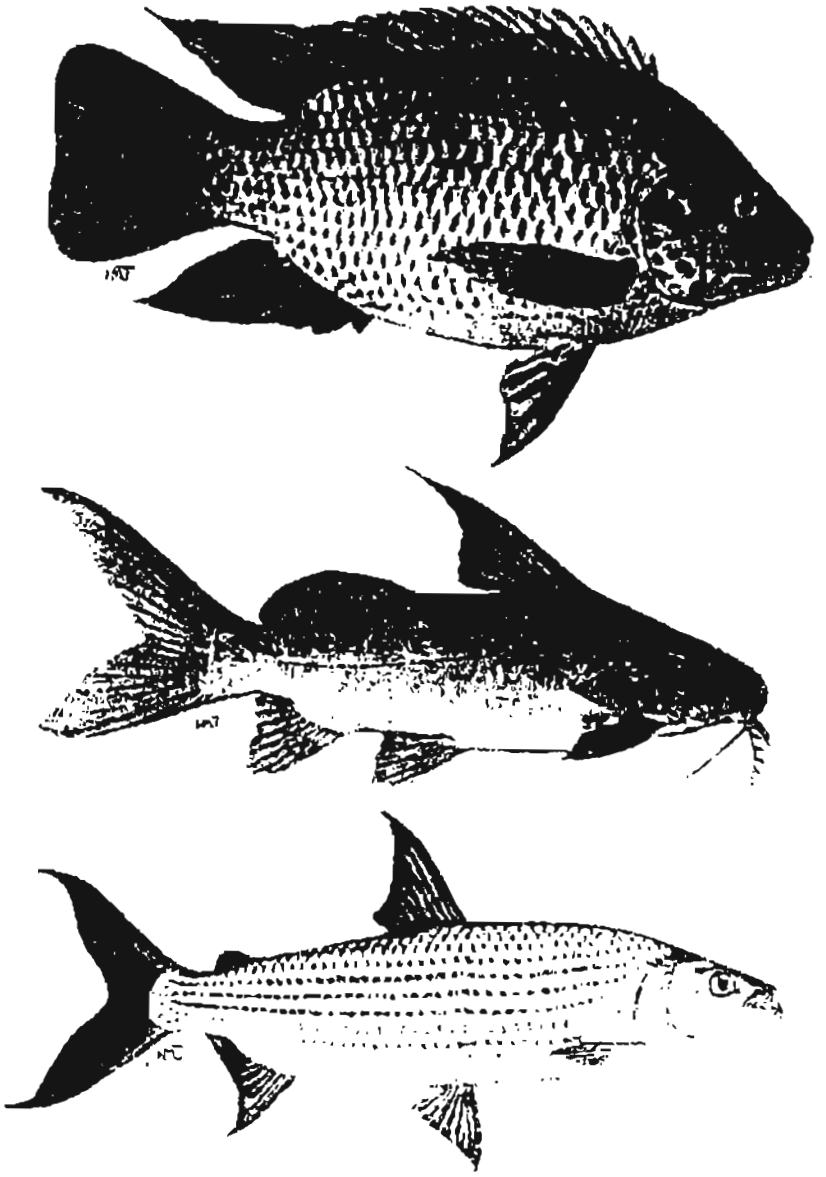
ARTISANAL FISHING AND COMMUNITY BASED NATURAL RESOURCES MANAGEMENT:
A CASE STUDY OF TCHUMA TCHATO PROJECT IN MOZAMBIQUE



by *Luis Dos Santos Namanha*

1999

ARTISANAL FISHING AND COMMUNITY BASED RESOURCE MANAGEMENT: A CASE STUDY OF TCHUMA TCHATO PROJECT IN MOZAMBIQUE

by
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Submitted in partial fulfilment for the degree of Master of Environment and Development in the Centre for Environment and Development
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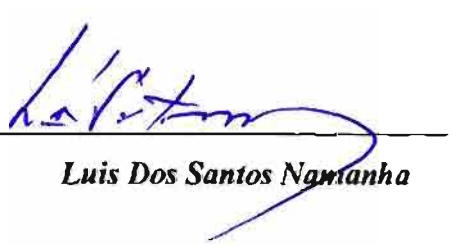
DECLARATION

The research described in this dissertation was carried out through the Centre of Environment and Development, University of Natal, Pietermaritzburg from August 1998 to December 1999, under the supervision of Professor Charles Breen and the co-supervision of Mr. Myles Mander of the Institute of Natural Resources, Pietermaritzburg.

This study represents original work by the author and has not otherwise been submitted in any form for any degree or diploma to any university. Where use has been made of the work of others, it is duly acknowledged in the text.

The views expressed in this text are my own.

Signed: 

Luis Dos Santos Nantanha

ABSTRACT

This study is about artisanal fishing and community based natural resources management in Chintopo ward. It sets out to

- develop an understanding of the fishery in the context of CBNRM; and to formulate a conceptual framework for the research
- evaluate how well prepared government and the Tchuma Tchato project are to act as ' agents of change' in promoting CBNRM
- develop an understanding of the present ways in which access is controlled; how government revenues from the fishery is generated and how it is distributed
- provide informed suggestions on how to proceed in promoting the process of CBNRM within the Tchuma Tchato project.

The research comprises four parts: developing a theoretical understanding and conceptual framework based on the analysis of relevant literature. Investigation of the organisational structure and capabilities of government and the Tchuma Tchato project in the context of conceptual model (preparedness for intervention); an analysis of the importance of the fishery to local people, regulation of access and distribution of benefits; and a critical evaluation of the current situation and recommendation of action to promote CBNRM.

The literature analysis focused on the origins, principles and strengths and weakness of ICDP, ADMADE and CBNRM projects.

It is concluded that the principles and theories that underpin CBNRM are not well understood in the three sectors involved, government, NGOs and local structures. Consequently they are not adequately prepared to implement CBNRM in the most required areas, the license system in place in Chintopo does not provide for any real regulation as well it does not control harvesting pressure. The principles and theory which underpin CBNRM are not consolidated into a user friendly format which facilitates knowledge transfer amongst practitioners. There is too much emphasis on theory and not enough on

process and practice. Insufficient attention is devoted to team work and vertical integration There is no strategic plan and there is no generative learning.

It is evident that meaningful progress could not be made with integrating the fishery into CBNRM until the macro-issues have been addressed. Access is by license but this does not provide for any regulation. The fishery was tending towards open access. Licensing does not control harvest pressure. Consequently the current trend is toward unsustainable levels of harvest. The distribution of revenues generated by licenses and inspection fees is not distributed in a manner which provides meaningful return to the community.

Consequently the recommendations made here are not specific to the fishery. The whole approach to CBNRM should be revisited before proceeding with any further expansion of the project. Comprehensive strategic analysis need to be made focusing on what was originally intended, namely building capacity for intervention. This will involve a cross sectoral team building; building a shared vision; developing real capacity; and developing a business plan which emphasizes both process and product. There should be a culture of learning so that the team learns from failures rather than fears them. Strong focus should be given on building strategic alliances among research and educational institutions and NGOs.

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ACRONYMS

CCNR	Community Conservation of Natural Resources
CBNRM	Community Based Natural Resources Management
TT (Portuguese)	Tchuma Tchato
DNFFB (Portuguese)	National Directorate of Forestry and Wildlife
SPFFB (Portuguese)	Provincial Services of Forestry and Wildlife
CAMPFIRE	Communal Area Management Programme For Indigenous Resources
ADMADE	Administrative Management Area Design
IUCN	International Union for Conservation of Nature or World Conservation Union
IDRC	International Development Research and Co-operation
LNRCC (Portuguese)	Local Natural Resources Conservation Council or Village Natural Resources Conservation Council
IDPPE (Portuguese)	Institute for the Development of Fisheries of Small Scale
DNP (Portuguese)	National Directorate of Fisheries
NGOs	Non Governmental Organizations

FF	Ford Foundation
DPAP (Portuguese)	Provincial Directorate of Agriculture and Fisheries
DDAP (Portuguese)	District Directorate of Agriculture and Fisheries
CBCD	Community Based Conservation and development
ZBSAP	Zambia Bio-diversity Strategy Action Plan
PD (Portuguese)	Master Plan
US	United States Dollar
UN	United Nations
UNDP	United Nations Development Programme

GLOSSARY OF TERMS

Artisanal fishery:	Village based fishery using dugout canoes, plank boats and fiber glass boats.
Co-management:	The approach that focuses on the relationship between beneficiaries and the developer sometimes called bottom-up approach.
Common-property resources:	A community owned a resource.
Community:	The term has been used as a synonym for society, social organization, social system, but with a specific territorial locus. It is a social unit with members sharing a specific territorial area as a base for carrying out the greatest share of their daily activities with members interacting directly and having a collective identity both self and other defined with relationships being principally primary rather than secondary and conformity with group norms is achieved mainly by peer pressure. This takes in account that community is not necessarily a self - sufficient unit.
Conservation:	The process of management of living resources which ensures that utilization is sustainable.
Dug out canoes:	A canoe carved out of a single tree trunk.
Integrated development:	Development that ensures social, economic and ecological balance.
Institution structure:	Hierarchy of leadership within institutions and their specific positions.

Leadership:	It is defined as 'occupancy of a status and the active performance of a role that mobilizes more or less organized collective and voluntary effort towards the attainment of shared goals and objectives'. It is a relation that exists between people in a specific social situation, and may not necessarily be applicable in another situation' (Fowel, H.W. and Fowel, F.G., 1995; Stogdill, 1948 quoted in Gould and Kolb, 1964:380). Further can be defined Leadership in four elements: role performance, whose influence (status), is central relating to and collective action of responsibility.
Open-access resource:	A free for all resource.
Property:	A right of a benefit stream.

CHAPTER ONE

INTRODUCTION

1.1. Introduction

Mozambique has recently emerged from many years of conflict, first with the Portuguese and then with itself in civil war. Development has been virtually impossible under these circumstances and the country slid into increasing poverty. It is now one of the poorest countries in the world.

The cessation of civil war and the emergence of a democratic government in 1994 brought with it opportunities to reconstruct the country. The government acknowledged the urgent need to rebuild rural societies and to promote economic development based on the sustainable use of natural resources. The approach they adopted has been termed Community Based Natural Resources Management (CBNRM)(DNFFB, 1993). In essence CBNRM is seen as a co-management strategy, the principal partners being the community and government.

Typically CBNRM is founded on the use of wildlife (Wells, Brandon and Hannh, 1993), which was also the stimulus for the project under consideration in this research. Tchuma Tchato in the Chikunda language means our wealth and it is intended to signify the value and benefit local people in the project area can derive from wildlife. The designation 'our' in our wealth is very significant because it implies a return to the original situation in which local people owned and benefitted from use of the resources. Tenure and access are therefore central issues in the process of CBNRM. The focus of this research was, however, not wildlife.

The fishery is being brought under the umbrella of the Tchuma Tchato project. The intention of this research was to inform this process. It proceeded in three phases. The first phase focused on developing an understanding of CBNRM and construction of conceptual frameworks of forces shaping the fishery and of the process of implementing CBNRM. The second phase involved field work to establish how prepared government is to promote CBNRM. General features of the fishery were also elucidated. The third phase involved an evaluation of the findings. The research

project extended over eighteen months of part-time engagement. The total time for the research, including preparation and write up, is five months.

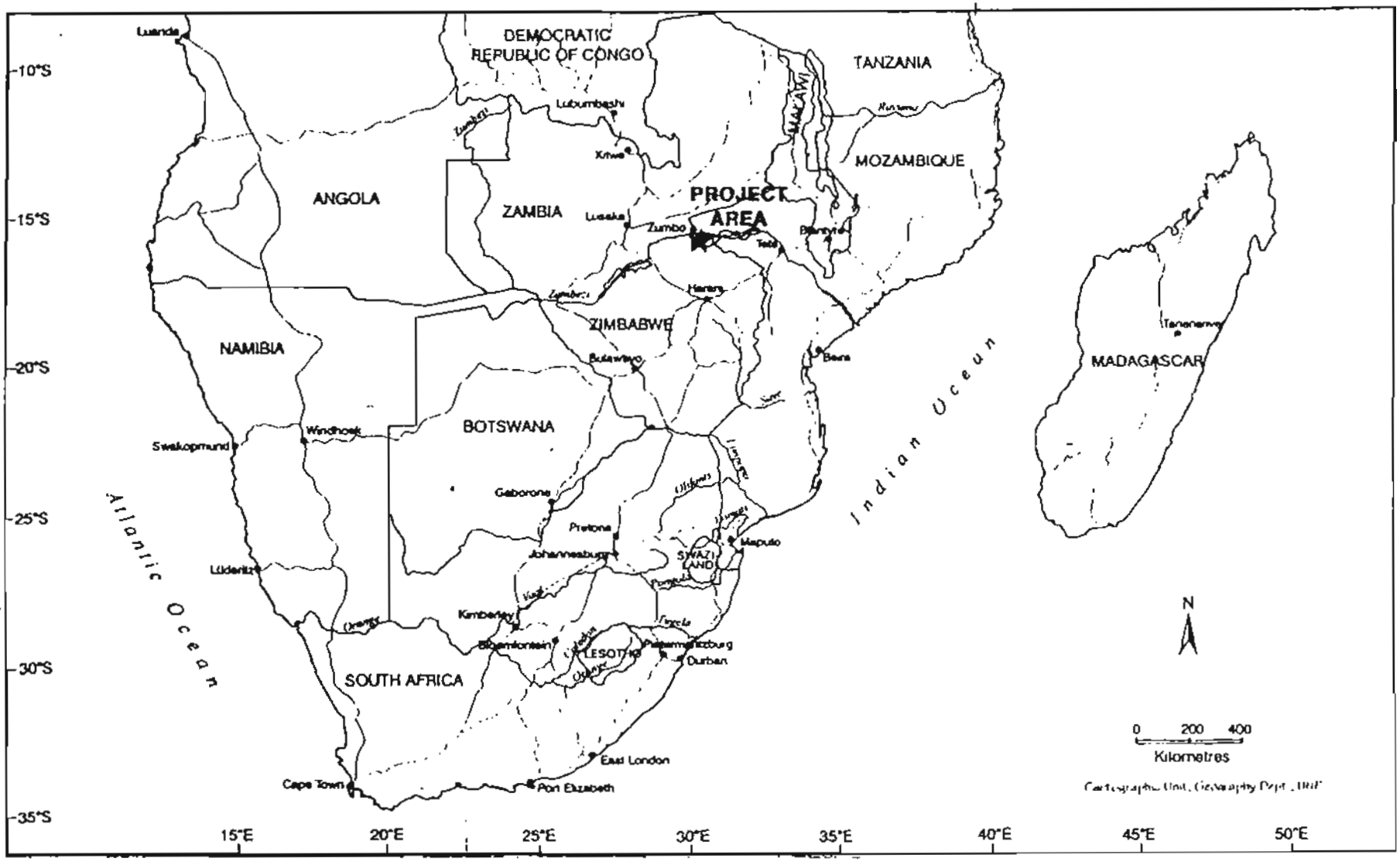

Figure 1.1: Geographical location of project area (from Maughan Brown, 1998)

1.2. Location and Infrastructure

The study area is designated as Tete Province, Magoe District, Chintopo Localidade. It adjoins the southern shore of Lake Cabora Bassa and borders Zambia in the northwest and Zimbabwe in the south (Figure 1.1 and 1.2). Tete, the provincial capital, is located about 550 km to the east.

Infrastructure is poor (DNFFB, 1993; pers. obs. 1999). Roads have, in most instances, been opened and are maintained by the concessionaire who operates hunting safaris. The roads are only useable with four wheel drive vehicles.

Communication is poor. The strongest axes are those between the study area and the adjoining countries Zambia and Zimbabwe. These reflect trade routes. Health services are poor and local residents make use of clinic facilities in both Zambia and Zimbabwe.

The Tchuma Tchato project has installed a satellite telephone and radio communication system (pers. obs. 1999). There are elementary schools in six villages but there are no secondary schools, the nearest being in Tete. There are no financial services or industries, other than the safari operation and artisanal fishery (Agostinho, personal communication 1998; personal observation 1999).

1.3. Demographic characteristics

The 2500 km2 comprising the Tchuma Tchato project area is sparsely populated, with about 3 people/ km2. In 1996 it was recorded that there were about 1863 families with a total population of 8086 (Christian Care Food Relief Programme, in Murphree 1996). The population is growing and people are moving into the area as they seek access to resources (pers. observation 1999).

Settlements are concentrated along the lake shore and the tributaries of the Zambezi river. The soils are generally poor and rainfall is low and seasonal. The river, therefore, provides a reliable

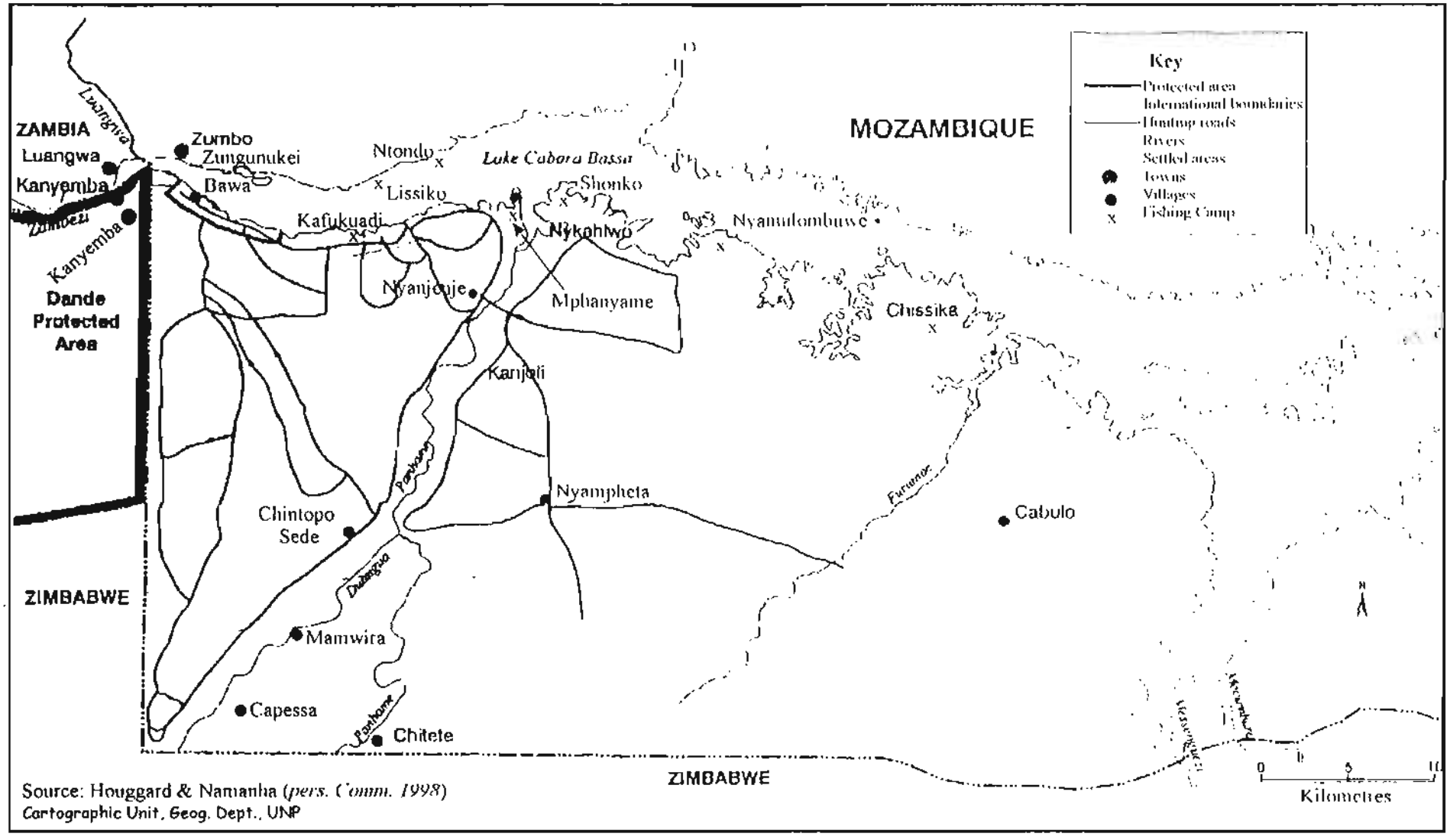

Figure 1.2 Delineation of Project Area (modified from Maughn-Brown 1998)

source of water. Soils alongside the rivers provide opportunities for crop production. Infestation with tsetse fly is high and this reduces opportunities for livestock production.

