myths and beliefs. For example, the establishment of sacred forests is closely associated with the protection of forest resources, allowing them to recover from exhaustion and exploitative pressure. Similar observations have been made of sacred groves in India, which are associated with the local community's faiths, taboos and beliefs (Sankar & Chandrashekara, 1998). These sacred forests are a part of the cultural life of the local Indian people and fulfil a range of functions including economic, religious, social and environmental functions (Sankar & Chandrashekara, 1998). Similarly, there are also other local traditional practices in the Makua community that have been used for the protection and management of natural resources, with successful results in the past and present. The people apply a variety of traditional techniques and knowledge such as the use of sand bags around their gardens to prevent run-off, and the planting of elephant grass, *Ipomoea* species and other plants with high capacity for retaining water and fortifying soils to prevent soil erosion. These communities also use other plants in their home gardens to provide shade and serve as windbreaks.

Furthermore, the Makua local community combines different techniques like making barriers using bamboos sticks, wood and rope in gullies then placing sand bags and then filling them up by depositing garbage and dead, dry plant matter in the gaps to combat soil erosion during the rainy season. These conservation practices are similar to what Macharia (2004) observed in Kajiado, one of the districts in Kenya. Exploring the strategies used to combat desertification in arid and semi-arid rangelands, Macharia (2004) finds that local farmers have been planting useful trees such as woodlots around homesteads in

their farms to provide wood fuel and shade, and to act as windbreaks. In addition, they use some plant species as live fences instead of using dry thorny tree branches as fencing material, which contributes better to the prevention of desertification.

These traditional techniques represent a strong connection between local people and their lands. The practices also reveal the community's experience developed over time through trial and error, for participation with and adaptation to their environment. Such local knowledge is now widely recognized as providing a basis for efficient local-level decision-making on environmental protection and management. In contrast to these findings regarding the potential usefulness of local knowledge and practices, Thomas (2003) however finds that the traditional practices of the Hewa, one of Papua New Guinea's most remote societies, are a source of ecological disturbance, not an attempt to maintain ecological balance. Thomas highlights that, although the Hewa play a significant role in shaping the environment, their traditional practices are not always compatible with biodiversity conservation and have less than positive environmental significance (2003).

However, it is important to understand that local people have developed their own ways of looking at and relating to their environment, and that the results of their activities are partly an attempt to provide for their daily livelihood, an imperative that Thomas fails to recognise. Moreover, changes in social living conditions in recent times, for example, population growth, lack of rainfall, acid rains and floods, constrain the sustainability and usefulness of local knowledge.

Although changes in living condition affect the relationship between local people and their environment, local knowledge provides ample evidence of sustainable environmental practices such as genetic seeds banks, irrigation systems, and careful land use that can serve as a base for promoting sustainable development today (Vargas, 2000). Such knowledge and practices, when integrated with modern science, can generate better results than either traditional or modern techniques alone.

Therefore, sustainable development calls for a fusing of these expertise with other kinds of knowledge, bridging the gap between different cultures in a way not only based on mutual respect but also accessible to all the affected communities through a participatory approach (Vargas, 2000). Thus, it is not only possible, but also imperative, to integrate local knowledge into scientific knowledge through environmental programmes and strategies for natural resource conservation.

Having examined the role of local communities in conservation and management of natural resources, we can now discuss the question of how this local knowledge can be incorporated in environmental programmes.

### **5.3.2 Incorporating local communities' knowledge and practices in environmental education programmes**

Previous studies have revealed that it is vitally important to consider local people and their knowledge as a key element in programmes to ensure the sustainability of natural resources. In recent years, various models of sustainability have appeared in the literature. Those that aim at sustainable use of natural resources include typical elements related to equity, empowerment, social coherence and participation; and emphasize the need for flexibility in accommodating local cultural values and practices (Diduck, 1999; and Vargas, 2000).

The findings of the present study show that the environmental education programmes in Mozambique are designed so as to supply information and empower the public in general with knowledge, capacities and abilities to act to minimize environmental problems such as soil degradation and deforestation in an attempt to alleviate poverty (MICOA, 2004: 6-7). The government of Mozambique adopted the National Strategy for EEPCs in recognition of the vital importance of the conservation of natural resources. This strategy is based on a sound “participatory strategy”. Many developing countries, such as Botswana, Kenya, Tanzania, Namibia, Zambia and South Africa have adopted similarly strategies of “people’s participation” for sustaining natural resources (Thakadu, 2005). This methodology implies the involvement of all segments of society, from the government and civil society groups to individuals in the development of programmes, from the planning to the implementation processes (Vargas, 2000). Studies of natural resource conservation management reveal that participatory approaches enable local people to share, enhance and analyse their knowledge and experiences of life conditions, and to plan and act in solving their local problems (Pimbert & Pretty, 1997; Selman, 2004; and Thakadu, 2005).