The people are closely linked to Zambia and Zimbabwe through tribal affiliation and through trade.

1.4. Land tenure

The land (including the water) and associated natural resources are owned by the state. This has been the situation since colonial times. People have rights to live on the land, but they do not have legal tenure (Ministry of Agriculture, Government gazette, 1977/8).

The government by promoting CBNRM is essentially acknowledging the rights of local people to benefit from the resources but, so far, there has not been any change in tenure rights.

The area is classified as ' open area' but a concession has been awarded to Mr. Hougaard who now has sole hunting rights in the area.. Concessions are renewable at ten year intervals.

The removal of rights to ownership has weakened the role of traditional authority. In the case of wildlife their control has been replaced by that of a safari operator; in the case of fish, as will be shown, it has not been replaced by effective government controls.

1.5. Biophysical characteristics

An underlying philosophy of CBNRM is that if people own and benefit from a resource, and if they have sufficient authority to regulate use, then they will steward use towards sustainability. The more important this resource is in the socio-economy, the more likely it is that people will promote sustainable use given ownership and authority.

The Tchuma Tchato project area is reputed to contain some of the most abundant wildlife populations in Mozambique. Indeed it was this that led DNFFB to promote CBNRM in the area (DNFFB, 1993), and also the establishment of the safari operation. It has also been a strong

motivating force in establishing a tourism initiative within Tchuma Tchato.

Fishing has been a tradition among the people for longer than people can remember. Unlike wildlife from which people were marginalised, they have never been marginalised from the fish resource. A vibrant trade exists between residents and people from neighbouring countries (Photo 1 and pers. obs., 1999).

The hot, and for many months dry, climate (Slater, 1994) associated with generally poor soils does not favour agriculture.

Adjoining Cabora Bassa as it does, the area provides a range of opportunities for enhancing quality of experience for tourists.

The Tchuma Tchato area therefore has three foundations upon which to build CBNRM- hunting, fishing and tourism based on non-consumptive use of resources.

1.6. Origins of Tchuma Tchato

In 1993 the National Directorate of Forestry and Wildlife conducted a six month assessment of the wildlife population along the southern shore of Cabora Bassa. The study centered on the status and distribution of wildlife, management needs and the nature of conflicts (DNFFB, 1993). This author and a colleague Abacar, suggested that there were significant wildlife populations; that conflicts existed between people and the safari operation, and with wild animals; and that it was likely that the manner in which resources were being used was probably detrimental and not sustainable. They recommended that government establish a CBNRM project.

This recommendation led to the DNFFB and the IUCN developing a proposal. In this proposal the DNFFB acknowledged its own weakness in CBNRM. The intention was to enhance their capacity and for Tete Province to implement CBNRM. The following quotations illustrate this clearly:

Photo 1. At times both men and women engage in the trade or barter of fish for goods (eg maize, cloths, etc.)

' The most important activity that this programme would undertake is the building of the capacity of the Wildlife Department to conceive and successfully implement community-based wildlife management programmes that support improvement [sic] of rural lives.

The implementation of the pilot-project in south-western Tete will be a key opportunity for the wildlife Department to learn practically the challenges of introducing community-based resource management. This can enable us to reflect creatively on policy, and to spread interest and enthusiasm about the opportunities available from these changes in policy. It can also provide the context for the research training under the staff development programme.

The process of project implementation is one of mobilization of rural communities and local government structures, and building their capacity for the management of their wildlife resources The decision was then made to achieve this by implementing a project i.e. to learn by doing. The site chosen was Magoe District.

Magoe District of western Tete Province contains one of the most significant wildlife populations in Mozambique. This resource has a high potential to [sic] improve the economic welfare of local communities and enabling rural development. This potential can be realized through Community Natural Resources Management of this wildlife resource. This potential combined with the need to develop and orientate a new generation of wildlife managers to the theory and practices of community resource management, forms the basis of this proposal. Through this three-year pilot project, Wildlife Department staff would, with the assistance from national and regional institutions, receive applied training in ecology, wildlife management, and social sciences. This would enable them to develop the first community natural resource management programme in Mozambique. This would also equip the Wildlife Department with the staff required to develop and sustain such initiatives across Mozambique (DNFFB, 1993).'

In due course the proposal attracted funds from the Ford Foundation and the project was launched.

1.7. Rationale for the research

Six years have passed since the findings of the survey were made known; and the Tchuma Tchato project has been operational for five years. At the time this research was conceptualized the

project had been in place for four years. During this time some progress had been made in bringing the fishery under the umbrella of Tchuma Tchato (see following chapters). There were, however, growing concerns that despite doing this little progress towards a more sustainable use of fish was evident. There was not a good understanding on which to formulate a strategy for action.

At the same time this research was being conceptualized, another researcher Maughan Brown (1998), published his findings of a case study of Tchuma Tchato. His study suggested that there were a number of weaknesses in the approach being adopted.

This study builds on the findings of Maughan Brown and sets out to:

- develop an understanding of the fishery in the context of CBNRM; and to formulate a conceptual framework for the research
- evaluate how well prepared government and the Tchuma Tchato project are to act as ' agents of change' in promoting CBNRM
- develop an understanding of the present ways in which access is controlled; how government revenues from the fishery are generated and how they are distributed
- provide informed suggestions on how to proceed in promoting the process of CBNRM within the Tchuma Tchato project.

These form the chapters of the dissertation. They are supported with a chapter on the research methods used.

CHAPTER TWO

LITERATURE REVIEW AND RESEARCH CONCEPTUAL FRAMEWORK

2.1. Introduction

Goodland (1995) identifies four kinds of capital: natural, human, human-made and social. Maintenance of capital lies at the heart of sustainability in the long term. Maintaining environmental assets, or at least not depleting them, indicates sustainability. There is abundant evidence in both the developed (Agarwal and Narain, 1989) and developing countries (McNeely, 1996) that, for example, stocks of fish and tropical timbers have been depleted below economically harvestable levels.

A new approach to resource management is urgently required. One, which is the focus of this research, is Community Based Natural Resource Management (CBNRM).

2.2. Community Based Natural Resources Management

The process of change that has impacted on natural resources use and management is conceptualized in Figure 2.1. This provides context for the appreciation of the need for intervention and for the emergence of Community Based Natural Resource Management as a way of promoting sustainable use of resources in marginalised rural communities.

'When the human economic subsystem was small, the regenerative and assimilative capacities of the environment appeared infinite' (Goodland, 1995). During the pre-colonial period in Africa populations existed as small relatively isolated communities with access to resources in excess of their needs. The barriers isolating these communities were ruptured and weakened as colonization progressed. The consequences have been dramatic (Figure 2.1; Breen *et. al* 1998; Munthali, 1992).

Three 'macro-scale' pressures can be recognized viz. marginalization from resources; improved health care and fertility and a changing economy (Figure 2.1). There are many 'knock-on' consequences. Failure to address simultaneously, and in a balanced way, economic, social and environmental sustainability has led to increasing, uncontrolled pressure on resources and failure of management of use these resources.

The Brundland report drew attention to a relationship between poverty and the degradation of natural capital (World Commission on Environment and Development, 1987). In reality the situation is much more complex. There is no simple cause and effect relationship between poverty and resource depletion (Broad, 1994; Breen *et al*, 1998).

Colonisation of Africa marginalised rural people, particularly indigenous people, from components of natural capital (McCracken, 1987b). Because the social and economic aspects of development were not addressed, it was not surprising that rural people still secured access to the resources albeit 'illegally' (Figure 2.1).

People were not usually marginalised from fish resources (Waterhouse, 1996; Welcomme, 1996). Fisheries have, consequently, provided an opportunity for people to engage the emerging cash economy, whilst also providing food (particularly protein) security. Artisanal fisheries became commercial operations (e.g. Photo 12) and the increasing need for disposable income fueled fishing effort and advanced technologies. In the absence of effective management fish stocks have been depleted (Cernea, 1985). An IUCN workshop held in 1996 concluded '.The entire region of West Africa is facing reduction of fish stocks, degradation of the environment and human population growth pressures that are having negative impacts on the rural economies and the life system of rural people. Artisanal fishermen are key actors in the management of coastal zones. As such they should be recognised as knowledgeable managers of the coastal resources (McNeely, 1996).'

The general framework depicted in Figure 2.1 is made more specific to the fishery in Chintopo. In Figure 2.2 needs external to the area emanating from neighboring countries, create a demand for fish from Chintopo. This market provides an opportunity for local people to meet their

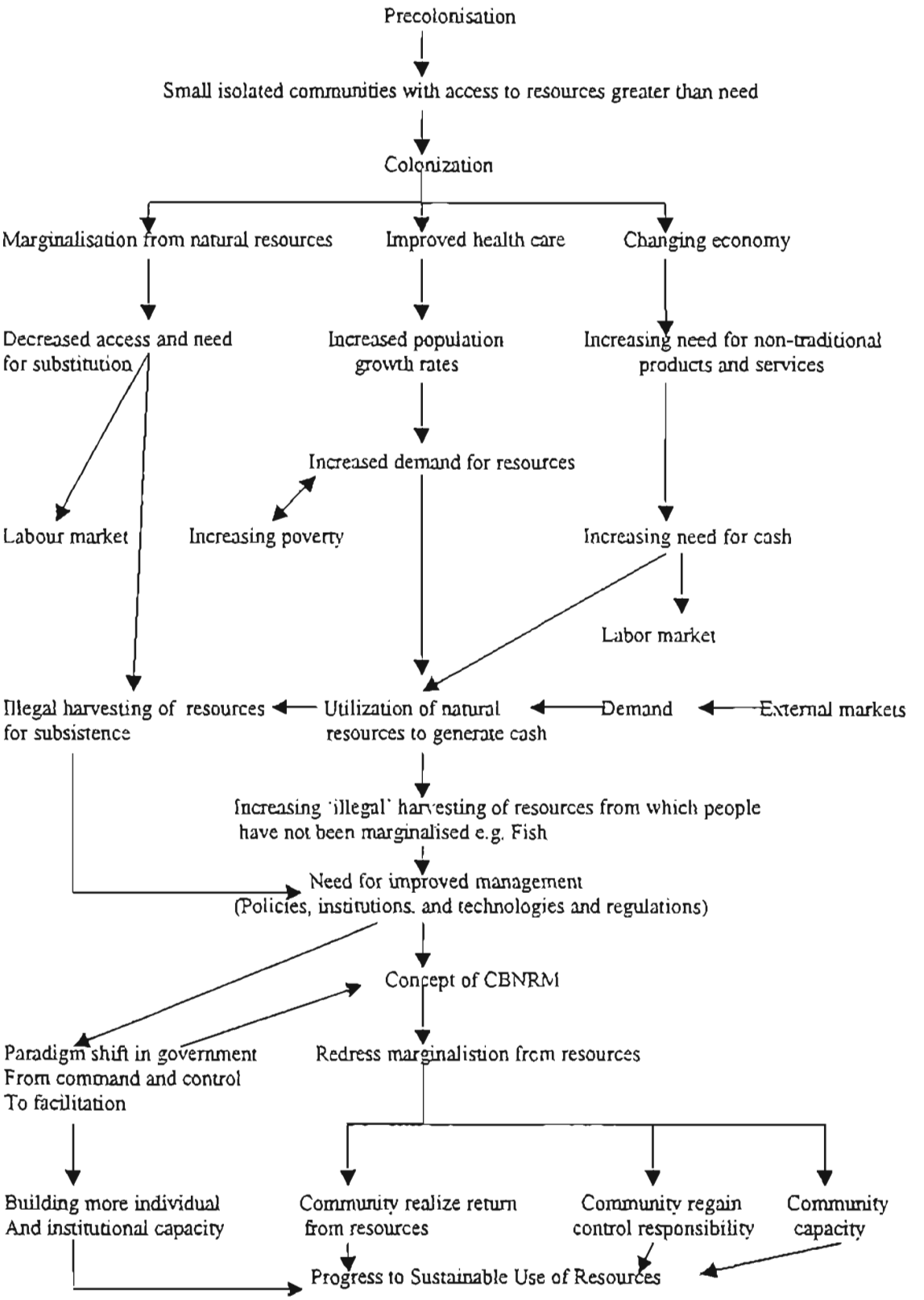

Figure-.2.1. A conceptual framework illustrating the forces and resulting changes in resource use and management. This framework provides context for understanding the origin of Community Based Natural Resources Management, and the need for intervention.

household needs such as cash, goods and services.

Household needs drives their demand for fish which in turn determines the harvest pressure and changes in technology and expertise. Harvest pressure determines the state of sustainability of the fishery. Households' needs are also driven by changes in the internal national economy.

Perception of the state of the fishery and the benefits which can accrue from it, direct government, at all levels, to establish policies and legislation which can regulate either or both the external market and/or the harvest pressure. This is typically achieved by restructuring exports and licensing fishermen and placing restrictions on when, where and how to fish (see Chapter 5 section 5.3).

2.3. The CBNRM Concept

Broad (1994) observed that some 'poor people act not as environmental degraders but as environmental sustainers' and goes on to say that ' some poor communities of indigenous people and other long-term residents of fragile eco-systems have served as laudatory and effective environmental managers and stewards'. The sense in this arguments is that there are peasants with secure land tenure who are environmental sustainers (Annis, 1992a and b in Broad, 1994). It has been the changed ' environment' in which these communities operate which has led to unsustainable practices (Breen *et. al* 1998; Murphree 1995; Steiner and Rehoy, 1995). Marginalisation of these people from using 'their' resources has altered perceptions about their relationships with this resources. Thus, ownership is considered central to the notion of reversing this trend. Ownership is defined as 'the placement with a person(or a group of people) of a certain group of rights to property: the right of possession, use of disposal of worth (Harper, 1974 in Murphree, 1995). Thus it is that CBNRM seeks to return ownership of natural resources (particularly wildlife) to local people so that they can realize its worth.

CBNRM is a process; it is not a project which has a beginning and an end (Cusworth and Franks 1993). Senge (1995) observed that ' it is relatively easy to get people to be interested in new ideas ' but ' sustaining the effort' is another matter. Essentially CBNRM must set out to build a learning

organization' in which there is no 'ultimate destination, only a lifelong journey' (Senge, 1995).

Typically the focus of Integrated Conservation and Development (ICDP) (Well and Brandon 1993, Brown and Wycoff-Baird 1992) and similar initiatives such as Communal Area Management Program for Indigenous Resources (CAMPFIRE S.U.S.G., 1994) and CBNRM (e.g. Tchuma Tchato, DNFFB 1993) has been on wildlife resources and the benefit communities can derive from them (Steiner and Rehoy 1995; Wells and Brandon 1993).

2.3.1. Causes of failure of Integrated community Development Programmes (ICDPs) to include:

- Top-down approaches to project implementation and failure to achieve local community participation at all levels of planning, implementation and management of ICDPs.
- Inability to provide short term and long term, tangible benefits to local communities.
- Lack of sustainable improvement to the social or economic situation of local communities.

2.3.2. Features of the more successful ICDPs were:

- Matching the needs of the local communities with resource use options.
- Improving living standards of local communities via the generating benefits directly from resource utilization.
- Decentralizing decision making structures, and involving community organizational structures in resource use planning and management.
- Production of sufficient revenues from resource utilization for the projects to be self-funding.
- Reduction of conflict between local people and protected area authorities and wildlife .
- Securing ownership and use rights of natural resources to local communities.

2.4. Principles of CBNRM

Steiner and Rehoy (1995) defined five principles which form the basis for CBNRM:

1. **Effective management of natural resources is best achieved by giving the resources a**

focused value- to determine whether the benefit of managing a resource exceeds the cost the resource must have as a measurable value to the community.

2. **Differential inputs must result in differential benefits**- those communities living with the resource and thus bearing a higher cost should receive higher benefits than those who do not bear this cost.

3. **There must be a positive correlation between the quality of management and the magnitude of derived benefits**- an incentive for good management must reward greater investment in the resource with greater benefits.

4. **The unit of proprietorship (ie. Who decides) should be the same as unit of production, management and benefits**- the group which manages the resources should also form the local management institution.

5. **The unit of proprietorship should be as small as practicable, within ecological and socio-political constraints**- small social groups are better at managing themselves and the resource than large anonymous institutions.

Dorm-Adzobu (1996) identified key principles for environmental management. These were derived from an analysis of the environmental strategies of Africa. They are relevant to this broader political and institutional context of resource management and development (Davion, 1996; Maughan Brown, 1998).

2.5. The six principles are:

1. **Institutional choices**- Establish a precedent and continuing basis for effective cross-sectorial coordination in managing the environment.

2. **Political support**- the support from political institutions is important for sustainable development. Governments need to be committed to strategic planning, comprehension of the

issues on the environment, allocation of resources for institutional development of political leadership so that a better environment is achieved.

3. **Donor support**- The role of the donors is important. They are in most cases known to be providers of good technical assistance, co-ordination of the activities, and imposition of conditionalities which lead to a successful environmental management.

4. **Local and sub-national participation**- Involvement of NGOs, indigenous institutions and concerned individuals in the planning process, is important. This emphasizes the need for a decentralization process.

5. **Capacity development**- This is the most important determinant of success in effective management of the environment.

6. **Implementation**- Environment management requires strategic planning. Central leading institutions have to be in place, facilitating institution building, co-ordination, training and facilitating adopting innovative approaches such as policy formulation instruments, monitoring and planning and implementation process.

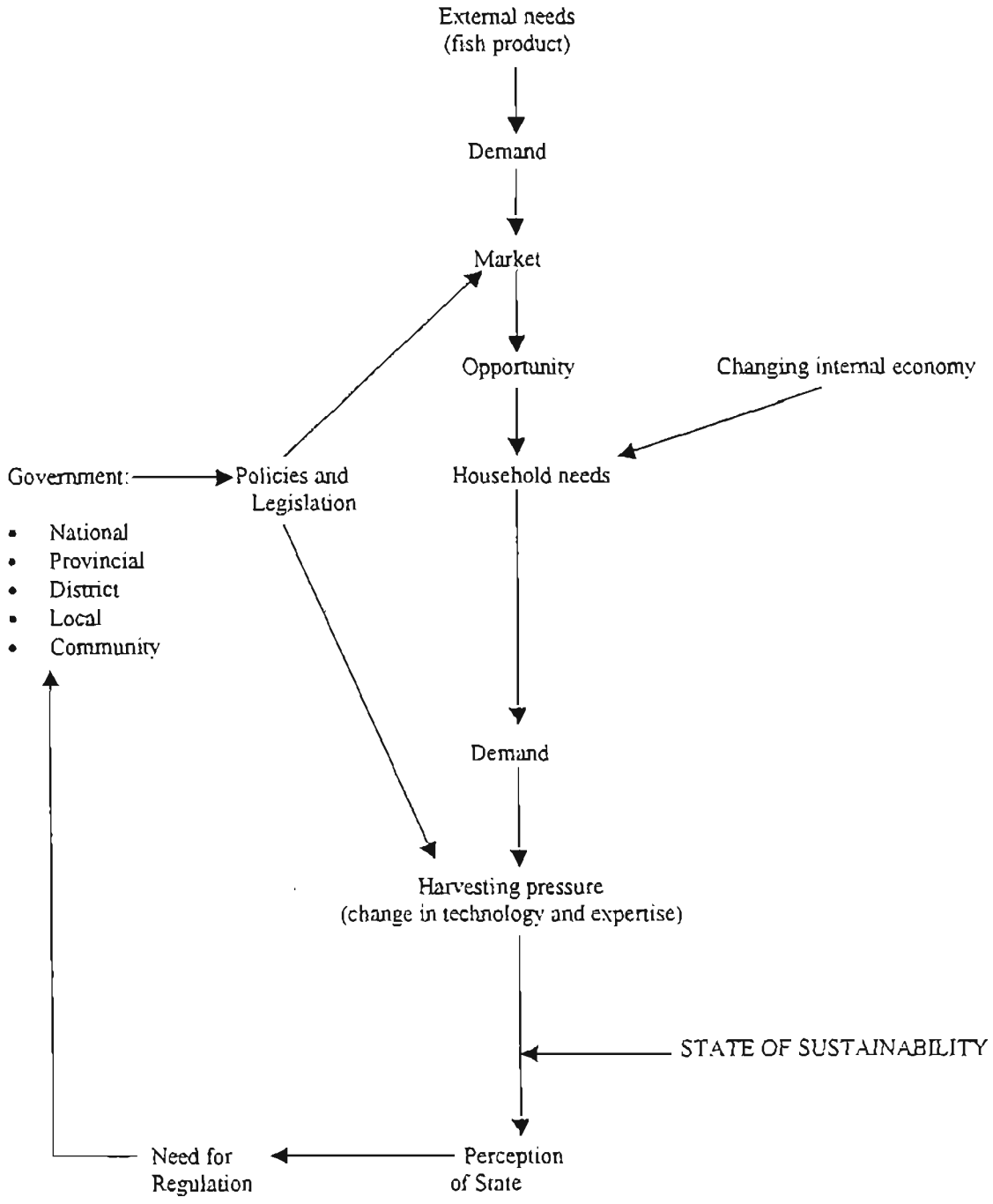

Figure-.2.2 The effects of demand external to the Chintopo area on harvest pressure by local fishermen and how this influenced regulation.

The overall intention of CBNRM is that people acting in community learn their lessons and structure their own skills in the maintenance of resources on common property (Western, 1993). Using these principles it is possible to derive a definition of CBNRM. It is a management strategy that seeks to manage natural resources with a view to utilizing one or more of the resources for economic returns. In theory, these revenues can be used to alleviate conditions of socio-economic impoverishment by developing infrastructure (schools, clinics, etc.) which serve a function of social development and by developing human capacity (Maughan Brown, 1998). Furthermore, it is also a process of involving local people in the process of change and development and enabling them to manage wisely the resources base (Bell, 1987; Murphree, 1993). A difficulty is that whilst most of CBNRM projects specify what they mean by local participation, most have treated local people as passive beneficiaries rather than as active collaborators (Wells and Brandon, 1993):

' Some of CBNRM initiatives found it necessary to generate short-term benefits to establish credibility, but such immediate gains are not a substitute for the time-consuming and intensive process of involving the communities in project design and implementation of the long term (Maughan Brown, 1998)'.

Therefore, achieving the balance between short and long-term goals is essential, as is balancing participation with enforcement activities (Cernea, 1985).

In the context of marginalised, poor rural people, the single most important principle for CBNRM is that these people are empowered to influence their destiny through access to and use of local natural resources. Some writers suggest that empowerment is not the outcome of a single event, but rather a continuous process that enables people to understand, upgrade and use their control and gain power over their own lives.

Who is to empower these people? It is simply not possible for marginalised, impoverished rural people to empower themselves. External intervention is necessary. Maughan Brown (1998) conceptualized the process as starting with high levels of involvement of people "external" to rural communities who, after a period of "self-organization" begin to empower the community. He envisaged that it might take a considerable time (7-10 years) to achieve a sufficient level of empowerment to enable external agents to reduce their involvement and support to "maintenance"

levels (Figure 2.3).

This conceptual model of the process is perhaps too simplistic. In developing countries it is probable that those who have to take responsibility for and have to be accountable for intervention for empowerment of rural people, are themselves ill equipped to intervene. Thus they, in turn, have to understand capacity building via some other external agents. This creates additional lead in time before the rural people are engaged (Figure 2.3). It will be obvious that if those who intervene to empower marginalized and impoverished rural people are inadequately informed and prepared and do not have the necessary skills and institutional support their success is improbable.

The need for a first phase of empowering those who will have the role of empowering rural people, and the lead in time for this, is inconsistent with the expectations donors and government have of quick delivery to the rural communities. The inadequate appreciation of the need for empowering empowerers before they engage rural targets and of the need for ensuring effective institutional support for them has been a significant factor in effectiveness of CBNRM initiatives. Murphree (1995) commenting on the success and failure of CBNRM in the southern Africa region, observed that 'we have placed policy and practice before politics and have thus encouraged the birth of CBNRM in its "modern vision" into a politico-legal environment which if not hostile, is hardly a nurturing one. He goes on to say " we have spent a lot of time and money in implementation on the ground, leaving the outcomes of the political battlefield which surrounds it largely unresolved" (Murphree, 1995).

2.6. Tchuma Tchato

The genesis of the Tchuma Tchato project illustrates these issues. A six month field study of the conservation status of an area of the southern shore of Cabora Bassa led the National Directorate of Forestry and Wildlife (DNFFB 1993) to propose enhancing the institutional capacity of DNFFB in respect of policy and legislative reform, and the implementation of CBNRM projects. The DNFFB stated that ' the most important activity that this program would undertake is the building of the capacity of the Wildlife Department to conserve and successfully implement community-based wildlife management programs that support improvement (sic) of rural lives'.

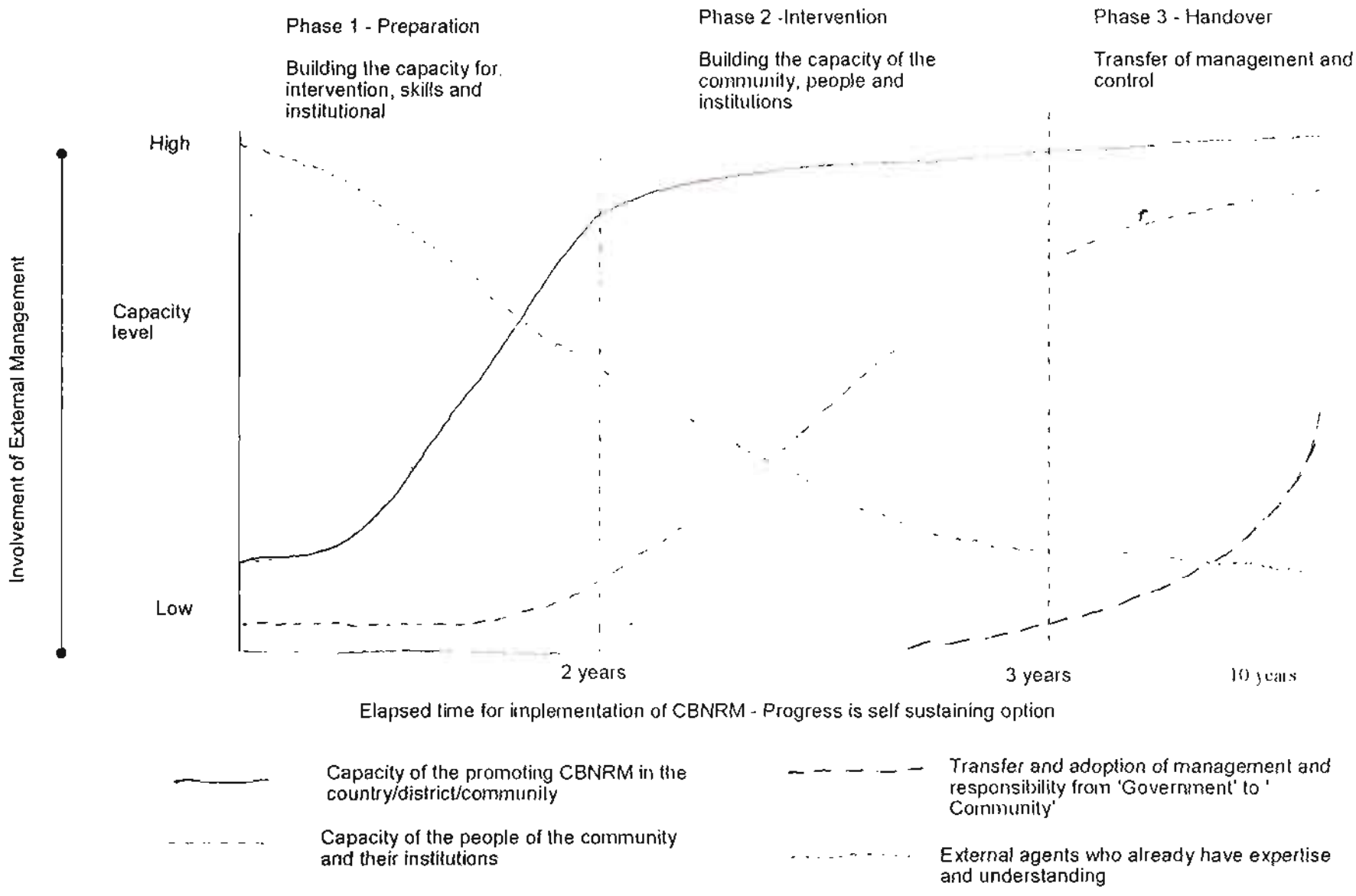

Figure 2.3: Intervention of international agents for promoting CBNRM in artisanal fishery

The DNFFB, however, considered it necessary to achieve this through implementation of a pilot-project in south western Tete province. It was envisaged that this project would ' be a key opportunity for the Wildlife Department to learn practically the challenges of introducing community based resource management (DNFFB 1993).'

Maughan Brown has drawn a distinction between a development project which is bounded in time, and development which is an open-ended process. The DNFFB secured funding from the Ford Foundation for a CBNRM project in south-western Tete province. Initial funding was for two years (1995 and 1996). It was subsequently extended for a further year and then again until the end of 1999 and further 2000. Thus, a site-based CBNRM project was initiated concurrently with a process of institutional capacity building. The obvious question is was DNFFB adequately prepared for establishment of the CBNRM project which came to be known as Tchuma Tchato. Maughan Brown has suggested that they were not. He concluded that '....the project is floundering' and that ' The primary cause is a weakness in the roles played by the lead institution and external agents'.

The problems currently being experienced by Tchuma Tchato are consistent with the analysis of Murphree (1995) and are predictable from the conceptual model (Figure-2) illustrating the need for a 'training of trainers' before engaging marginalised rural communities.

2.7. Fisheries and CBNRM

In African countries, particularly Zimbabwe (CAMPFIRE) and Zambia (ADMADE and LRDP), CBNRM developed out of concern for wildlife conservation and the need to reduce conflicts between protected areas and neighboring people. Since fish have never quite had the same profile as rhinos and elephants amongst conservation agencies, and fish do not threaten peoples livelihoods, they have not been a common motivation for CBNRM. There are, however, exceptions. These arise in situations when fish stocks inside or outside protected areas are threatened by exploitation, e.g. Lake Malawi (Kumchedwa ,1998; McCracken, 1987b); the Kosi Lake System (Kyle, 1994).

It is ironic that fisheries which have been so important in the lives of many rural communities (Welcomme, 1996), have not attracted more attention. If one considers the three requirements for achieving sustainability (Goodland, 1995) viz. social, economic and environmental sustainability, inland fisheries provide a unique opportunity for establishing CBNRM. In these societies fisheries are important elements for social, economic and environmental welfare. A level of understanding about resource management has been built up over many generations and external intervention would therefore be atop an established platform of empowered people. This contrasts markedly with the situation in other forms of wildlife where access to and management of use of the resources has been retained to varying degrees.

Colonization brought with it declines in mortality and the associated increase in life expectancy. The rate of population growth increased and, with changing economy came new requirements, for expenditure on health, food education etc. (Hulme and Turner, 1990); World bank (1992). The low levels of education amongst rural people make it difficult for the poor to move into new fields of employment (Bland, 1993). Under such marginalised circumstances these people become degraders of resources (Lewis, 1989; McNeely, 1985 and McNeely, 1994).

The people of Chintopo Ward which is included in the Tchuma Tchato project area have been using the fish resources of the Zambezi river for generations. The change and the implications of these changes are illustrated in Figure2.1 and 2.2. There have been two driving forces- the growth of the population and the changing socio-economy which drives people to harvest fish for sale. The ready market in neighboring countries (Zambia and Zimbabwe) provides incentives for the move from subsistence to commercial fishery and ultimately to a tendency to adopt new technologies, which enable one to increase sales into the market. In the absence of effective resource management the inevitable consequence is unsustainable use. This provides motivation for this research project.

2.8. Conceptual Framework (Figure 2.3)

The CBNRM conceptual framework (Figure 2.3.) and the evolution of the fishery to its current state in which there is growing concern for sustainability, indicate a need for external intervention.

Hara (1996) has argued that it is only a government institution which can intervene to promote economic efficiency, equity and effective administration under such circumstances. However, to accord with the principles of CBNRM the intention of intervention should be to empower local people to manage the fishing for sustainable use in the changed context in which they find themselves. Some researchers (1995) developed a framework for integrated water policy analysis. This pressure state framework can be modified to provide a model for the interaction between the state of a system (in this case the fishery); the perception people have of this state; the pressure which bring about the state; and policies and regulations which control pressure with the intention of achieving a preferred state (Figures 2.1 , 2.2. and 2.3).

This model elucidates a number of issues which have a fundamental bearing on the implementation of CBNRM:

- the perception people have (whether they are accurate or not) determines their actions,
- policies and regulations are likely to be effective only when they accord with perceptions about their need in respect of achieving or maintaining a preferred state,
- the starting point for engaging the community in management of the fishery (in this case) is to elucidate and understand their perceptions; and if necessary to determine how to change these so that policies and regulations are internalized as self-regulatory mechanisms to modify behavior, in order to achieve a state which accords with perceptions of how they would it like to be.

CHAPTER THREE

RESEARCH METHODS

3.1. Introduction

This research comprised four parts: developing a theoretical understanding and conceptual framework for the research based on an analysis of relevant literature; an investigation of the origin and organisational structure of the Tchuma Tchato Project so that the preparedness of those responsible for implementing the project ('the agent of change') could be assessed; a limited survey of local people to elucidate the importance of the fishery and how it was currently being integrated into the Tchuma Tchato project; and an assessment of strengths and weaknesses.

3.2. Literature review and data collection

The literature analysis focussed on the origins, principles and strengths and weakness of ICDP, ADMADE and CBNRM projects. It also set out to develop an understanding of the process of CBNRM and the roles of government and others as 'agents of change' in the process. It sought to conceptualise the fishery and the likely forces influencing it, and to establish a conceptual framework to guide the gathering and interpretation of information.

The origins of CBNRM in government were traced and the organizational structure was elucidated. Interviews with officials (key informants) at various levels helped elucidate the structure and the qualifications and experiences in relation to CBNRM. This enabled subjective assessment of how 'prepared' government was to act as the 'agent of change' as depicted in the conceptual framework developed from the literature review. This approach was repeated for non-governmental agencies and at the lowest level, for Tchuma Tchato (the project). Key informants have been defined as ' individuals who are likely to provide needed information, ideas, and insight on particular subjects (Kummer, 1978 b in Cellier, 1994:103).' Nichols (1991) has observed that key informants are most reliable on factual matters.

The method was chosen because it permits direct comparison of responses and the interviews experience is standardised. In this way reliability is enhanced (Cohen and Marion, 1994). Structured interviews are considered appropriate when literacy levels are low (Kitwood, 1977 in Cohen and Marion, 1994). They have however, also attempted criticism (Chamber 1983 ; Newmen, 1994).

The third component comprised a search through such records as were available from government offices and the Tchuma Tchato office to establish revenue generation and distribution. Local peoples' perceptions of the importance of the fishery in the local economy was established by way of structured interviews conducted with two samples. The first random sample of 30 people was drawn from residents of two villages, Bawa and Nhanjenje, situated near the river. This separated a group who, because of proximity to the river, might perceive the fishery differently from the people of Chintopo at large. The second random sample of fifty people was drawn from all six villages and some fishing camps (Tables 5.1 and 5.4). This sample provides a community- wide perspective of how access to fishery is regulated and who purchases fish.

The questionnaire follows in Appendix ii-iv. Unstructured, open ended interviews were held with key informants, particularly Spirit Mediums and Headmen. It was only possible in the time available to conduct a limited survey.

The approach and selection of informants from a range of sectors, government, traditional authority, Spirit Medium, and local people involved in the fishery facilitated cross checking for congruence.