A participatory approach deals with the collaborative and dialogic relationships between donor or government and local people in developing strategies for environmental education programmes and agendas.

In the Mozambican environmental education programmes at the national level, a participatory approach is characterised by the involvement of local communities in the first phase of planning through consultation about major environmental problems, and in the last phase of EEPC activity, through manual labour. The information given by local communities during the consultation is used to elaborate the action plan and manuals. Furthermore, participatory approach used differs depending on the context and programme. According to Pimbert & Pretty (1997) and Selman (2004), the selection of the most appropriate approach depends on the local priorities and definitions of what is to be conserved, and how and for whom it should be managed.

This study finds that the policy strategy and action plans for EEPCs in Mozambique are developed in the National Department of Environmental Education at the MICOA. This policy strategy is therefore adapted to the local situation at provincial and district levels. However, the district of Nacala-Porto is an exception, because of its municipality status, which means it has its own Department of Environmental Education. Unlike other districts, the Municipality of Nacala has developed its own action plan, supported by the National and Provincial Departments of Environmental Education. The Nacala district also theoretically applies a participatory methodology as applied at the national level in Mozambique.



The findings show that the development and implementation of EEPCs in Nacala district occurs in two phases, planning and designing processes (Phase 1) and implementation processes (Phase 2) of EEPCs. Phase 1 includes two different stages: in the first stage, communities and their leaders are consulted about the relevant environmental problems in the area; and in the second stage, the action plan is designed by staff members of the Municipality. The local community is not involved in this second stage. Phase 2 entails (i) the holding of general community mobilization meetings as part of an awareness campaign using posters, booklets on environmental practices and dialogue with local communities about their local knowledge and practices; and (ii) the implementation of EEPC activities related to soil erosion and deforestation problems. There is a lack of significant community participation in this final phase.

A similar approach is used in northern and western Botswana for the implementation of Community Based Natural Resources Management (CBNRM), which involves two phases. Phase 1 involves dialogue and consultation with selected communities on how they intend to participate in the proposed programme and phase 2 involves the implementation of the CBNRM programme in the communities (Twyman, 2000; and Thakadu, 2005).

This approach is however found by this study to be inadequate in terms of maximizing community participation. Thakadu (2005) similarly observes that the failure of the CBNRM programme in western Botswana is a result of poor planning processes and an indication that government is not ready for CBNRM implementation. Twyman (2000) and Thakadu (2005) in their studies classify the participatory approach adopted by Botswana government as a “planner-centred participation”, where local communities have few choices available, and are rather encouraged to follow government recommendations.

However, in the Nacala district, the non-participation of local people on phase 2(ii) seems to be mainly because the EE programmes themselves do not create conditions to attract people’s involvement. It should be noted that the planning and designing phases are very crucial, as they determine the close-up contact of the local communities with the interventions and the success of community participation in the last stages of these interventions. Accordingly, the implementation process will lack community participation if the planning process is not correctly carried out. Moreover, as Macharia (2004) observes, for environmental conservation programmes to succeed, it is important that the local people be involved in the effort, and see their rights being respected and also see the benefits of the processes. To achieve this, local people need to be directly involved and encouraged during the planning and implementation of the project (Macharia, 2004).

Many scholars have investigated the importance of involving local people in natural resource management programmes. Some authors affirm that involving the local people enhances the success of management programmes contributing to poverty alleviation (Ariasingam, 1999; Maharia, 2004; and Selman, 2004). However, though a participatory approach clearly calls for the local people's participation at all levels, the nature and the extent of people's involvement in the Mozambican programmes are far from clear. Studies of people's involvement generally do not include information about the use of local knowledge in environmental programmes; the factors or conditions that may determine the effectiveness of participation of local people; and the role of local people themselves.

Evidence from the literature shows several different models for a participatory approach that categorize the degree of the people's involvement. For instance, in her attempt to examine different participatory frameworks within contemporary development, Michener (1998) classifies two different frameworks of participatory conservation and management, namely "Planner-centred" and "People-centred" participation. The two participatory approaches both require the people's participation but in different ways. The planner-centred participatory approach tends to be nominal, with local people acting as passive recipients of development (Michener, 1998; Twyman, 2000; and Thakadu, 2005). A people-centred participatory approach, on the other hand, is a process that empowers poor people by enhancing local management capacity, increasing confidence and raising collective consciousness in order to meet local people's needs and priorities (Michener, 1998; Twyman, 2000; and Thakadu, 2005).