Personal observation (Photos 2, 3, 4, 5, 6 and 7) also contributed to understanding and interpretation. It is probably impossible to totally elucidate personal bias when recording personal observation. This is particularly so since the researcher co-authored the report which led to the Tchuma Thato project (Namanha and Abacar 1993); and he has been associated with it continuously since then. Every attempt has been made to limit evidence from personal observations to those which help to substantiate other observations associated in more objective ways.

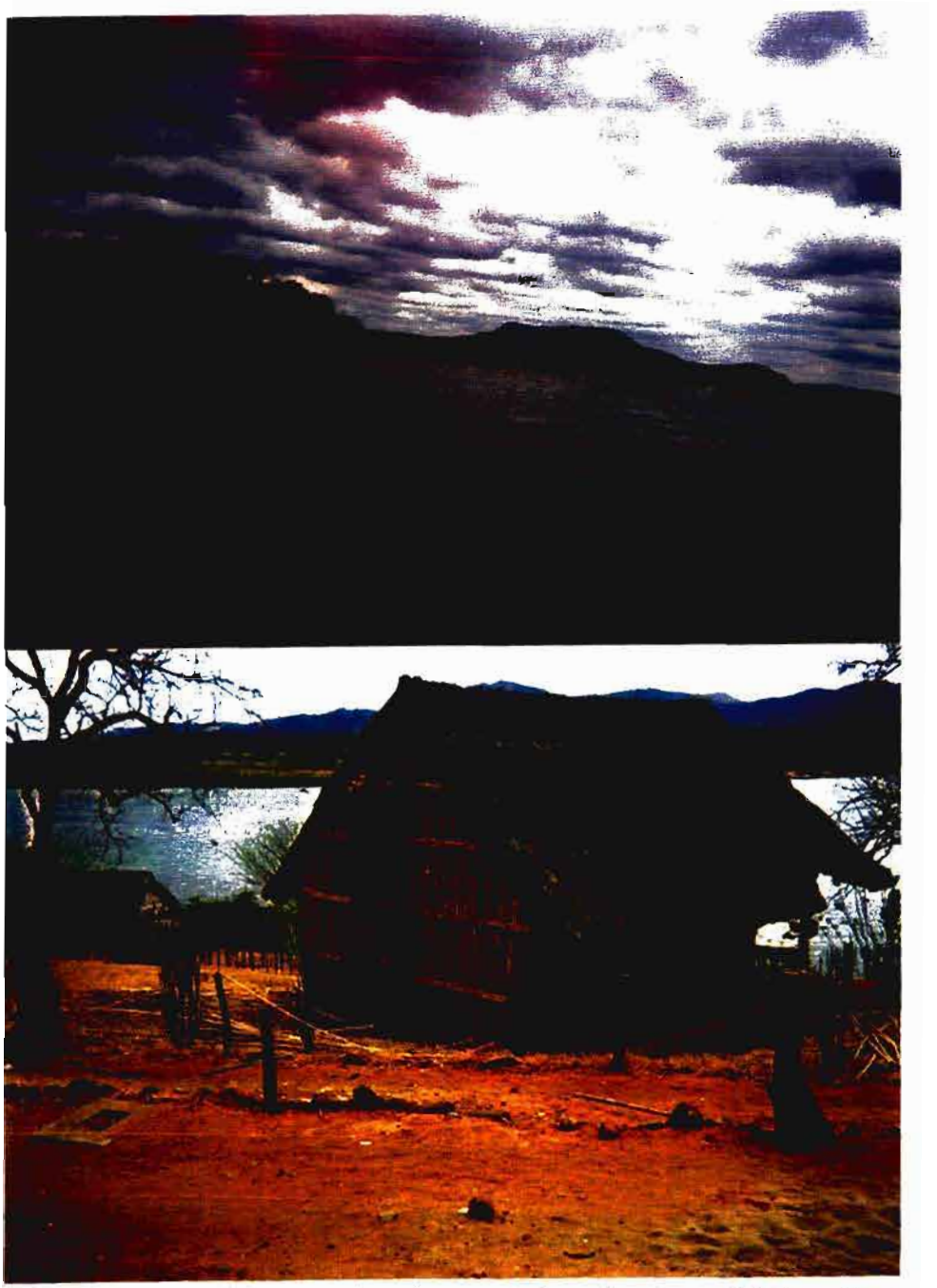

Photo 2. A view of the natural environment along the shore of Cabora Bassa. The photograph is taken in front of community tourist camp named 'Zungunukei' camp. Zungunukei in chikunda language refers to meeting point of the Zambezi and Luangwa rivers.

Photo 3. Zambezi river bank subsistence cultivation.

A synthesis of the findings in the context of the conceptual framework enabled assessment of the strengths and weaknesses of the CBNRM initiatives at Chintopo and the definition of recommendations.

Photo 4. Bawa council members counting money received from fishing licenses.

Photo 5. Bawa community purchased their grinding mill.

Photo 6. Fisherman above getting ready for night fishing.

Photo 7. Others already fishing.

CHAPTER FOUR

PREPAREDNESS FOR INTERVENTION

4.1 Introduction

It became clear in the review presented in Chapter 2 that the successful implementation of CBNRM is critically dependent on intervention. Since the DNFFB is the government agency promoting CBNRM it is their capacity, in human and financial terms, which will determine, at least in the short term, the success or failure of intervention. Because of the debilitated state of the economy of Mozambique and the fundamentally different approaches to development which are now being adopted by government, support from partners in both the public and private sectors is also an important determinant of success and failure.

In this chapter an attempt is made to assess how well prepared the government is for intervention, and how strong support from other agencies is.

4.2 Government

4.2.1 Policy

Whilst Mozambique was a Portuguese colony it imported most of its fish requirements from Angola, which was also a Portuguese colony. Local fisheries did, therefore, not receive the formal attention of government (Saluda, 1996 and pers. Comm. 1999). Fisheries developed autonomously with little or no control.

With independence came restrictions on the importation of fish from Angola. Attention focussed on local fisheries. The emphasis was, however, on marine and estuary fisheries. Inland fisheries continued largely uninfluenced by government. Companies, known as 'Equipesca' were established to exploit the fish and other marine resources, particularly prawns (Lopes, 1998 and Lopes pers. comm. 1999). The National Secretariat of Fisheries, set up by the socialist government, developed policies and regulations, but the focus was on control and harvesting.

Inspection was the regulatory system. There was no attempt to constitute an integrated management system for artisanal fisheries until 1998 (Appendix 1 para 12.2). The fisheries management plan known as 'Program de co-gestao das pescarias artisanais' (Lopes, 1998) focuses on improving the supply of fish to internal markets and improving quality of life. It is reasonable to envisage that in the absence of enforcement of sustainable harvest levels, this could lead to unsustainable harvesting of the resource.

The proposed management plan does, however, also state that the political and economic objectives of the government are to ensure conservation of fisheries whilst optimising the economic benefits. Social, other than economic (in a narrow sense) benefits, are not implicitly recognised. However, the policy directs towards co-management of fisheries, along the lines of CBNRM. This could secure the flow of social benefits associated with the fishery.

Co-management of fisheries is defined as the sharing of responsibilities, authority and competency between the government (fisheries research and administration) and the users of the resources (private sector and the communities) in the management and control of fisheries resources use and other aquatic resources (Plano Director, 1994; IDPPE, 1999).

According to IDPPE the objectives are:

- to conduct socio-economic research and implementation of biological base-data collection so that local communities will be enabled to manage fisheries resources based on local initiatives;

- to promote formation of artisanal fisheries co-management committees in the areas with indications of overfishing;

- to establish policy and legal framework for fisheries and institutions based on harmonising formal and informal fisheries i.e. establishment of fisheries co-management;

- to improve fisheries conflict management in fisheries resource areas;

- to improve communication between fisheries administrative institutions and researchers and communities using the fish resource in the fisheries areas (IDPPE, 1999).

For the implementation of the fisheries co-management programme, the National Directorate of Fisheries suggested the following immediate activities:

- to train and enhance capacity of government officers in fisheries resource evaluation and socio-economic research
- to enhance capacity and mobilise communities in resource evaluation and dialogues among communities and institutions
- to establish data-base collection system
- to establish functional co-management system.

The responsible authority for fisheries management declared in their 1999 seminar that, until the date that the master plan was established and published , fisheries management will be based only on a licensing system and prohibition of fishing modalities especially along the coastal zones (Lopes, pers. Comm., 1999). The emphasis on inland fisheries is not particularly strong. Preparation of fisheries management plans at present includes two components:

- socio-economic and biological research, and
- formation of 'local fisheries management committees' (Plano Director, 1994; IDPPE, 1999), which would be the day-to-day 'informers' or 'educators' of the communities on fisheries management and utilisation.

4.2.2 Organisation

It will have been evident from the review of CBNRM discussion (Chapter 2) that success depends on the partnership which is established between government and communities. This is so because government is the facilitator and regulator of resources use, via policies, regulations and policing, and local people are the users and *de facto* managers of use of natural resources.

Figure 4.1, depicts the organisational structure of government from national level to community

level. Government has established a Unit for Community Conservation of Natural Resources at National Directorate level. This signifies clearly the commitment of government to promotion of CBNRM. It has also established a Community Conservation of Natural Resources Unit at provincial level. At this level Wildlife and Forestry are established as separate sections. So too is Anti-poaching, which could have relevance for cross border use of fish resources. Fisheries is not recognised at this level . It operates at Provincial Service level.

One can anticipate the complexity inherent in achieving effective coordination, planning, communication and control. CBNRM does not, at least conceptually, apply to some resources eg wildlife and not to others for example forestry or fisheries. A high degree of commitment to collaboration is a prerequisite for success. This is because integration is complex and, therefore, does not occur naturally to any great degree. It has to be facilitated. The absence of formal recognition of CBNRM in the organisational structure at Provincial Directorate and Services levels potentially weakens communication and coordination between the National Unit and the Provincial Unit. This also might encourage the upper level and lower level to interact directly, short circuiting the system and thereby undermining attempts at coordination.

Reporting is also potentially problematic. The fisheries extension officers (Table 4.1) are appointed at provincial services level yet they may be required to be part of the lower level Community Conservation of Natural Resources Unit and may even operate at the project level . Coordination, planning and reporting is complex as authority and accountability are remotely located from the Provincial Unit which has responsibility for CBNRM. One can envisage much the same situation for Forestry when it is brought into CBNRM.

The organisational structure permits individuals to vary their commitment to an integrated approach to CBNRM. It permits them to avoid responsibility; and it enables them to escape accountability (personal observation). A result of this is that local people receive quite different, and often conflicting communications about the intentions and role of government in CBNRM. This weakens the relationship between the two primary parties in CBNRM, government and communities. It will also confound attempts to bring fisheries under the CBNRM initiative.

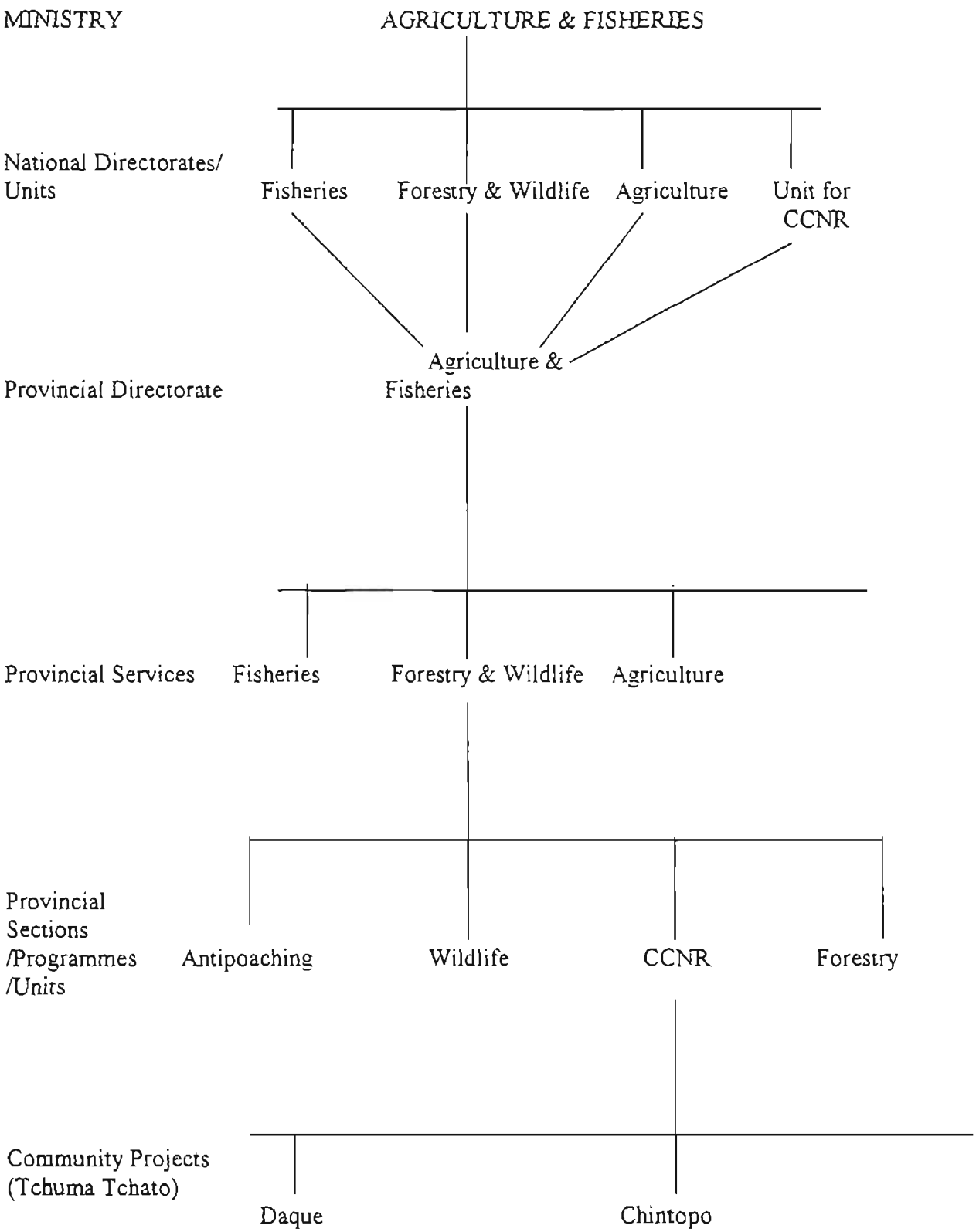

Figure-4.1. Organogram depicting the government organizational structure relevant to TT.

These observations suggest that it would be desirable to revise the structure and allocation of functions of government officials as this would promote greater unity, commitment and accountability. It would also promote a consistent approach which in return would engender the same from local people.

4.2.3 Human Resources

The government staff complement from Provincial level downwards, who are potentially available to engage one or more aspects of CBNRM, is illustrated in Table 4.1.

Also illustrated is the number of staff employed on CBNRM projects (Daque and Chintopo) who are paid from donor funds, particularly the Ford Foundation.

Table-4.1. The distribution of government and donor funded employees at provincial and project level in Tete Province. Casual laborers at Project level are not shown.

Key:

DPAP- Provincial Directorate of Agriculture and Fisheries.

DPICT- Provincial Directorate of Industry, Commerce and Tourism.

CCNR- Community Conservation of natural resources

SPFFB- Provincial services of forestry and wildlife

LEVELS	**SECTORS, DUTIES AND THE NUMBER OF PEOPLE TO EACH**	
1. Provincial services. Tete	**1. Fisheries (10)**	**2. Forestry & Wildlife (3)**
	. Chief warden (1)	. Chief warden (1)
	. Administrator (1)	. Administrator/Account (1)
	. Accountant (1)	. Senior scout (1)
	. Licensing (2)	
	. Inspection (2)	
	. Extension (2)	

2. Provincial Sections/Units/Programmes	**1. CCNR (3)** . Coordinator (1) . Admini/Account (1) . Tourism liaison officer DPAP/SPFFB/DPICT (1)	**2. Antipoaching (6)** . Senior scouts (6)
	3. Widlife (1) . Ranger (1)	**4. Forestry (1)** . Ranger (1)
All staff and laborers of community projects are donor funded		
3.Community Project (Tchuma Tchato)	**1. Daque Unit (12)** . Manager (1) . Admin/Account (1) . Scouts (10)	**2. Chintopo Unit(19)** . Manager (1) . Admin/Account (1) . Scouts (17)

It is noteworthy that no Tchuma Tchato (project level) staff are paid for by government. Also evident from Table 4.1 is that Extension Officers are appointed at the Provincial level of both Fisheries and Forestry and Wildlife Services. Whilst they may operate in the project areas, they are not seconded to Tchuma Tchato. A consequence is that they tend to fulfil their service level responsibilities independently and external to the Tchuma Tchato Project.

It is difficult to envisage interventions by government in their efforts to promote CBNRM being sustainable without their own staff at project level; and more specifically extension staff operating within and accountable to the Community Conservation of Natural Research section.

The vulnerability of the CBNRM initiative in Chintopo and Daque may be gauged from the grant sequence of the Ford Foundation. The first grant was for two years thereafter it was extended for two years and again for two years. How long will one funder continue to support the same initiative without entrenched dependency arising?

Another question which arises concerns the capacity of staff to promote CBNRM. It would be

appropriate to assume that staff at different levels have received the necessary training: that they are equipped for intervention. This is particularly so since Tchuma Tchato has been operational for five years.

The Mozambican government , and particularly the DNFFB envisages that it will be the "agent of change" promoting CBNRM. The need to develop the capacity to do this is acknowledged in the statement of intent made by DNFFB (Chapter 2, section 2.2 para 1).

Considering that Tchuma Tchato was the first and is the "flagship" CBNRM project, it is reasonable to assume that it would be the focus of the greatest government expertise in CBNRM.

Table 4.2. presents information on the qualification and experience of government personnel from provincial level downwards (i.e. those located near or at the project site) who could contribute conceptually and practically to the promotion of CBNRM. Four levels of exposure to CBNRM are considered: University degree; Diploma; Certificated courses; and practical experience. The assessment is current in the sense that it reflects the situation after five years of implementation of the Tchuma Tchato project. The table also includes information on project staff who are not government employees, albeit that they are paid by government from funds allocated to the project

Table-4.2. Information on the qualification and experience of staff (Provincial level and below) who would engage CBNRM in Tchuma Tchato Project.

LEVELS AND SECTORS	QUALIFICATION AND EXPERIENCE IN CBNRM
PROVINCIAL SERVICES: ***a) Fisheries:***	
• Manager/Chief Warden (10)	• No qualification • No experiencein CBNRM
• Licensing (2)	• No qualification • No experience in CBNRM
• Inspection (2)	• No qualification • No experience • in CBNRM

• Extension (2)	• Qualified • No experience in CBNRM
b) Forestry and Wildlife:	
• Chief warden (1)	• Forestry Degree • Post-graduate course in Wildlife Management(frequented) • No experience in CBNRM
• Senior Scout (1)	• Certificate in Veterinary • No experience in CBNRM
PROVINCIAL SECTIONS: *a) Antipoaching:*	
• Scouts (6)	• No training • No experience in CBNRM
b) Wildlife : • Rangers (1)	• Park experience • No experience in CBNRM
c) Community Conservation of Natural Resources: • Coordinator (1)	• Certificate in Wildlife Management • Diploma in Wildlife Management • Msc Degree in progress in Environment and Development • Anti-poaching training course • Short course on Participatory approach for conservation of the natural resources • A course on Public Relations, • Some experience to CBNRM(attended various seminars workshops and conferences) • No specific training in CBNRM
d) Forestry: • Ranger (1)	• No formal training • No experience in CBNRM
COMMUNITY PROJECTS: *a) Daque:*	
• Manger (1)	• Certificate in Wildlife Management • Diploma in Wildlife Management • Short course in Community Forestry Management • No experience in CBNRM

• Scouts (10)	• One under training in Certificate course in Wildlife Management • The rest no training • All no experience in CBNRM
b) Chintopo:	
• Manager (1)	• Forestry Degree • Short course in PRA • No training in CBNRM • No experience in CBNRM
• Scouts (17)	• Three trained at Certificate course in Wildlife Management • Others no training • Both no experience in CBNRM

by the Ford Foundation.

Evident from the analysis is that the level of capacity building during the five years duration of the project is very low. There is not one person with a professional qualifications which is substantially based on CBNRM. And only three staff have attended a CBNRM course lasting a month. Also evident is that staff with professional qualification have very little practical experience of CBNRM.

The intention of this research is to examine the prospects for bringing current fisheries practices and management into a CBNRM process. Evident above is a weakness in government in respect of their structure, organisation and capacity in CBNRM. But what about fisheries *per se*.

Organisationally fisheries loses distinction below the level of Provincial services. It is easy to envisage that similar problems will attend the incorporation of fisheries into Tchuma Tchato as appear to be the case with CBNRM. This is particularly so because examination of Table 4.1 reveals a dearth of qualification in fisheries management and fisheries science even at the Provincial level. Clearly a great deal of capacity building in both fisheries and CBNRM would be required to successfully incorporate fisheries into the broader CBNRM movement in accordance with government policy.

Although not the subject of this research it is also evident from Table 4.4 that not one member of

staff has training in tourism. Information in Table 4.3, shows that there has been capital investment in tourism. How can this be successful if there is no expertise to operate a tourism venture?

Progress in developing capacity has been poor. The result is a generally poor level of understanding, low levels of commitment and, consequently very little collaboration and integration. Staff still identify with their specialist areas of operation and not with the greater vision and process of CBNRM (personal observation). A much more dedicated approach to team building and capacity building is required if CBNRM is to become a culture (see Senge,1995) within the organisation. Only when this happens is government likely to be successful in its intention of being an "agent of change".

The NGO sector contribution will be shown (section 4.3) to be limited and unable to support DNFFB other than financially. The Ford Foundation has contributed to conceptual development of the project; to networking to promote capacity building, and to financing the initiative. The IUCN in Mozambique has neither the qualification nor experience to support the project except administratively; and there are no other NGOs active in the area.

Figure 2.3 (Chapter 2) indicates an hypothesis in which capacity building is a pre-requisite of engaging CBNRM. It is evident that there is no strategy to achieve this. This could become a 'fatal flaw' in achieving self reinforcing CBNRM in Mozambique. If projects such as Tchuma Tchato fail an important outcome must be that CBNRM becomes discredited among the authorities.

4.2.4. Logistics

The intention of CBNRM is to promote sustainable use of resources through the active participation of local people in managing the use of these resources. If government is to promote this, it must be enabled to engage continuously with rural people. It must also be able to network externally because CBNRM cannot, at least in the case of the fishery addressed in this research (Figure.4.1), operate in isolation. CBNRM in the Tchuma Tchato project envisages bringing tourists in from outside and selling fish to external markets. This cannot occur efficiently in the absence of external communication.

Information on logistical support for the project is presented in Table 4.3. There is no reference level against which to judge objectively the suitability of logistical support. At best some subjective and somewhat superficial remarks can be made.

There are currently three key commercial operations envisaged within the Tchuma Tchato project. One is the safari operation which functions almost totally independently of government and Tchuma Tchato. Tourism and Fisheries are 'imbedded' in CBNRM.

Tourism require high levels of marketing and communication. Managing the yield of fisheries to operate at suitable levels require strength in field operations including policing, monitoring and evaluation. The infrastructure supporting communication and travel does not accord with what would seem to be required to promote self reliance in the commercial operations.

4.2.5. Local people

Mozambique is one of the poorest countries in the world. Annual income in 1994 was only 88US Dollars per capita and two thirds of the population were living in 'absolute poverty', according to

Table 4.3. Logistics and facilities provided to different levels and sectors participating into CBNRM initiatives implementation in Tete Province.

LEVELS & SECTORS	LOGISTICS/FACILITIES
Provincial services of Fisheries	• furnished office, • one vehicle, • telephone and no fax mail, • two computer (one from TT institutional support to government organisms within DPAP), • no boats for management, • some books purchased by TT to fisheries services .

Provincial services of Forestry and Wildlife	• furnished office. • no office telephone line (now using the phone for Ttand fax mail. computer and email) • one car(operational) and others two non-operational. • one computer. •
Provincial section for Wildlife	• no appropriate office and furnishures. • no computer, • no telephone and fax mail, • no transport, • no uniform. • no learning or reading materials in the existing library, • no working facilities
Provincial section of Forestry	• no appropriate office and office furnishures. • no computer, • no telephone and fax mail. • no transport, • no uniform. • no learning facilities in the library, • no working facilities
Provincial section for Antipoaching	• no transport, • no working facilities(e.g. uniforms, etc.), • No appropriate office, no telephone and fax mail facilities.
Provincial section/unit for Community Conservation of Natural Resources	• Two computers • Telephone, fax mail and e-mail plus Internet • One vehicle • Furnished office • Has got some reading material section in the library for DPAP

Community Project(TT) Daque	• One vehicle • Two moto-bikes • 10 bicycles for the scouts • One speed boat • Generator • No water pump • One residential house for the manager • Visitors camp with three chalets • A radio communication system • No office(still under construction) • One computer • Scouts with uniforms
Community Project(TT) Chintopo	• Two vehicles(one not operational) • One computer with a satellite phone, fax and e-mail plus Internet • One moto-bike • 10 bicycles • Scouts with uniform • A speed boat • Water pump and canalized • Two generators • Tourist camp with seven chalets and two toilets (Photo 2) • One office block with five office rooms • A radio communication system

the World Bank (Maughan Brown, 1998). Illiteracy has been estimated to be 70% (Africa Watch, 1992).

Local people interviewed in the study indicated very low levels of education. Thirty respondents indicated they had primary school education (4 years of schooling). None had progressed beyond this . They are also very isolated from worldly influences from which they can learn by knowledge diffusion. Whilst this survey is not comprehensive it provides evidence to substantiate a view that the rural people whom government wishes to engage in CBNRM are poorly prepared to respond. This suggests that, in addition to knowledge and expertise in CBNRM and the particular resource (e.g. fishery) which is to be brought into CBNRM, the government officials should also be skilled in techniques such as Participatory Rural Appraisal-PRA- (Nabasa, 1995). Only one of the people indicated in Table 4.1, namely the manager of Chintopo, has completed a course in Public Rural

Appraisal (PRA).

4.3. Non-governmental Agencies

Three non-governmental agencies have directly influenced natural resources management in Chintopo since the cessation of civil war. One , the IUCN based in Maputo, is internal and two others are based outside Mozambique. These are the Ford Foundation which has been the dominant funder of Tchuma Tchato for five years, and Piet Hougaard, from Zimbabwe, who operates hunting safaris in the area of Chintopo Ward. The IUCN is the country manager of the funds allocated to Tchuma Tchato by the Ford Foundation. Hougaard does not play an active role in promoting CBNRM. The communities benefit by way of levies and products (meat).

The IUCN staff complement in Mozambique is small. There is no professional capacity in CBNRM.. This has in the past been drawn from the regional IUCN office in Harare. Mr. Mike Murphree was seconded from IUCN ROSA to the DNFFB in 1994 and in 1995 he transferred to initiate Tchuma Tchato. His contract ended in 1995. The author , who at that time, had partial training in CBNRM, whilst doing a Diploma in Wildlife Management at Mweka Collage, Tanzania, took over. Therefore there were periodic visits by people with experience of CBNRM from IUCN ROSA. A position for someone experienced in CBNRM has not been established at the IUCN in Mozambique. This weakens their potential for promotion of CBNRM..

One can reasonably conclude that there is very little expertise in CBNRM which is available to Tchuma Tchato from non-governmental agencies in Mozambique, with which it is associated. Since Tchuma Tchato is the "flagship" CBNRM project it is reasonable to assume that there is little expertise in the country. Whether the Ford Foundation does or does not have expertise in CBNRM is largely irrelevant since they are not required to intervene and should probably not do so.

4.4. Tchuma Tchato

The organisational structure and allocation of staff within Tchuma Tchato is shown in Figure 4.2.

If Tchuma Tchato was a community-based project one could reasonably expect that project appointments would be made by the community or at least by the community in association with government. This is not so. Only the game scouts are appointed by the communities by way of their Village Natural Resources Management Councils. The more senior positions in the project are government appointees. All positions in the project, including the game scouts are donor funded. The organisational structure has a distinctly top down character. Joint ventures between community and government are not immediately evident.

Tchuma Tchato means 'our wealth'. The intention is that local people should, in a sustainable way, realise the potential wealth of their natural resources. The conceptual framework presented in Chapter 2 indicates that for government to be an 'agent of change' it has to promote capacity building in the community, built on a sense of ownership and stewardship. One might expect joint appointments - partnership, in each of the sections. Also, one might expect to see more emphasis on business development and capacity development. Instead there is considerable emphasis on control by way of game scouts and the antipoaching initiative. The tourism position is not filled, yet a relatively large number of staff in administration have to service maintenance of the tourism infrastructure.

The project has been operational for five years. It would be expected that during this period there would have been strong emphasis on capacity building as indicated in the conceptual framework (Figure 2.3). Table 4.4 presents information on the qualifications of the incumbents and their exposure to CBNRM. Since CBNRM has much to do with improving the quality of life of rural people through wealth creation, comment is also included on training in business development.

The Manager and the Fisheries Chief Officer have professional qualifications in natural resources, forestry and agronomy, neither of which are particularly relevant to the CBNRM initiative currently underway. There is not one person from the Manager downwards who has received training in CBNRM prior to the start of TT, the only person who has received training in CBNRM during the five years of this project has been transferred by government. Not one person has received training in business development, or fisheries management and the person who had tourism training has been relocated by government to Tete. This emphasises the top down

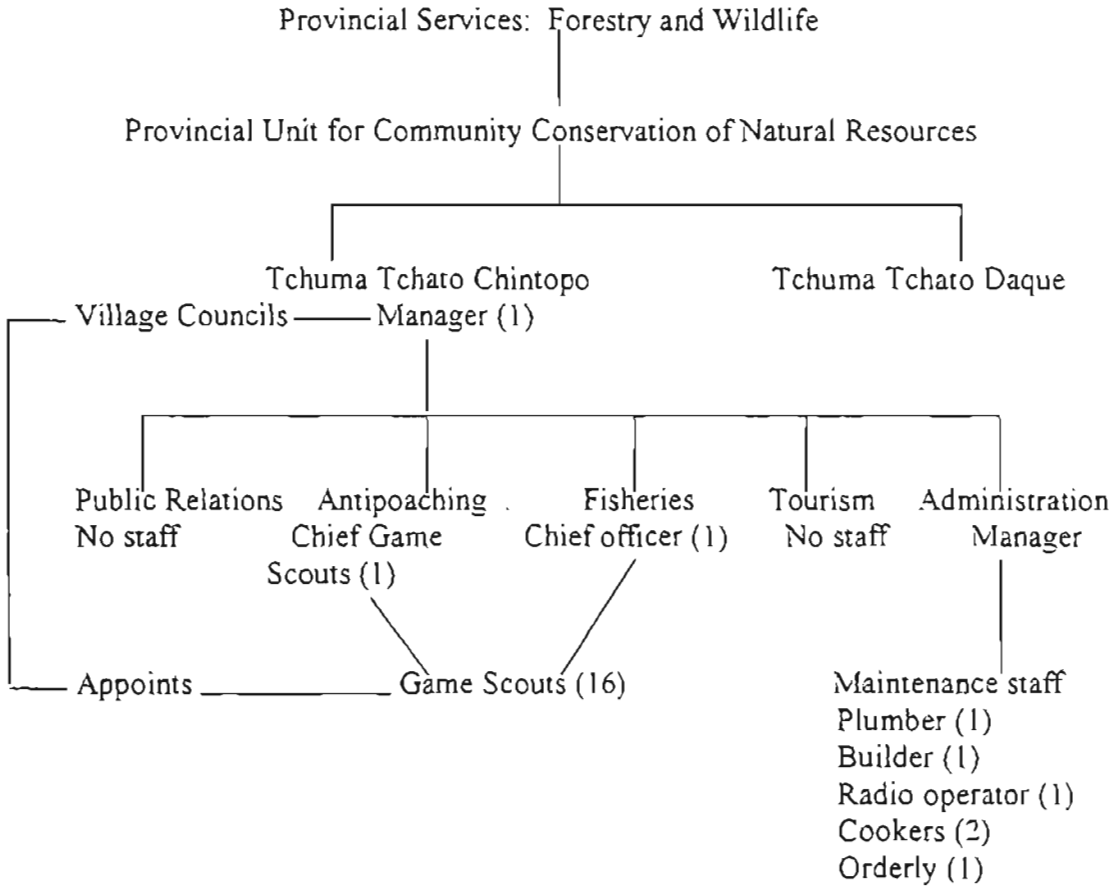

Figure 4.2. Organogram of Tchuma Tchato Project. All positions from Tchuma Tchato Chintopo Manager downwards are employed on donor agency funds. The Public Relations position has never been filled; The post of Manager Tourism, which included Planning was filled from December 1995 until December 1997. It is currently vacant.

approach of government, especially as this is funded by a donor.

Of the management staff only the Manager has visited other CBNRM projects. He was accompanied by two members of the community.

Six people from the Natural Reource Management Council visited the Masoka CAMPFIRE project for two days. One group from Masoka Zimbabwe visited Chintopo. No members of the community has received any training relevant to CBNRM, wildlife management, fisheries management or tourism. A ten days course was provided in Bawa for council members in order to improve accounting and financial management.

Based on this information it is reasonable to conclude that, even after five years of operation, the project staff and the community are not well prepared for adoption and implementation of community based natural resource management.

Table 4.4. Position, training and experience within Tchuma Tchato(TT) at Chintopo.

POSITION	TRAINING & EXPERIENCE
Manager	Degree in Forestry
	No training in CBNRM
	Short course in PRA
	No training in business development
	Visited CBNRM projects in Zimbabwe, Zambia, Botswana and Namibia
Public Relations	Post not filled
Anti poaching: Chief Game scout	Certificate in Wildlife Management
	No training in CBNRM
	No training in business development
	No visits to other projects
Fisheries: Chief officer	Certificate in Agronomy
	No training in CBNRM
	No training business development
	No visits to other projects
Tourism: Manager and Planner	Post not currently filled
	Previous incumbent
	Advanced - Diploma in Tourism
	Short informal courses in CBNRM (before TT)
Administration: Chief administrator	No training
	No training in CBNRM
	No training in business development
	No visits to other CBNRM
Village Councils: about 44 people in 6 Village Councils	No training in CBNRM
	20 people attended short course in accounts and financial management
	6 people visited (3 days) CAMPFIRE at Masoka (Zimbabwe)

	6 visited other CBNRM (in Zambia. Botswana and Namibia
	One visit (3days) of about 8 people from Masoka to Chintopo

4.5. Conclusion

The inescapable conclusion is that government is not adequately prepared to act as the 'agent of change'. This inadequacy is indicated strongly when one considers the isolation and low levels of education of the people of Chintopo.

It appears as if the primary intention of DNFFB, namely to develop its capacity, has received less attention than 'on the ground' development, including capital works.

This is consistent with the evolution of some projects elsewhere (Maughan Brown, 1998; Steiner and Rehoy, 1995) and accords with the analysis of Murphree (1995). It does not, however, accord well with the conceptual framework (Figure 2.3, Chapter 2) and the hypothesis of this thesis. Unless considerably more resources and effort are directed towards building multi disciplinary capacity in government it is difficult to envisage Tchuma Tchato being successful. It is also not surprising that Maughan Brown considered that Tchuma Tchato was 'floundering'! If CBNRM does not become internalised within the culture (Senge, 1995) of government attempts to transform the fishery will be difficult at best, and will fail at worst. The next Chapter seeks to establish what is currently happening in the fishery.

CHAPTER- FIVE

THE FISHERY

5.1. Introduction

Just as the effective implementation of CBNRM depends on the preparedness of government to act as an 'agent of change', so too does it depend on how ready the community is for change. The perceptions local people have of the resource use system and the distribution of costs and benefits determines how receptive they might be to suggestions for change.

This Chapter address three issues: the importance of the fishery to local people; regulation of access to the fishery and distribution of benefits. The rationale for this structure stems from the conceptual framework developed in Chapter 2 (Figures 2.1 and 2.2). The hypothesis is that a growing external market in neighbouring countries creates an opportunity for local people to engage an economy whereby they can satisfy their household needs. The opportunity results in increased effort which perceives traditional controls and leads to a change from a common property resource management system to an open access system. Prospects for introducing (reintroducing) CBNRM would be enhanced if there was meaningful distribution of revenues accruing from controls such as licensing and inspection.

5.2. Importance

Before attempting to establish the view local people have of access to the fishery it was necessary to obtain some idea of the role of the fishery in their lives. People from separate households thirty from two villages (Bawa 13 and Nhanjenje 17) were interviewed (Photos 8, 9, 10, 11, 12 and 13).