People-centred participation is seen as the most appropriate participatory approach for environmental education programmes in natural resources management and conservation.

Furthermore, Pimbert & Pretty (1997) identify some of the reforms needed to encourage and sustain community-based conservation and differentiate seven type of participation: passive participation; participation in information-giving, participation by consultation, participation for material incentives, functional participation, interactive participation and self-mobilization. In support of this type, Selman (2004) argues that participation is the full engagement of local communities in natural resource management processes.

In line with this view, Selman adapts Pimbert and Pretty (1997) and differentiates four main synthetic types of participatory framework:

- (i) Minimal participation, in which local people are passive participants, is based on information-giving and answering questions;
- (ii) Participation for material incentive is where local people provide resources such labour or consumption goods' in return for food, cash or other material incentive;
- (iii) Interactive participation is where people are actively involved in joint analysis leading to action plans; and

(iv) Self-mobilization is where people take initiatives independent of external institutions (Selman, 2004).

Analysing all these types of participatory framework we can conclude that for an effective environmental education programme in resource management, a people-centred or interactive-participation approach is the most appropriate participatory approach. However, in many cases self-mobilization, where local communities take their own initiative, also results in successful management.

Turning back to the Nacala context, we can see that although the participatory approach involves local communities in the consultation process, it tends to be “planner-centred”, since the local people are only consulted and are not actively involved in all stages of the development of the programmes. As in the Botswana case, the Mozambican programmes do not use appropriate mechanisms to provide suitable conditions for full participation by local people. Consequently, the success of the programmes has been reduced. However, Pimbert and Pretty (1997) caution that a participatory approach in conservation will be an arduous task based on trial and error, self-critical reflection and further experimentation and innovation. Perhaps this offers hope for the future of Mozambique’s EEPs.

The results of this study also show that there is a lack of methodological involvement of local knowledge in the policy strategy of the EEPs. In other words, the policy strategy does not focus on local knowledge and its application in the EEPs. The policy strategy also fails to explain in detail how the programmes should be carried out in the communities where the major targeted

group are adults and how the content of the programmes should be delivered to the communities. This lack of methodological guidance for the inclusion of local knowledge creates a “communication gap” between the government and the local communities being targeted. Consequently, it becomes difficult for the EEPs to address all the educational components (e.g. communication, dialogue and appropriate adult education) that are indispensable for the implementation of this kind of programme. Likewise, in Western Botswana, the government highlights a similar “policy gap” in its existing natural resource policy, which does not define the objectives of community-based natural resource management or provide firm guidance for its implementation (Twyman, 2000).

Back to the topic of local people’s involvement, if we consider that environmental awareness programmes must involve all segments of the population, including those without a formal education, then the approach used by the MICOA in designing a policy strategy for the EEPs is clearly not suited to maximize participation by local communities. In the case of Mozambique, the adoption of a participatory approach should take into account the high levels of illiteracy in the country, in particular in the rural communities who source their daily livelihood from the environment.

One major difficulty of environmental education programmes in Mozambique in general is determining the degree of people’s involvement in these programmes. The MICOA’s policy documents on environmental education programmes from national to district level highlight the need for the involvement of local communities, although the policy documents do not provide tangible ways and plausible ideas of how this involvement can be achieved. However, the new

National Strategic Action Plan 2005-2015 highlights the fact that education should contribute to creating and raising environmental consciousness by incorporating environmental issues into the curriculum and school books (MICOA, 2004). It however again does not explain how local people should be involved in environmental programmes. In this context, Vargas (2000) argues that for effective public involvement in environmental sustainability, education is critical for improving the capacity of the people to achieve environmental ethical awareness, values, attitudes, skills and behaviours.

The foregoing discussion makes it amply clear that the governmental environmental programmes in Mozambique, both in general and with particular reference to Nacala district, are not adequate to promote full community participation. My emphasis on analysing environmental education programmes attempts to uncover the ways and the extent to which local knowledge is incorporated into EEPs in Mozambique. In my understanding, the question is not only the involvement of local people, but also the “why”, “when” and “how” of their involvement. If we are not able to give a substantial answer to this question, we will not have substantial success in the implementation of EEPs in the communities. In other words, it is important to highlight not just the involvement of local people *per se* but also the role of local knowledge in environmental conservation programmes.