All respondents confirmed that their household engages in fishing, 22 said the household/ head of household fished and 6 said the wife fished. Only two respondents said that children fished. When asked how they meet their household needs all responded that they did this by fishing. 29 confirmed that cash for household needs was obtained from selling fish and one said that this was

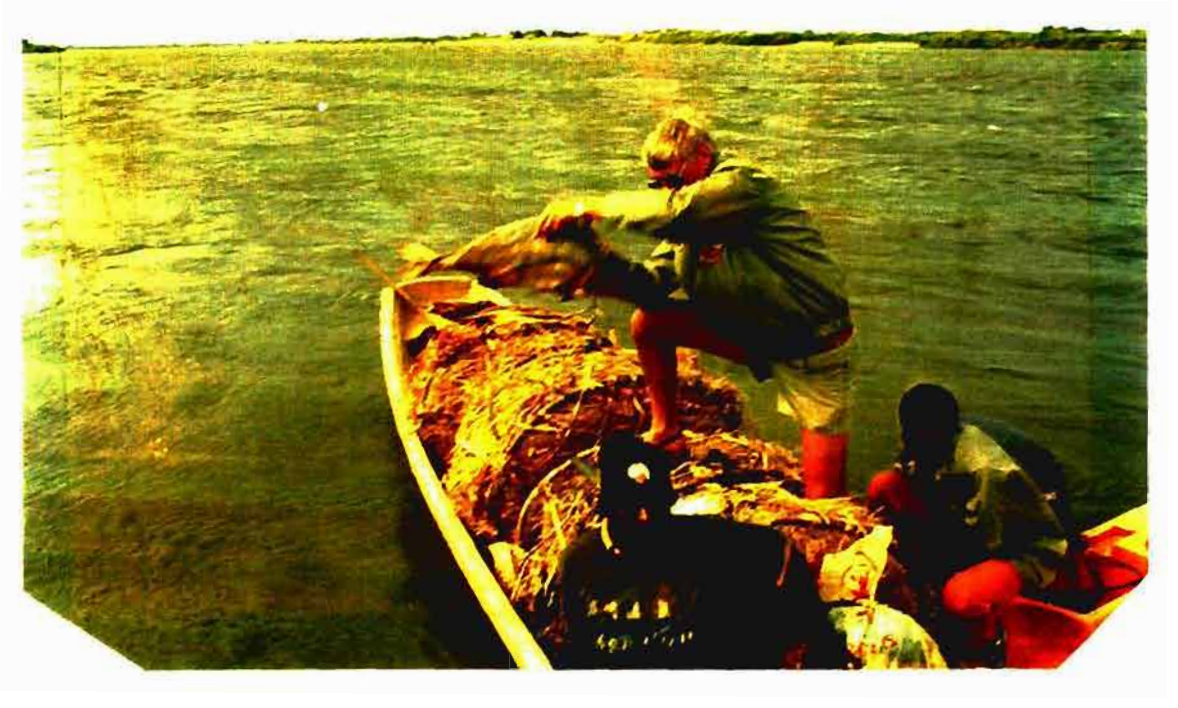

Photo 8. External demand for fish attracts traders from neighbouring countries. The visitor admires the size of tiger caught through artisanal fishing methods.

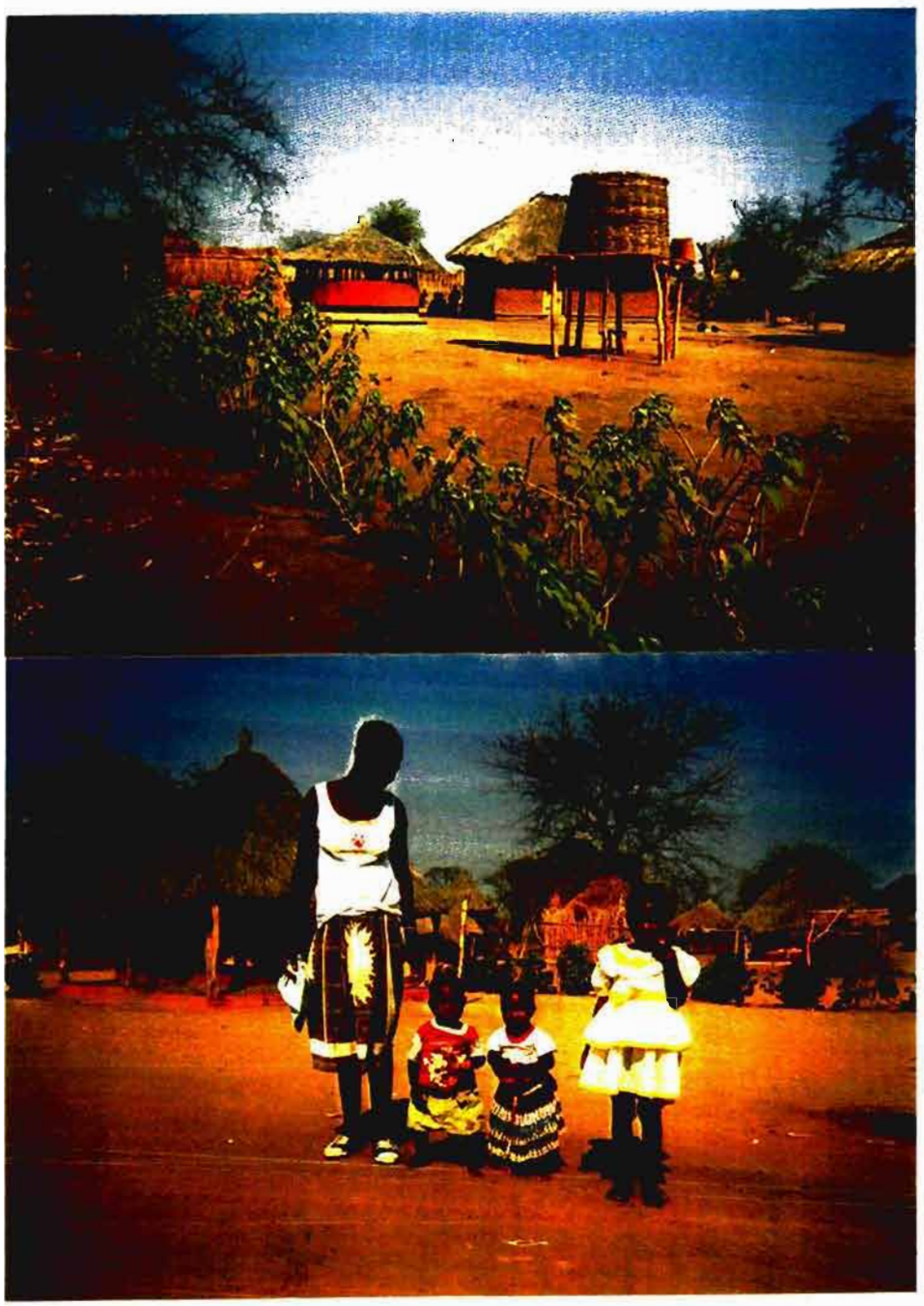

Photo 9. Households practising artisanal fishing are able to improve their living conditions. This woman and her children are all well dressed and home smart due to income from selling fish.

also derived from sale of other products from farming.

Responding to the question How important do you rate fish as a means of meeting household requirements? all said it was very important . On further enquiring 19 said fishing was a full time activity; 11 said it was a part time activity. All respondents said their households eat fish and that it was their most important source of protein. They all said that their household sold fish and 29 said they did this frequently. One respondent claimed to sell fish regularly.

Selling fish was not the only form of trade. All respondents said they also bartered fish and stated that bartering for household goods (maize, cloths and hard goods) was very important.

Respondents were also questioned on their involvement in farming. This was done to cross check their responses to questions about fishing, and also to establish the relative importance of fishing and farming in the local economy.

When asked if they produced all their household food needs by farming they said this was not so. All confirmed that their households engaged in farming. 28 said this was carried out by the wife (women) and only 2 said the head of the household engaged farming. When questioned on the relative importance of fishing and farming in the household economy, 26 responded that fishing was most important, and 4 said they were equally important.

This preliminary survey indicates that in the villages of Bawa and Nhanjenje fishing is a very important factor in their local economy. As such, it provides a good opportunity for engaging CBNRM.. This importance could make change threatening, particularly if it is perceived to negatively affect access to the stream of benefits from use of the fish resource.

Photo 10. People of Chintopo are continuously building new houses. This improvement happens where households engage in fishing.

Photo 11. Household heads returning from shopping using proceeds of fish sale. One purchased a bicycle the other a radio. These items have wide significance in communication both within and external to the village.

5.3. Access to the fishery

5.3.1. Access

Spirit Mediums were powerful influences in community affairs in pre-colonial times (Meque, Millioni, Mafiosi and Lekeliwe, pers. comm. 1998) although this persists even today, their influence has been greatly weakened.

In Chikunda society there are Spirit Mediums for various resources. In Bawa village the Spirit Medium for fish is Lekeliwe. She is regarded by local people as being 'possessed' by the Spirit Medium of fish *"Nsunguni"*. She was approached with a view to developing an understanding of how the fishery was managed in earlier times. The interview with Lekeliwe was unstructured and open-ended. Her interpretations were, however, checked by interjecting appropriate questions when discussing the fishery with other people in the village.

In earlier times the Spirit Medium held considerable influence over who fished and when they fished. Local people recollect that they would approach the Spirit Medium to seek protection whilst fishing, and for advice on where, when and how to fish. The Spirit Medium's influence was strengthened by the relationship with tribal authorities via headmen and the Chief.

Lekeliwe who is about 70 years old, now comments that she does not command the respect she used to. She claims people cross the river in places where it was previously forbidden; and the influence of people from outside of the tribe who now either fish or trade in fish, have contributed to the weakening of her influence. She claims that "' *Nsunguni*" a mythical fish with a human head has now left the area and resides in Lake Kariba. The Village Headman Meque (about 48 years old) and Millioni (about 55 years old) who has recently replaced Meque, confirmed both the declining respect for the Spirit Medium and the role of 'foreigners' in this process.

Mr. Mafiosi (about 65 years old) who is possessed with the Spirit Medium of elephants *Nsow*, and Mrs. Mariana who is possessed with the Spirit Medium of monkey *"Kolo"* also confirmed their declining influence.

These observations indicate that there were controls over the fishery and other natural resources As the Spirit Medium acted for the community, the fishery could be described as being a community-based fishery management system.

The fishery policy of government enables foreigners to purchase fish but not to fish. During this study fifty people were interviewed and the views of a number of others were accessed through unstructured interactions at gathering places. Local people claim that Zambians do fish, especially in the Kankanguru area which is fifty miles away from Bawa. Authorities are not able to police such remote areas. I did not come across a single instance of a Zambian fishing in the study area. It would seem therefore, that at the present it is the direct and indirect influence of the buyers which moulds peoples perceptions and behaviour. This is supported by Lekeliwe who claims that it is this rapidly growing demand for fish by foreigners, particularly Zambians, that has directed changes. She says that when fishing was for subsistence and markets were smaller, people had time to approach her before fishing. Nowadays fishing is a continuous activity, driven by external markets. The survey reported in section 5.2 confirms this.

The views expressed by the Spirit Mediums and headmen were checked posing their question, relating to access, to people from throughout the Chintopo area. The distribution is shown in Table 5.1. Some of these sites are fishing camps and others are villages. Together they reflect the broad spectrum of society in the Chintopo area.

Table 5.1. location and numbers of interviews for regulation of fishing.

NAME		NUMBER OF INTERVIEWS
Bawa	Village	15
Capessa	Village	2
Chintopo sede	Village	3
Chitete	Village	8
Kafukudzi	Fishing camp	1
Kayembwa	Fishing camp	1
Lissico	Fishing camp	4
Mamwira	Village	2

Mphanyame	Fishing camp	4
Ntondo	Fishing camp	2
Nyamulo.	Fishing camp	2
Nyan jenje	Village	5
Shonko	Fishing camp	1
Total		*50*

The results of the interview are presented in Table 5.2. The majority of those interviewed (70%) claimed that rights to fish were allocated informally and 96% stated Tchuma Tchato regulated the fishery.

Most (70%) saw local government as being responsible for establishing the regulations. This suggests that most people have a right to fish and that they can access it should they wish to. Only 4% still held the view that tribal and traditional authority had a role to play. This supports the views of the Spirit Mediums that their influence has waned.

Tchuma Tchato is obliged to issue a licence to any citizen of Mozambique should they be able to afford it. Thus, in a sense, there is open access. In reality however, the Tchuma Tchato approach may be restricting access of the poorest to commercial opportunities offered by the foreign market. In this sense access is not open. The important point, however, is that licences do not serve to regulate access. Rather they are a tax on fishing. Since they do not regulate harvesting they contribute little to resource protection, although this is claimed to be the intention. It will be shown later, because of the cost of the licence and the ways in which revenues are distributed, the process constitutes little support to Tchuma Tchato. For this reason there was also little to be gained by asking the respondents about the distribution of revenues from licence fees.

The entrenchment of Tchuma Tchato as the regulator (96%) was not surprising because licences are issued through their Offices, and the project employs game scouts, some of whom are engaged in patrolling the river, monitoring licences and arresting defaulters. Fines are also paid to the project.

Table 5.2. Responses to questions relating to regulations of the fishery. No responses are not shown.

QUESTIONS	TCHUMA TCHATO	LOCAL AUTHORITY	TRIBAL/TRADITIONAL AUTHORITY	INFORMAL
Who allocates rights	4	6	2	35
Who regulates fishing	48	0	1	0
Who establishes regulations	4	35	4*	6

* Respondents indicated that both local authority and Tribal/Traditional authorities established regulations.

Since its establishment the Tchuma Tchato project has also tried to devise and implement restrictions on the fishery. This was a response to the concern of Tchuma Tchato Management and of the Village/Local Natural Resources Management Councils who jointly perceived the increased and uncontrolled fishery as potentially unsustainable.

They established a policy which states that:

- fishermen are required to have a valid licence
- fishing areas will be designated to ensure that breeding areas are protected, and conflict between subsistence, commercial and sport fishing will be minimized
- minimum net mesh size will be stipulated (currently 3 inches)
- only Mozambique nationals are permitted to engage in subsistence and commercial fishing.

These are being implemented and transgressors are fined. There is, however, some doubt about the legality of these regulations, and the ability of Tchuma Tchato to implement them consistently. Government has not, as yet, devolved authority which permits communities to zone areas and regulate use in this way (Fermino, pers. comm. 1998).

5.3.2. Licensing and Marketing

Government has attempted to regulate both fishing and marketing. It does this by way of licences and inspection.

Table 5.3, presents information on licensing for fishing and purchasing of fish. The record is short because of the limited time since cessation of civil war and introduction of licensing. Only tentative interpretation can be made. Noteworthy is the large number of buyers in 1998, 323 compared with 207 in 1997 and 258 in 1996. People from the villages were asked to indicate the country of origin of those who purchase fish from fishermen. The information presented in Table 5.4, shows that foreigners are predominant amongst buyers, the country of origin of the buyers is largely determined by the proximity of the neighbouring country to the particular village; and there is very little internal market, probably because all residents can fish for subsistence if they wish to.

Table 5.3. The number of licensed fishermen and buyers based on information from A.J. Sequela, Tchuma Tchato Project, Chintopo Ward.

YEAR	FISHERMEN LICENSED	FISH BUYERS LICENSED
1996	150	258
1997	146	207
1998	170	323

Table 5.4. Country of origin of fish buyers as perceived by residents of different villages in the study area. Also indicated is the proximity in kilometres(km) of the villages (the market place) to the immigration border post with the neighbouring countries. Zambia (Zam), Zimbabwe (Zim), Mozambique (Moz) (Photo 8).

Village	Number of interviewed people	Country of origin of fish buyers and proximity to village (km)					
		Moz	km	Zam	km	Zim	km
Bawa	10	2	-	8	0.5	0	60
Lissico	8	1	-	7	30	0	50
Mphanhame	8	0	-	8	35	0	50
Nyanjenje	6	0	-	1	40	5	45
Chintopo sede	5	0	-	0	32	5	20
Chitete	6	0	-	0	52	6	0.5
Mamwira	3	0	-	0	60	3	10
Capessa	4	0	-	0	65	4	0.5
Total	50	3		24		23	

When asked why Mozambique people do not market their fish themselves in Zambia and Zimbabwe their reasons were given: They cannot do both, catch the fish and market them; and whilst the Mozambique government has made it easy for foreigners to enter Mozambique to purchase fish, residents of Mozambique have difficulties getting visas and when they do, travel is restricted so that they cannot get to the markets. The third reason is that being poor, they have difficulty in accessing sufficient funds to meet the costs of visas, transport, trade documentation and accommodation whilst out of the country. It is probable since they do not know and understand the markets in neighbouring countries, that they would experience problems in accessing the markets.

The civil war did not impact directly to any great degree on the people of Chintopo. But, the indirect influences of the absence of government and the declining respect shown traditional beliefs and government has been an important determinant of behaviour (Waterhouse, 1996). Under the conditions which prevailed there was little, if any, control over the fishery (Zambia News, 1997). People became used to 'open access'. Consequently, as government influence became felt after the war, not all people conformed. The penalty imposed for fishing or purchasing fish without the appropriate licence includes confiscation of equipment and a fine. The fine is twice the licence fee and once this is paid the equipment is returned to the owner. The extent to which this has occurred

between 1996 and 1998 is shown in Table 5.4 below.

Table 5.5. Individuals operating without the required licence who were apprehended by game scouts. Equipment confiscated is also shown. Fish confiscated is distributed to needy people and institutions.

Categories	Numbers		
Fishing Nets	Local	Foreigner	Total
Banana boats	36	17	53
Fish buyers	Non	6	6
Dugout canoes	13	9	22
Fish buyers	Non	18	18
Fishermen	27	32	59
Fish	More than 5000	More than 7000	More than 12000

The regulations are enforced by game scouts employed by the Tchuma Tchato project. The fines and the licence fees accrue to the project. No information on how much money accrued to the project from this source was available from records. In 1996 this income was evidently used to purchase a banana boat and a bicycle for the use of game scouts.

In 1996, 1,700,000Mts were allegedly derived from fines (personal observation). A game scout was under investigation and a case was pending for mis appropriation of funds. These observations suggest inadequate control, and bring into question the management capacity of Tchuma Tchato.

5.4. Distribution of revenues

Apart from income which accrues to the individual for his or her own effort in the fishery, income accrues to government from licensing and inspection fees. Since the adoption of a policy to promote CBNRM and the initiation of the Tchuma Tchato project the income to government is shared with the community. The income and its distribution are illustrated in Table 5.6.

Table 5.6. Income generated from fishing licences and buyers by way of licence, inspection and border 'facilitation' fees. The institution responsible for collecting fees is shown.
Figures in meticais and converted to US Dollars at US1= 10,000Mts.

Year	Licence fees, Tchuma Tchato	Border facilitation fees, Immigration Department	Inspection fees, Veterinary Department	Total
1996	33,300,000Mts = US3,330	92,880,000Mts =US9,288	1,161,000,000Mts= US116,100	1,287,180Mts =US128,718
1997	28,000,000Mts =US2,800	74,580,000Mts =US7,458	931,500,000Mts =US93,150	1,034,020,000Mts =US103,408
1998	40,800,000Mts =US4,080	116,280,000Mts = US11,628	1,453,500,000Mts =US145,350	1,610,580,000Mts =US161,058
Total	**102,100,000Mts = US10,210**	**283,740,000Mts = *US28,374***	**3,546,000,000Mt =US354,600**	**3,931,840,000Mts =US393,184**

Income from 'inspection' exceeds by far that derived from licensing and border facilitation. This is because in effect 'inspection' alludes to a tax which is paid by those removing fish from the country. This tax is levied at a rate of 1,000.00Mts per fish or bundle of small fish considered by the inspection officer to be equivalent to a large fish. The officer also checks on the condition of fish being exported.

The figures for licence fees are accurate as they are taken from the records held by Tchuma Tchato, who issue the licences. Those for border facilitation and inspection are not accurate because information is poorly recorded by the authorities. They have been estimated as the product of the number of licensed buyers, the number of purchasing trips they are allowed to make (2 per month) and the amount of fine they can take out (maximum 500 large fish equivalents).

A foreign purchaser buys a licence (150,000Mts, US15), which lasts for three months. The purchaser pays 120,000Mts, US12 for border facilitation for three months. He or she can make two trips each month i.e. six trips per licence issued. Each trip permits export of 500 large fish equivalents and draws an inspection fee for 1,000Mts, US0.10 per large fish equivalent.

The calculation suggests a potential income. It is doubtful whether this, if indeed it is realised, finds its way into government coffers because there seems to be no effective receiving system or controls. A much more disciplined approach would be required to accurately document transactions.

A further disadvantage of the current system where record keeping is poor and there is no size limit on fish exported, is that there is little disincentive for those who harvest fish with increasingly small gill nets and other unsustainable fishery practices.

Within the limitations outlined above it is evident from Table 5.6 that about 90% of the income generated by government is by way of inspection fees. None of this is distributed to the community. Neither is the 7% generated from border facilitation. Only the 3% deriving from the licence fees is available for distribution to the community. This is a paltry sum compared with the inspection fee income. If inspection was performed by Tchuma Tchato project there would be a strong incentive to do the job well as they would be direct beneficiaries of the income stream. As it is now, what happens is completely outside of their control. They have little incentive to use inspection as a means of regulating the fishery.

The allocation of income from licence fees is shown in Table 5.7. What is disturbing about this is that over the period 1996-1998 about 50% is allocated to Local and Provincial government. A further 20% is allocated to management of Tchuma Tchato. Only 30% can be perceived by local people as directly benefiting them.

The inescapable conclusion is that it is difficult to reconcile the allocation of responsibilities like inspection and the distribution of income with the principles of CBNRM as espoused by government. It is also difficult to envisage the community being motivated to engage CBNRM and the move towards achieving sustainability when they are marginalised in this way. Until this project is able to become more self-funding and less reliant on donors it is improbable that it will be sustainable.

Table 5.7. Recipients and distribution of income from licensing fees received by Tchuma Tchato

during the period 1996-1998. Data from Tchuma Tchato records. 10,000Mts=1US Dollar

Recipient	**Year**				
	1996	*1997*	*1998*	*Total*	*%*
Community	9,990,000 Mts	8,400,000Mts	12,240,000Mts	30,630,000Mts,	30
Management (TT)	6,660,000 Mts	5,600,000Mts	8,160,000Mts	20,420,000Mts	20
Local government	3,330,000 Mts	2,800,000Mts	4,080,000Mts	10,210,000Mts	10
Provincial/ Central government	13,320,000 Mts	11,200,000Mts	16,320,000Mts	40,840,000Mts	40
Total	**33,300,000 Mts**	**28,000,000Mts**	**40,800,000Mts**	**1o2,100,000Mts *=US10,210***	**100**

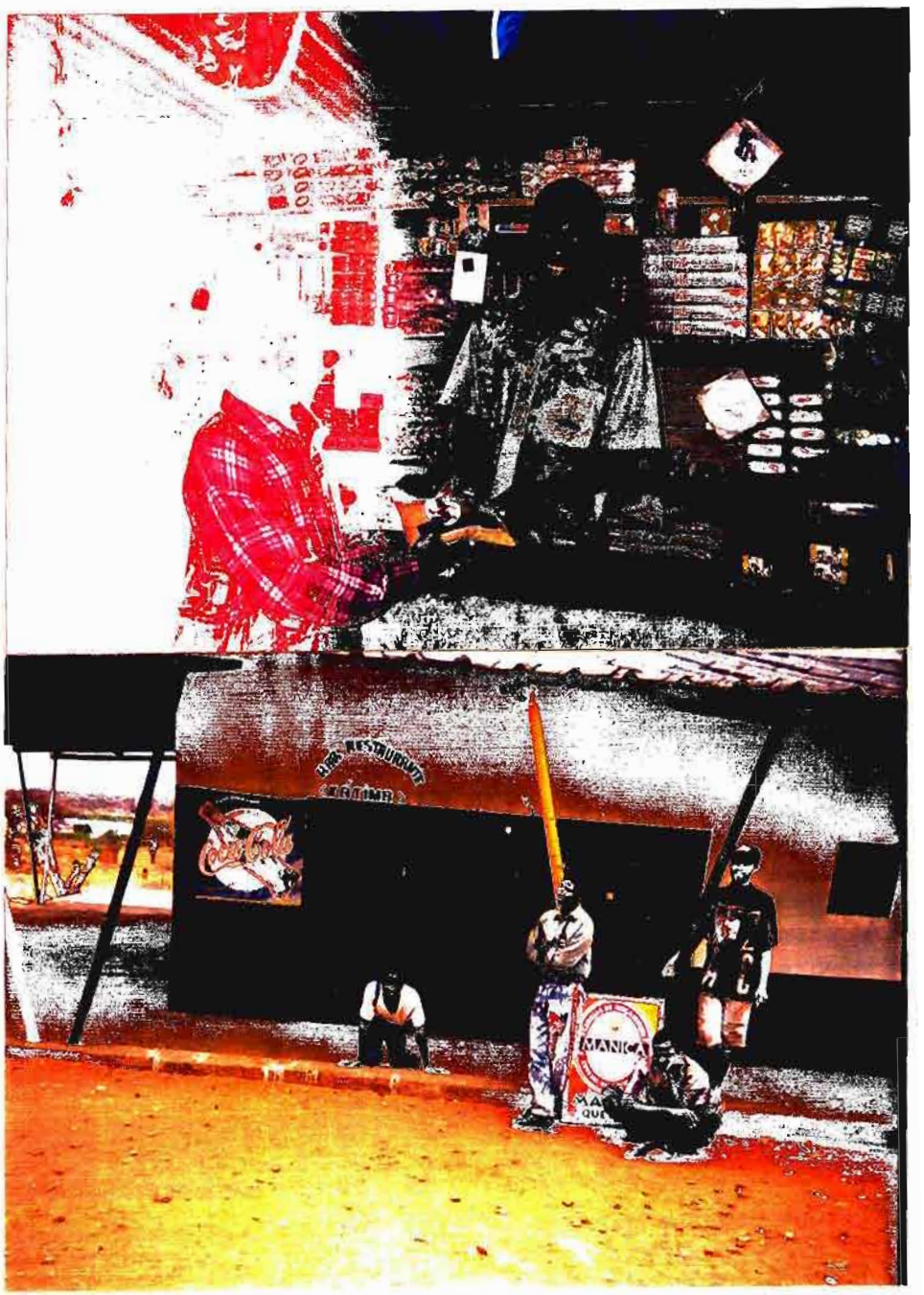

Photo 12. People of Chintopo are now building tuck shops and bars. The people doing so obtained their initial funding for these businesses through artisanal fishing activities.

Photo 13. The household of poor people. This situation leads people to engage fishing which is one of the few options for earning an income.

CHAPTER SIX

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

6.1. Discussion

6.1.1. Introduction

The review (Chapter, 2) considered what little was known of the fishery and the understanding which has developed around CBNRM. Conceptual frameworks were developed describing the evolution of the fishery (Figures 4.1 and 4.2) and the envisaged process of establishing CBNRM (Figure 4.3) .

The latter is underpinned by a number of principles described by Steiner and Rehoy (1993) and Dorm-Adzobu (1995). These are expressed somewhat differently in the analysis of factors contributing to the success and failure of ICDPs presented by Wells and Brandon (1993). These four perspectives together provide a framework for considering both progress in Tchuma Tchato and the prospects for bringing the fishery increasingly under CBNRM.

6.1.2. Wells and Brandon (1993)

Common causes of failure and success are shown in Table 6.1. The performance of Tchuma Tchato bringing the fishery under CBNRM is assessed from the findings of this research and that of Maughan Brown (1998).

Evidence indicates that the approach by government is distinctly regulatory (top down) and this is carried through to the community level where authority is devolved for licensing and policing (game scouts). In reality though, as there is very little co-management, the policies and regulations are set by government. Also evident is that the present system of allocation of government revenue does not yield tangible benefits to the communities. Thus they have little incentive to change how they engage and operate the fishery. This is aggravated further by the low level of sustainable improvements which have emanated from Tchuma Tchato in other sectors, particularly tourism and

wildlife (Maughan Brown, 1998).

Considering features of success it becomes evident that, because of the importance of the fishery in the lives of the people, there is a high potential for matching needs (pers. obs).

The options for improving revenues are somewhat limited because the market is largely in neighbouring countries. It might be possible to promote vertical integration and add value by selling direct but this is limited by time constraints on those who fish. New skills and labour would have to be introduced into the Mozambique communities. If government were to forgo the revenue from inspection, or at least some of it, there could be a significant additional return to the community. This could be used to provide an incentive for change in the fishery to promote sustainable utilisation.

At present people act largely as if they own the resources individually. Obtaining a license is a formality if the applicant has the money to purchase it. Thus change has less to do with securing rights than it has to do with defining the policies and regulations which go with those rights. The system has drifted towards open access and unsustainable use. CBNRM would reverse this trend and reduce conflict, in the longer term. In the short term, however, conflict could increase as change is threatening established practices which lie at the heart of the local economy.

Decentralising licensing and allocation of a component of revenue generated cannot be equated in any meaningful way with decentralised decision making . This is because most of the 'decisions' are meaningless if any resident can obtain a license, and if so little of the revenue is available for disbursement. Allocating a 'policing' function to the community councils could, at best, be decentralised decision making if it were accompanied by a participatory process developing a vision for the manner in which the fishery should be managed (which has not occurred); and at worst it abdicates responsibility for enforcement whilst retaining the right to unilaterally make decisions on policy and strategy.

6.1.3. Steiner and Rehoy (1995)

Progress can be gauged against the five principles (Table 6.1) proposed by Steiner and Rehoy.

One principle is that the resource(s) under consideration should be given 'focussed value'- the benefit of management should exceed the cost thereof. In the fishery there are clear indications of a need to redirect the fishery from its present path to open access to one in which there is greatly enhanced societal control. One way to do this would be for government to redirect a meaningful part of the 'tax' derived from inspection to the community for community benefit. This would also accord with the principle that there should be a positive correlation between the quality of management and the magnitude of derived benefits. At present the fishery may be operated at levels greater than can be sustainable. So, the magnitude of derived benefit cannot easily be increased by raising harvesting levels. This is unlike the situation where one can introduce a new revenue stream by promoting a new activity eg. hunting. It could be that promotion of tourism, incorporating fishing, could increase the revenue stream. The quietest way, however, and which entails minimum capital involvement, is to redistribute the current revenue stream accruing to government.

The present government structure does not easily facilitate co-management of fishery (Chapter 5). This is aggravated by the, as yet, unresolved issues of proprietorship. At present it is clear that those who decide (the unit of proprietorship) are not the same as those who are supposedly to manage the use of the resource. Furthermore the unit of proprietorship has not been made as small as practicable. In reality a hybrid exists between higher level (provincial) and lower level (village council) 'proprietorship' with considerable resultant confusion.

6.1.4. Dorm-Adzobu (1996)

The author identified six principles (Table 6.1) which form a foundation for environment and development strategies.

It is evident that whilst there is political support for both CBNRM and the fisheries management at the highest political levels, this loses some 'cohesion' at the lower levels as they operate

independently and lack integration. There is little evidence of a commitment to co-ordination, strategic planning and the allocation of resources for institutional development. Inded at the lowest levels there is not a single position on the government payroll.

There has been strong donor support but this has occurred in the context of a project proposal and not of a process as envisaged in the government's original plan (DNFFB, 1993), and in that envisaged by the process conceptualised in Figure 2.3, Chapter 2. The government set out, in the first instance, to develop their capacity for intervention. In reality there has been very little emphasis on this during the first five years of the project. The government clearly envisaged itself as an 'agent of change' but until now neither they nor other sectors (eg NGOs) have developed the capacity to play this role effectively. Despite this they have engaged implementation. Whilst this has been shown by Murphree (1995) to be an effective strategy, it has been successful only when there have been 'agents of change' who have the understanding and resources to act in this role.

Table 6.1. Various features and principles which have been derived to promote CBNRM.

Wells and Brandon (1993)
CAUSES OF FAILURE
. Top down
. Lack of tangible benefits
. Lack of sustainable improvement (social and economic)
FEATURES OF SUCCESS
. Matching to needs
. Improving living standards
. Decentralized decision making
. Production of sufficient revenues
. Reduction of conflict
. Securing ownership and rights
. Steiner and Rehoy (1993)
PRINCIPLES OF CBNRM
. Focused value
. Differential inputs differential value

. Correlation between management and benefits
. Unit of proprietorship (who decides)
. Unit of proprietorship (size)
Dorm-Adzobu (1996) **SIX PRINCIPLES FOR ENVIRONMENT MANAGEMENT**
. Institutional choices
. Political support
. Donor support
. Local and sub-national participation
. Implementation
. Capacity development
THE RESEARCH
. Time dependent phase

Dorm-Adzobu also draws attention to what is termed local and sub-national participation. This research suggests weakness in the NGO sector participating at local level and in local government.

Also evident from this study is that whilst a precedent has been established in policy and in organizational structure, the functioning of the system is weakly developed. There is no substantive evidence of 'cross-sectorial coordination in managing the environment'. The principle of ' institutional choices' (Dorm-Adzobu, 1993) is consequently not entrenched in the operation.

6.1.5. This research

The conceptual analysis of the process of CBNRM illustrated by Figure 2.3 suggests that whether one is applying the 'factors for success' (or avoiding those for failure) identified by Wells and Brandon (1993); or one is applying the principles of Steiner and Rehoy and Dorm-Adzobu,it is necessary to envisage their application as time dependant. The philosophy developed here, building on that of Maughan Brown (1998) suggests three phases, preparation, intervention and handover. These phases are not sequential in the sense that one is completed before the next starts. Rather

they overlap. This is necessary as this process should promote a culture of continuous learning and adaption to changing circumstances (Senge,1995; Rogers *et. al* 1999). Central to all of this is the strategic management of knowledge and the diffusion of knowledge (Rogers *et. al* 1999; Senge *et al* 1999 in Senge, 1994).

The evidence accruing from this research shows clearly that the agencies initiating the process, government and the IUCN, were not adequately prepared and that they have not improved much in the five years since the start of the project. There has also been only superficial self evaluation so that there has been too little generative learning (Senge, 1995). The process has shown little, response to its own experiences. This reflects strongly the organizational structure and management culture.

It is also clear that the 'agent of change' engaged implementation (as implied in Figure 2.3) very soon after the government declared its policy. Attempts to transfer management and control also occurred early on, and before there was meaningful capacity building in the community. There appears to have been a complete 'blurring' of the three time dependent phases of preparation, implementation and handover envisaged in Figure 2.3. This probably results from the enthusiasm with which the idea was embraced and a failure to appreciate the complexity of the process being engaged. The failure highlighted in this research provides some support for the hypothesis that the process of establishing CBNRM has time dependent phases which need to proceed, at least to some degree, in sequence.

6.2. Conclusion

This study set out some objectives from which the understanding of the fishery has been developed, the preparedness of the government has been explored, the understanding of how the process of access is controlled and how government and the TT project are to act as 'agent of change' was developed. On the basis of this knowledge, the following conclusions may be drawn:

- The principles and theory which underpin CBNRM are not consolidated into a user friendly format which facilitates knowledge transfer amongst practitioners. This severely constrains

promotion of CBNRM.

- There is too much emphasis on theory and not enough on process and practice.
- Government, NGOs and local structures in Mozambique are inadequately prepared to promote CBNRM. This is in respect of capacity, organisation and resources.
- Insufficient attention is devoted to the process of CBNRM..
- There is no strategic plan.
- There is little generative learning.
- Insufficient attention is devoted to team work and vertical integration.
- It is evident that meaningful progress could be made with integrating the fishery into CBNRM until the macro-issues have been addressed.
- Access is by licence but this does not provide for any real regulation.
- The fishery was tending towards an open access. Licensing does not control harvest pressure.
- The current trend is towards unsustainable levels of harvest.
- Distribution of revenues generated by licences and inspection fees is not distributed in a manner which provides meaningful return to the community.

6.3. Recommendations

This research set out to focus on the fishery. It has, however, exposed weaknesses which are of such consequence that it is not considered useful to address the fishery before the micro-issues are solved. Consequently the recommendations made here are not specific to the fishery:

- The whole approach to CBNRM should be revisited before proceeding with any further expansion of the project.
- There should be a comprehensive strategic analysis which focuses on what was originally intended, namely building capacity for intervention. This should include cross institutional team building; building a shared vision; developing real capacity; and developing a business plan which emphasises both process and product.
- There should be a commitment to a culture of learning so that the team learns from failures rather than fears them.

- There should be a strong focus on building strategic alliances among research and educational institutions and NGOs.

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Predro Massangu, 1998 (Fisherman resident, Bawa) no need for translation

APPENDIX

APPENDIX I

FISHERIES POLICY AND LEGISLATION

From 1990, the government gazetted a number of fisheries policies (Lopes, 1998) and Mukozho, 1998), but within non of policies started the process for managing in-land fisheries. This can be observed on details from the gazetted policies described bellow.

1. Government gazette on fisheries management no.39 "series, 1990

Based on the Mozambican law, fisheries management falls under the Ministry of Agriculture and Fisheries where the management policies and legislation are estibulated under the National Directorate of Fisheries through approval of the parliament. The government set up some provisions relating to management of fisheries, these were published through government gazettes (Government gazettes supplements: series No. 39, 26 September, 1990; series I No. 21, 28 March, 1996 in gazette 1997 also cited in series I No. 10, 17 march, 1998).

The supplement No. 39 series I state the importance from which fisheries sector represents for the country's economic and social development. Further describes general staff organigram for fisheries management in the country including the establishment of inspection and licensing systems for fisheries utilization. Also it states ways how conservation and control of fisheries resources should be undertaken except the establishment of those conservation and control processes which is supposed to be undertaken (law no. 3/90).