According to Thakadu (2005), we must consider the most appropriate structure that can be employed in decision-making; the structure, which best recognises the community as a whole, taking into account all the social factors that play a role in community involvement. Among these social factors, the literacy level of the community involved is the key issue to break barriers between policy-makers or implementers and the targeted beneficiary group. In this context, Fien *et al.* (2001) indicate that such a breakthrough is possible if local people have the necessary knowledge, motivation and skills. Knowledge, which is regarded as a way to overcome psychological barriers such as ignorance and misinformation, is viewed as a necessary albeit generally an insufficient condition for successful action (Frick; Kaiser & Wilson, 2004). Therefore, education must be seen as a key social strategy for environmental conservation (Fien *et al.*, 2001). The main goal of education in this case is to empower people with the necessary knowledge, values, skills and attitudes to improve their quality of life. This will foster a personal commitment to work towards the solution of environmental problems, and raising environmental awareness and understanding among the human population (Palmer 1999; and Castillo, Garcia-Ruvalcaba, Martinez, 2002).

Therefore, a participatory approach should include all pedagogical processes that can lead to people's empowerment. Ariasingan (1999) argues that environmental education programmes in local communities must include pedagogical processes that consider adult education and functional literacy for the target groups.



In Freire's approach, a functional literacy programme is an education programme for people who cannot read or write, or who read or write below the minimum level required to function in even limited social situations. Functional literacy, which is described as problem-solving education, helps people to have "voice" and "choice" in problem-solving (Ariasingan, 1999).

Furthermore, education with particular reference to non-formal education through adult learning has a pivotal role in providing information and encouraging environmental practices (Scones & Thomson, 1994; Vargas, 2000; and Fien *et al.*, 2001). Adult education helps local people to develop critical awareness, a process that Freire calls "conscientization"<sup>7</sup> or critical consciousness-raising. In other words, critical awareness is critical reflection on the reality that shapes people's lives (Freire, 1982). Freire believes that adult education is the catalyst for perspective transformation in which past life experiences are transformed through cognitive processes to build new knowledge.

According to Clover (2003), adult environmental education begins from the platform of organizing people's knowledge through dialogue to create new ecological understanding of the world. Environmental consciousness, which includes awareness and understanding, is a critical issue for the Mozambican population, particularly the rural communities who are in contact with the environment. In this context, Clover (2003) argues that adult environmental education makes concrete links between the environment and the social,

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<sup>7</sup> Conscientization is the process in which human beings participate dynamically and critically in transforming their experienced reality to provoke recognition of the world (Freire, 1980).

economic, political and cultural aspects of people's lives. Adult environmental education uses participatory approaches based on understanding that learning is a complex and extensive process that empowers people rather than merely information transmission. Empowering people requires the "real" participation of local communities in the planning, implementation, monitoring and evaluation of decisions and activities.

Fien *et al.* (2001) also stress that all activities associated with education only become educational when their design and use are embedded within appropriate pedagogical processes that involve people at all stages of life, in a process of increased understanding, and commitment to skills development. This entails building dialogue and partnerships between local communities and government through a pedagogical process that includes information provision, communication and empowerment. In light of this model, Rahman (2000) and Fien *et al.* (2001) claim that pedagogical processes that aim to empower people by promoting change in attitudes and behaviour should involve a combination of cognitive, affective and conative transformations. Empowering local people to become competent and take responsibility in environmental conservation helps to foster in them self-awareness, confidence and critical thinking, which promote change of attitude and behaviour.

The results of this study indicate a lack of substantial incorporation of local knowledge in the policy strategy of Mozambican EEPs. In other words, the EEP agents incorporate local knowledge if they come across it during the implementation processes, and if these practices are applicable for the agents' context.

For instance, in Nacala, the EEPC agents collect the local plants used to prevent or combat soil erosion they find during phase 2-(ii) of the implementation process and share these with other peoples or communities that do not know of this technique. However, this action is merely honorary recognition of IKS and though it demonstrates some consideration of the local community's knowledge, leaves the local people feeling that their knowledge is neglected in the EEPCs. This is because the process of multiplying and sharing traditional techniques is done in the posterior phases of the implementation of the EE programmes. This unsystematic incorporation of local knowledge highlights the difficult question of how and when local communities' knowledge should be incorporated into EEPCs.

An additional constraint influencing environmental education programmes in Mozambique is a lack of evaluation of EEPC activity post-implementation, due to inadequate financial and human resources. This constitutes one of the major barriers to successful implementation of EEPCs in local rural communities in Mozambique. Moreover, a lack the necessary expertise to engage efficiently and effectively with local communities also constrains the environmental programmes carried out by the government in Mozambique, since EEPCs are quite new in the country.

All this, implies that a new way of viewing the planning processes of EEPCs is needed, one that examines and assesses the reality in the community before developing policy and action plans. Fien *et al.* (2001) suggest that the best way to move towards an effective plan for solving current environmental problems is

to see both indigenous and scientific knowledge as complementary resources. However, the integration of local knowledge into scientific systems is still a challenge. In this process, effective dialogue is needed to help change perceptions, behaviours and attitudes. Freire (1970) acknowledges the need to build partnerships among grassroots organizations and government through the dialogue method's "two-way communication". In Freire's approach, development must begin with the local people themselves, with their knowledge and experience (Freire, 1970; Chambers, 1983; and Clover, 2003). The key message of Freire is that people, especially adults, are more responsive to a message that is directly relevant to their own life experiences.

The framework for integrated knowledge presented in this study (chapter two) demonstrates that in changing attitudes and behaviours the two systems of knowledge (local and scientific knowledge) can be integrated through dialogue and partnership. Therefore, new abilities and skills can be developed to solve environmental problems and alleviate poverty. Effective dialogue will generate trust and encourage mutual understanding between stakeholders (Ducrotoy, 2003). Such integrated knowledge has the potential to generate new technologies for solving environmental problems and therefore alleviating poverty. Furthermore, such knowledge and its strategies and methodologies can certainly raise environmental awareness and understanding for critical thinking at all levels of society in the country. Environmental consciousness and critical thinking are the key factors that can minimize environmental disasters and therefore alleviate poverty in the country.

As a matter of fact, in environmental education programmes, the involvement of local people should not only mean “participation” of the people *per se* but also the incorporation of their knowledge and practices.

### **5.3.3 Perceptions and reactions of local communities with regards to EEPs**

The findings show that even though local communities were consulted (phase 1) and involved in the dialogue about environmental problems and their local practices [phase 2-(i)], the majority of the Nacala local communities did not participate in the activities of EEPs [phase 2-(ii)]. However, communities are always ready to attend meetings in the awareness campaigns, in order to know what news the government is bringing into the communities and if it is of any benefit to them. This is likely to occur for reasons to those found by Thakadu (2005), who explored the challenges and lessons from the implementation of Community Based Natural Resources Management (CBNRM) in northern Botswana, where local communities were involved in consultation, although there was a lack of community participation and collaboration. In Botswana, however, unlike in the Nacala district, community attendance at meetings was often very low.

The lack of local community participation in environmental education programmes in the Nacala district can be due to two main reasons: Firstly, the Nacala local communities do not consider themselves part of the programmes, and they do not understand the policies of the project.

This demonstrates that local communities and policy planners or implementers have different understandings and perceptions of the objectives and importance of the EEPs. For this reason, communities refer to the EEPs as “government work”. These differences in perceptions and understandings result in a “communication gap” between local communities and the programme planners or implementers. Such a situation prevents local communities from expressing their feelings and intentions in relation to the EEPs, negatively affecting the people’s participation in the phase 2 (ii) activities. Similar observations were made in western Botswana by Twyman (2000), who investigated the complexities of participatory conservation. He observed that local people found it difficult to express their concerns about the environment and issues of sustainability given the power relations involved in the participatory process. This has created a situation where people are reluctant to collaborate with government programmes.

Secondly, the Makua local communities do not see their interests reflected in the programmes and they do not see benefits from the programmes that can bring changes to their lives. These factors are likely to have at least partly caused the community’s unwillingness to participate. Similarly, the behaviours of those in power, from officials to policy implementers, who at the beginning of the project already had a preconception that “It is difficult to work with Nacala local communities”, could also have restrained participation by the local community. This preconception on the part of the Municipality officials could also limit the initiatives and willingness of local people to participate in EEPs activities.

In this context, Fien *et al.*, (2001) argues that the success of participatory conservation of biodiversity depends on the creation of practical policies and the support of local people. This implies that local communities should understand what conservation programmes are setting out to do, why they are deemed necessary, what they will involve and what the ramifications are likely to be.

The present study found that the attitude of local communities in the Nacala district regarding environmental programmes in general is negative. However, in the first meetings, communities always show a positive attitude because they want to see if government is bringing any changes to their living conditions. Local communities also show positive attitudes during awareness campaign meetings where some members of the community through dance, song, theatre and playing drums convey environmental issues and best practices. This process is part of the traditional culture of the Makua communities. They usually use songs and a typical dance called *tufu* to express social issues. However, in the EEPC activities, the attitude of local people varies depending on the activities that are being carried out. For instance, the community participates more actively in interesting activities such as the planting of fruit trees or plants that can protect their houses from soil erosion. When the activities do not give any benefits, for example in the case of combating ravine areas, local communities tend not to participate. In some cases, they even destroy the work done by others. They use the material from the ravine areas to construct their houses, and grow maize in the ravine areas. Similarly, Twyman (2000) and Thakadu (2005) observe that communities develop positive attitudes to participation in resource conservation when they receive benefits that contribute positively to their quality of life.

In other words, local communities are more likely to participate in conservation activities if they know they will benefit materially from them.

Interestingly, the results of the present study show that the destruction of environmental activities is not done only by adult people but also by kids on their way from and to school. This negative attitude by the kids may demonstrate that there is still a lack of understanding about environmental issues within the formal education sector. Young children in this community do not seem to understand the importance of the EEPC activities that are being implemented. However, it becomes a concern for the Municipality to try and uncover the reasons behind the community's behaviour rather than just to draw conclusions without such information. The Municipality officers are of the opinion that the local communities do not understand the issue of environmental conservation because of poverty. I think that the lack of involvement and participation in the planning and decision-making processes is partly the cause of this observed lack of understanding of EEPCs.

In the case of the Nacala district, there is a strong concern about the extent of local involvement in the implementation of the EEPCs. To date, the barriers and limitations facing the implementation of the EEPCs in the local communities' are not very clear. The present study has established that, in the Nacala district, some efforts have been made to overcome these barriers, through the evaluation and re-implementation of the EEPCs. A strategy that involves increasing awareness campaigns and dialogue with local communities has been put in place.



However, the success of such re-implementation strategies is still open to discussion as the local communities continue to resist the implementation of the environmental education programmes in the district.

#### **5.4 Recommendations and policy implications**

It is evident from the key findings of this study that a key recommendation is that all environmental education programmes that are designed for local communities should seek to draw in the local communities and their knowledge as a central feature and at all stages of the development of the programme. Only with such buy-in from the local communities can the programme have any reasonable chance of success.

Furthermore, the participatory strategy most suitable for use in environmental education programmes for local communities seems to be the “people-centred participation”, based on an integrated framework that seeks to bring together local and scientific knowledge systems. Such conditions of integration are more likely to create opportunities for the empowerment of the local people. A more robust and structured system of sharing between EEPC or government agents and the local communities is needed, especially in the context of Mozambique. This will enable the EEPCs to take advantage of the basic indigenous knowledge of the people, which and be linked with the latest scientific knowledge. In addition,

I would recommend that the environmental education programmes include appropriate pedagogical processes for adult education, wherein communication, dialogue and capacity building are emphasised, taking into account the literacy levels of local communities. The education programmes that are organised for the local adult members of the community should take into consideration the vast experiences that people bring into the discussion as suggested by Freire's approach to literacy development.

Finally, the policy strategy document for environmental education programmes for natural resource management should attempt to incorporate local knowledge and practices. This means that the action plans of the EEPCs should explain in some detail how such local knowledge could be applied in practice; how the programmes could be carried out in the communities; and how the content of the programmes could be most effectively delivered to the communities by the functionaries. Such a statement implies that local communities should actively engage in all activities of the EEPCs, from planning, designing, implementation, monitoring, evaluating and decision-making. Collaboration with other stakeholders should be prioritised in this regard. A programme of collaboration between governmental and non-governmental organization and other EEPC agents could create conditions for learning from peers and for continuous evaluation and development of the implemented programmes.

## **5.5 Limitations and future studies**

The present study has focused rather closely on the local community's perceptions and responses to the environmental education programmes developed by the MICOA. It has provided an understanding of the implementation of environmental programmes in some of the local communities in Mozambique, specifically in the Nacala community. Based on the findings of this study, we now know better about the various challenges and opportunities for working with local communities and their knowledge and practices in pursuit of effective EEPCs. While we have a rich picture of these challenges and opportunities in the Nacala district, we still know very little about the nature and extent of the challenges and opportunities in the other districts and provinces of Mozambique. Due to the time and size constraints of a Master's degree research project, I was unable in this study to analyse in any detailed data from the other districts and/or provinces.

Future studies on this issue could maybe compare the EEPCs carried out in the different provinces and districts. Furthermore, information on the local community's involvement in the EEPCs needs to be gathered in order to arrive at a good understanding of the effectiveness of various participatory approaches to EE and how to evaluate the success or failure of the EEPCs.

## 5.6 Conclusion

From the above discussion of the implementation of EEPCs in Mozambique, it can be concluded that the participatory strategies adopted for environmental education represent a significant move in the right direction. The extent to which the local communities could be involved more substantially, however, is still not clear. This study has revealed that there is a lack of methodological insight into how local knowledge can be incorporated into policy strategy and that there is still no substantial involvement by the local communities and their knowledge in the development of EEPCs in Mozambique. This lack of involvement by the local people in EEPCs has led to a communication “gap” between government and local communities in the implementation of these programmes. Therefore, local communities have continued to resist the implementation of EEPCs in their communities.

However, if EEPCs are to make an effective contribution towards the socio-economic needs of the Mozambican people through environmental protection and natural resource management, then a greater commitment from the local communities needs to be mobilised. In this context, there is a need to improve the policy strategy and action plans of the EEPCs in order to create opportunities for democratic and active engagement to bridge the “gap” between local communities and government. This will require more concerted communication and connection efforts by the EEPCs agents.

The case of the Nacala district begins to illustrate for the country how it is possible to take seriously this need to involve the local communities and their knowledge and practices in EEPCs. Although only partly successfully, the district has at least made a deliberate breakthrough in this regard and provides a worthy example for other districts, provinces and countries in Africa.

The present study and field experiences have suggested a possible integrated framework and methodology for studying such local communities and their interactions with the implementation of EEPCs. The framework has taken us through theories of adult education, community development, participatory implementation of programmes and policies, and environmental conservation in indigenous contexts and knowledge systems.

Though Mozambique faces all these challenges, I think there is still hope for researchers to study, inform and develop practice-based theories of how to conduct EEPCs in ways that pay attention to local communities, their knowledge and practices and their perceptions and reactions to the desired programmes.

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# APPENDIXES

## APPENDIX

## MINISTÉRIO PARA COORDENAÇÃO DA ACÇÃO AMBIENTAL

### MAPUTO

Ana Romão Wamir da Conceição docente da Universidade Pedagógica em pós graduação na Universidade de Pretoria no ramo de educação ambiental, vem através desta carta solicitar autorização ao Ministério para Coordenação da Acção Ambiental para efectuar uma investigação relacionado com os programas e campanhas de acção ambiental levados a cabo pelo Ministério. O estudo, previsto para o mes de Novembro será realizado na província de Nampula de preferência em dois ou mais distritos que terão se beneficiado de alguma forma dos programas de educação ambiental. O presente estudo tem como objectivos investigar a natureza dos programa ambientis e o potencial impacto dos saber local (conhecimentos tradicionais) nos programas de educação ambiental. O estudo é um contributo para Ministério Coordenação da Acção Ambiental na procura de solução para um uso sustentável dos recursos naturais e alívio a pobreza. Aguardo atenciosamente a vossa a compreensão.

University of pretoria

Novembro , 2005

Ana Wamir da conceicao

Ana da Conceição

APPENDIX B

TO

APPENDIX E

has been omitted, refer to Hard Copy.

## APPENDIX F

SOME OF TRADITIONAL TECHNIQUES USED IN NAMPULA PROVINCES TO  
PREVENT AND COMBAT SOIL EROSION



Picture 2: rural community living in degraded areas



Picture 3: Shows the level of erosion in Nampula province and rural community living in danger in ravine areas.

Photos taken by researcher during the data collection



Picture 4: shows traditional technique used by rural Community to prevent growth of soil erosion.





Picture 5: shows traditional technique used by rural Community to prevent growth of soil erosion.

Photos taken by researcher during the data collection



Picture 6: Ravine area completely recovered from soil erosion using traditional techniques



Picture 7 - traditional technique used in Nampula province to combat soil erosion  
Photos taken by researcher during the data collection



## APPENDIX G

### REFORESTED IN NACALA DISTRICT



Picture: shows ravine area recovered and reforested in Nacala district; work done by community during EEPs.

Photo taken by researcher during the data collection

## APPENDIX H

Socio-economic situation in rural areas of Nampula province  
Pictures below show poverty in rural community



Picture 1: Chief of rural community in Mogovolas district



Picture 2: Queen, King and police member of rural community in Mossuril district  
Photos taken by researcher during the data collection





Piture3: Makua woman who rely on environment for her subsistence in Mussuril district

Photo taken by researcher during the data collection

## APPENDIX J-a

## 1. Interview Instrument for MICOA

1. Tell me about yourself?
2. How long have you been working in this department?
3. Could you talk about this department and the activities of this department?
4. How long has MICOA been undertaking the environmental education programmes and campaigns?
5. What are the goals, origins, and principles of environmental programmes and campaigns undertaken by MICOA?
  - 5.1. Could you tell me more about the history of these programmes?
  - 5.2. What are the objectives of the programmes and campaigns undertaken by MICOA?
  - 5.3. Who designs the environmental education programmes and campaigns?
  - 5.4. To whom are the programmes and campaigns addressed or who participates in environmental education programmes and campaigns?
  - 5.5. What are the criteria used to select the target group and district to address the environmental education programmes and campaigns?
  - 5.6. In what situation the programmes and campaigns are addressed.
  - 5.7. What are the aspects to be considered when the programmes and campaigns are taking place?

6. How do rural communities interact with the environmental education programmes and campaigns implemented by the Government?
  - 6.1. How do the rural communities participate in the design and implementation of these programmes and campaigns?
  - 6.2. How does the community react at first when they are invited to environmental education programmes and campaigns?
  - 6.3. What are the community's tasks during the elaboration of Environmental education programmes and campaigns?
  - 6.4. How do the communities participate in these programmes and campaigns?
  
7. How and why do the rural communities engage with environmental education programmes and campaigns in the ways they do?
  - 7.1. Did the MICOA assess the programmes and campaigns?
  - 7.2. What knowledge does the community have about environmental conservation and protection?
  
  - 7.3. Does the MICOA consider the knowledge that exists in the community?

- 7.4. How does the MICOA combine local community knowledge with the scientific in the programmes and campaigns?
- 7.5. What does MICOA do to preserve the community's knowledge about environmental conservation and protection?
- 7.6. Does the knowledge from local community have any interest to MICOA?

## APPENDIX J-b

### 2. INTERVIEW INSTRUMENT FOR COMMUNITY MEMBERS

1. Tell me about yourself?
2. How long have you been living here?
3. Could you talk about environmental education programme and campaigns that this community participates?
4. How do rural communities interact with the environmental education programmes and campaigns implemented by the Government?
  - 4.1. How does this environmental education programmes and campaigns of works?
  - 4.2. Tell me about the activities that you and other people in this community did during these EEPC?
  - 4.3. How was your community selected to benefit from the EEPC?
5. How long has your district or area been involved in environmental education programmes and campaigns?
6. What is the objective of these environmental education programmes and campaigns?
7. Does your community accept and participate in these environmental education programmes and campaigns?



8. What do you like and dislike in these environmental education programmes and campaigns? And why?
9. How do the campaigns help the community to preserve the environment?
10. How did the community protect and conserve the environment before their involvement in environmental education programmes and campaigns?
11. How do the new EE programmes and campaigns by MICOA relate to the old ways the communities used for protecting and conserving their environment before?
12. What were the advantages of the traditional ways? What were the disadvantages?
13. What is your opinion of the MICOA programmes and campaigns? Explain.
14. What do you think MICOA has to do to ensure the good relationship with the community?

## APPENDIX L

<b>category</b> <b>Unity</b>	<b>1 Nature and Rationale of Environmental education Programmes and Campaigns</b>	<b>2 Incorporation of local knowledge on Environmental Programmes</b>	<b>3 Local communities understanding, perception and response</b>	<b>4 Local communities knowledge and practices</b>
<b>A</b>	Aims of Environmental Education Programmes in Mozambique	The local communities participation on the planning process of EEPCs	Rural local communities understanding of the need of EEPCs	Rural local community knowledge about environmental use and protection
<b>B</b>	Motivations and Reason for developing and implement EEPCs	The scope of Inclusion of local knowledge on EEPCs	Local rural communities awareness on EEPCs	The use of rural local communities knowledge and practices by MICOA on EEPCs and others
<b>C</b>	Content of Environmental education programmes	The respect to local communities structures and practices on the implementation process	Local rural community reactions to environmental education programmes	The preservation, of rural local communities knowledge and practices
<b>D</b>	Methodology for elaborate and transfer EP knowledge to the local communities	–	Local rural communities participation on EEPCs	Documentation of rural local communities knowledge and practices
<b>E</b>	Criteria for elaboration of EEPCs, and criteria for choosing targeted beneficiaries	–	Local rural communities view and opinion about EEPCs	–

The table above indicate the four categories that represent the research questions of this study. Each category is composed by small units, which describe the content of data collected in the category.