There a number of artigos expressing different components on fisheries management processes from which fisheries in the country should follow. Artodo 1 states a number of

definitions of some terminology applied in fisheries management such as: Marine water, in-land waters, fisheries art, annexed operations to fisheries, aquaculture, national collective fishing, fishing boats, Mozambican fishing boats, foreigner fishing boats, subsistence fishing and fishing systems. From this I should defined the definitions which are relevant to this study as follow as:

In-land waters- defined as water found beyond influence of the seawater such as rivers, lakes and lagoons.
The art of fishing-, which means all processes, which involve fishing such as capturing or collection fish and any operation related to fish or fish processing.

National collective fishing- defined as a group of people from the country fishing together and forming their head office within the country.

Subsistence fishing- fishing practiced with or without appropriate fishing equipment being based on the artisanal tools made locally without any technology involved.

Artogo four mentions fishing types applicable in the country such as subsistence fishing, artisanal fishing, semi-industrial fishing, and industrial fishing and fishing for research and experiment. This supplement does not give definitions of these types of fishing with exception of subsistence fishing recommending that such definitions will be provided through regulations to be established later (second supplement series I no. 39, 1990).
It has been stated in this supplement that, fisheries resources under territorial waters is a public domain being under the state responsibilities to establish management processes and policies governing the utilization of the resource (artiogo 4 chapter I). The administration of fisheries resources falls under the council of the ministers. It is one responsible in establishing development plans for fisheries utilization (artigo 5 and 8, chapter I). For the promotion of small scale fishing is under the responsibilities of the national Secretariat of fisheries now called the national directorate of fisheries (third supplement 1998 series I no.10).

In this supplement also states aspects on in-land fisheries whereby the national secretariat of fisheries is been given the powers for in-land fisheries administration and management. The competence above mentioned should be authorized by the Ministry of Agriculture and fisheries in accordance with the orientation from general policy of the development to be defined in collaboration with the secretariat of fisheries (artigo 13 Title II, chap. I).

The following declarations are relating to licensing system and inspection of fisheries product (Title II, section II and Title III chapter II).

Title VI describes government responsibilities in fisheries issues, which include diverse of dispositions, transitory and final management issues namely. Government's when damages occur to fishing product and equipment due government's authority negligence. The council of ministers are the ones responsible in establishing provisions for general fisheries management policies and regulations (Title VI artigo 69, second supplement no. 39, 1990).

2. Government gazette no.21 "series 1996

This gazette under the fisheries law no.3/96 defined all the issues mentioned on the previous gazette discussed above and it focus more on the marine fisheries, therefore it will not be discussed because it is beyond scope of this dissertation.

3. Government gazette no. 10 1998

This gazette states issues relating to regulations of fish Inspection and guarantees for the used of fisheries product for consummations and export.

4. General objectives of the Policy

- It has as objectives for establishing hygiene requirements, sanitary and the quality management which regulate the management of fisheries inspections processes and fisheries product processing, as well as export and import of fisheries products. Aiming to ensure the market needs are followed and consumers protected.

5. General definitions:

1. The words expressed in this present policy have a meaning defined in **law no. 3/90 of 26 September. Designated as Fisheries law.**

2. For the present policy, the following complementary wards means:

a) *Acceptance*: proceeding from which an official organism is invested for its formal recognition to the other organisms, institution, or a person, for representing or to execute determined duties or functions.

b). *Soluble seawater*: seawater, which does not have signs microbiological, toxic substance, and other sort of contamination.

6. Organisation of competent authority (artigo 6)

The structure of the competent authority according to this policy should follow the following requirements:

a) At the Central level

The Department of fish Inspection (DIP)- Under the national Directorate of fisheries, responsible for national system for inspection as well to elaborate plans for inspections, development, implementation, supervision, and control of all the activities relating to inspection of fish, including to train, research, awareness or awareness campaigns, and to represent inspection activities within the national and international territories.

b) Within the Provinces:

Provincial Department of Inspection of (DPIP)- The competence for fishery product inspection is under the provincial Department of fisheries, this is responsible for fish inspection, certification and verification as well as awareness of and represent within the province the activities of inspection.

Laboratory for fishery inspection product (LIP): - It under provincial services of inspection, which is the responsible authority for laboratory analysing of the quality of fishery product as well as participate into fisheries inspection research.

7. Duties for the responsible authority for inspection (artigo 7):

21. The specific functions for this authority according to this degree are as follow as:

- To make inspection and certify that the quality of the fish for whole sell trade market and exportation as well for imported fishery product whether such products are in good conditions according to the requirement mentioned in this policy,
- To make verification whether the conditions are hygiene-Sanitary and to ensure that the quality of storage and transport used are of required,
- To authorise installation and sanitary licensing of the equipment and building for fish product storage, through issuing sanitary licenses for the function.
- To make sanitary verifications and authority fish processing in the fishing vassals through issuing sanitary licenses,
- To Audit the controlling system in place and to ensure that the quality of fishing vassals and instalments or storage facilities,
- To elaborate or to adapt harmonised specifications according to the national legislation and international,
- To make awareness on the national legislation and the international legislation for fishery product inspection within the industrial and market sectors,
- to prosecute anybody who violets this regulations,
- To conduct laboratory analysis off fish product,
- To prepare acceptance of the analysis from the laboratories of fish product,
- To capacitate and to re-capacitate staff working under inspection department, and
- Other functions for the inspection of fisheries product, which might be defined according to fisheries product inspections, to manage regular programmes of inspection.

2.For ensuring that these responsibilities on this present Artigo the Minister of Agriculture and Fisheries, under the proposal of the national Directorate of fisheries, will delegate some of the responsibilities to other organisms under the state organ.

8. National Plan for Inspection (artigo 8):

1. Inspection of fishery product should be conducted according to the national plan of inspection of fishery products, which will have the short, medium, and long term objectives, as well as description of the actions for implementation under the view of human resources, equipment and material, and economic-financial resources.

2. National Plan for fisheries product inspection should be elaborated within a process, which ensure participation of the social organisms, professional and economists relating fisheries processing and harvesting.

9. Payments for the inspection (artigo 14)

The attendant of fish inspection services, sanitary licensing for the inspection, and issuing certificate and necessary laboratory activities; are subject for a payment of the amount to be established under the authorisation from the Minister of Agriculture and Fisheries and the Minister of Plan and Finance under the proposal from the national Directorate of Fisheries, to be applied for self-financing for the inspection services of the fisheries.

10. Export for fishery product (Section III):

a) Requirements for the exportation (artigo 14)

1. The lots of fish for export should respect the following requirements:

- Lots, which have been prepared in, placed legally authorised through sanitary licenses from the staff working in the area,
- From vassals or boats already licensed,
- The product being found in good conditions of conservation in terms of hygiene, free from contamination, adequately applied preservative chemical in acceptable level nationally and internationally, product in good condition for human consumption according to the Artigo 46 and with all requirements mentioned on the annex II (Sensorial evaluation and acceptable limits) according from requirements of the destination country of import.

b) International circulation of fisheries products (Section V). Documents and control for within movement of fisheries product (artigo 22)states that, circulation of fisheries product should be conducted according procedure of sanitary services which are subject to be checked by the responsible veterinary services which will issue a verification declaration according to the forms under annex VIII, which gives a limit of an amount beyond 20 kg.
The responsible authorise can make fish inspection at any moment in relation to the documentation of the fish on transit from one place to another within the country (from one province to another) without prejudice to the legislation under use in the country.

11. International transit of fisheries product (Section VI) :

11.1. Conditions imposed to fisheries product (artigo 23)

Fisheries product on transit should be properly conditioned and storage under the responsibility of customs services according to the proceedings of the Customs.

11.2. Inspection (artigo 24)

a) As a way of preventing contamination from diseases, which might harm the user public, fisheries product on transit should be packed as sealed. The inspection required should be held at the border before crossing it.

B) The responsible authority will submit a travel document according to the format under the annex IX (transit permit) whereby it is obligated to present to the Customs authority.

12. ANNEXES ON FISHERIES INSPECTIONS AND LICENSING

12.1. Annex I: List of Countries where importation of fisheries product is allowed:

I. Countries and territories covered by a specific decision under Council Directive 91/493/EC.

Abania, Argentina, Australia, Bangladesh, Brazil, Canada, Cot, d'Ivore, Chile, Colombia, Cuba, Ecuador, Estonia, Falkland Island, Faroes, Ghana, Gambia, Guatemala, India,

Indonesia, Japan, South Korea, Morocos, Madagascar, Mauritius, Malaysia, Mexico, Maldives, Nigeria, New Zealand, Peru, Philippines, Russia, Senegal, Singapore, Thailand, Tunisia, Taiwan, Tanzania, Uruguay, South Africa.

II. Countries and territories meeting the terms of Article 2(2) of Council Decision 95/408/EC:

Angola, Antiguas and Barbuda, Netherlands Antilles, Azerbaijan(2), Benin, Bahamas, Belize, Switzerland, Cameron, China, Costa Rica, Cape Verde, Cyprus, Czech Republic, Algeria, Eritrea, Fiji, Greenland, Guinea Conakri, Hong Kong, Honduras, Croatia, Hungary(2), Israel, Iran, Jamaica, Kenya, Kazakhstan(‘), Sri Lanka, Lithuania, Latvia, Myanmar, Maita, Mauritius, Mozambique, Namibia, Nigaragua, Panama, Papua New Guinea, Pakistan, Poland, Romania, Slomon Island, Seychelles, St Helena, Slovenia, Suriname, Togo, Turkya, Uganda, United States of America, St Vincent and Grenadines(“), Venezuela, Vietnam, Zimbabwe.

(‘) Authorised only for import of fresh fish

(2) Authorised only for import of caviar

(“) Authorised only for import of live animals intended for human consumption

Source: Official journal of European communities, 18.2.1999).

12.2. ANNEX II: List of Countries and Territories which importation of fishery product intended for human consumption is authorised until the 31 January 1999, on the conditions of the Article 11(7) of Descriptive 91/493/EEC

Bulgaria, Congo Brazzaville, Egypt, former Yugoslav Republic Macedonian, Gabon, Guinea Bissau, Saint Lucia(Ministry of Agriculture and Fisheries, National Directorate of fisheries, Maputo, Provincial Directorate of Agriculture and Fisheries, Departments of Fisheries and Forestry and Wildlife, Tete (ed), 1998/9).

Provided by: Mr. Miguel (SPFFB, Tete) and Dr.Maria (SPAP, Tete) and Mr. Sequela (TT), 1999.

APPENDIX II

INTERVIEWER'S INTRODUCTION TO COMMUNITY/PEOPLE

I'm Mr. Luis Dos Santos Namanha, student from the School of Environment and development University of Natal Pietermaritzburg, republic of South Africa. I came in this Ward of Chintopo to do some studies on the use of natural resources around your area.

I heard while I was at the school that the people of Chintopo ward have seat and agreed to manage their natural resources around the area. Some of these natural resources include wildlife, forestry and water resources which is fisheries. Through some documents which are circulating around the world I came across that wildlife is the only resource which you have started with. at the moment you get some income from sport hunting operations under taken by your safari operator Mr. Piet Hougaard.

Within this concept of your community programme in managing natural resources, I as student on the environment and development issues, I saw that although you have not yet integrated fisheries into this existing programme, but clearly everyone can know that one of the resource which offers good access to use is fish. Women, children and men both of you are able to fish or harvest fish independently the nature of methods someone can use to catch fish. Therefore, these aspect motivated me to come and join you in this my study.

My study is aiming just to try to understand and identify issues surrounding fisheries from that may be the study will be able to give direction which can be useful when time comes for you people to join fishery into this existing your community programme for managing these resources. This study will not resulting in stopping people from fishing but to help if possible ways how you can benefit more from fishing in the same way you benefit from wildlife resources. Also the report from this study will be given a copy to your programme so that you will be able to access what will be found as the study product.

By student: Luis Dos Santos Namanha, University of Natal Pietermaritzburg, R.S.A,. 10/8/1998

APPENDIX III

RESEARCH QUESTIONNAIRE (for interviewing only households)

A: Information on Fishing:

1. Does your household fish?

Yes	No

2. Who in your household fishes?

Head household/ husband	Wife/ Woman	Children

3. Do you meet all your household needs by fishing?

Yes	No

4. How do you obtain cash to purchase household needs?

Selling other product	Selling fish	Through job

5. How important do you rate fishing as a mean of meeting household requirements?

Very important	Important	Not important

6. How much time does you head household spend con fishing activities?

Full time	Some times	Not at all

7. Does your household eat fish?

Yes	No

8. How much of your protein comes from fish?

Most	Some	Very little

9. Does your household sell fish?

Yes	No

10. How much of your cash income is derived from fish sales?

Most	Some	Little	Non

11. Does your household barter fish? If yes for what?

Yes	No

.....

.....

12. How important is bartering?

Very important	Important	Little important	Not at all

B: Information on Farming:

13. Do you produce all your household food needs by farming?

Yes	No

14. Does your household farm?

Yes	No

15. Who in your household farms?

Head household/Husband	Wife/Woman	Children

16. Which is more important to you in your household economy?

Farming	Fishing	Equally important

C. Regulation of Fishing:

17. Who allocates rights to fishing?

TT	Local authority	Tribal/Traditional authority	Informal	No respond

18. Who regulates the fishing?

TT	Local authority	Tribal/Traditional authority	Informal	Non

19. Who establishes the regulations:

TT	Local authority	Tribal/Traditional authority	Informal	Non

..... *Thank you very much see you again* .....

APPENDIX IV

RESEARCH QUESTIONNAIRE (for interviewing anyone from people of Chintopo ward).

Key:

Nos (1,2,3,4 and 5) are codes for categorising the answers for easy loading in the Quattro Pro Spread sheet data analysis.

1. Location (where the interviewed live).....

2. Sex (of the interviewed):

Male (1)	Female (2)

3. How old are you?.....years old..

4. Which educational standards have you done or attempted?

Secondary (1)	Primary (2)	Others (3)

5. What is your occupation?

Farming (1)	Fishing (2)	Both (3)	Others (4)

6. Do you understand the word/concept artisanal fishing?

Yes (1)	No (2)

7. Who mainly practise artisanal fishing in the area?

Men (1)	Women (2)	Both (3)

8. Which age groups do people start practising fishing ?

Between 10 - 20 yrs (1)	Between 21 - 30 yrs (2)	Between31 - 40 yrs (3)	Both and Above 41 yrs (4)

9. Where do fishermen come from?

Mozambique (1)	Zambia (2)	Zimbabwe (3)

10. Amongst bellow listed, which one are the best fishing sites/spots in the area?

Bawa	
Lissico	
Kayembwa	
Kafukudzi	
Ntondo	
Mphanyame	
Mzunga	
Shonkho	
Nyamulombwe	
Chissavo 1	
Chissavo 2	
Chissica	
Kankungulu	
Chamadzidzi	
Namembe	

Others	

11. How are the fishing sites selected(indicators used) ?

Less water current (1)	Deepness of water (2)	Shallowness of water (3)	Both (4)

12. Who authorise/provides fishing rights?

Local government (1)	Tchuma Tchato programme (2)	Traditional authority (3)	Both (4)	Informally (5)

13. Which criteria is used for authorising/controlling artisanal fishing activities ?

Licence (1)	Anti-poaching operations (2)	Both (3)

14. What is the role of artisanal fishing to people ?

As source of protein (food) (1)	As source of income (cash) (2)	Both (3)

15. How fish is been used for in the area?

Trade (1)	Food (2)	Others (3)

16. Who are the beneficiaries from fish or who benefits from the fish?

Fishermen (1)	Fish buyers/traders (2)	Local government (3)	Tchuma Tchato Programme (4)	Both (5)

17. For how long fish has been benefiting people in the area?

Many years (1)	Recently (2)

18. Does the fish support socio-economic life of the people?

Yes (1)	No (2)

19. What are the contribution from artisanal fishing activities ?

Cash (1)	Food (2)	Recreation(3)	Job (4)	Both (5)

20. Who are the fish buyers?

Locals(1)	Zambians(2)	Zimbabweans(3)	Both (4)

21. What are the criteria used to identified the market for the fish?

By the origin of the buyers (1)	Currency needed (2)	Both (3)	Informally (4)

22. What are the origin of the regulations which control the fish market ?

Tchuma-Tchato Programme regulations (1)	Local government regulations (2)	National regulations (3)	Both (4)

23. What are the fishing method mostly used ?

Pushing nets by canoes (1)	People pulling nets (2)	Hooks (3)	Both (4)	Others (5)

24. What are the tools used for fishing ?

Nets (1)	Hooks (2)	Both (3)	Others (4)

25. Which net sizes are used by fishermen?

FISHING EQUIPMENT	SIZES				
Nets	1-1 . 5 inches (1)	2 - 3 inches (2)	3.5 - 5 inches (3)	5.5 - 6 inches (4)	Both (5)

26. The most common fish species:

FISH SPECIES	COMMON (1)	UNCOMMON (2)	UNKNOWN (3)
Characidae **("Tiger fish")**			
Cichlidae **("Tilapia")**			
Mochokidae **("kolokolo")**			
Distinchondontidae ***("nchega")***			
Mormyridae **("nzio")**			
Cyprinidae **("tsimpo")**			
Cleridae **("cat fish")**			
Others			

27. What is the best season for artisanal fishing in the area?

Summer(1)	Winter(2)	Both (3)

28. How do you classify the existing regulations for the artisanal fishing?

Good(1)	Average(2)	Poor(3)	Nil(4)

29. What is the best way for controlling artisanal fishing?

As it is (1)	Change (2)	Nil (3)

30. Do you understand what means sport fishing?

Yes (1)	No (2)	Nil (3)

***By**: Luis Dos Santos Namanha*, University of Natal ; School of Environment and Development, Science Faculty, Pietermaritzburg, R.S.A., 1998

..... *the end* .....

APPENDIX V

Quattro Pro spread sheet(from the first interview households)

Int. village	Tipo#	#fishing	q1.2	q1.3	q1.4	q1.5	q1.6	q1.8	q1.9	q2.1	q2.2	q3.1a	q3.1b	q3.1 c	q3.2	q3.3	q4.1	q4.2	q4.3	q5.1a
bawa	225	100	1	1	2,4	2	1	2	1	1	2	1	1	1	1	2	2	2	2	2
bawa	225	100	1	1	2,4	2	1	1,2	1	1	2	1	1	1	1	2	1	1	1	2
bawa	225	100	1	1	2,4	2,3	1	2	1	1	2	1	1	1	1	2	1	1	1	2
bawa	225	100	1	1	2,4	2	1	2	1	1	2	2	2	2	1	1	1	1	1	1
bawa	225	100	1	1,2	2,3	2	1	2	1	1	2	1	1	1	1	1	2	2	2	1
bawa	225	100	3	1	2,4	2	1	2	1	1	2	1	1	1	1	1	1	1	1	1
bawa	225	100	1	1	2,4	1,2	1	2	1	1	2	2	2	2	1	2	2	2	2	2
bawa	225	100	1	1	2,4	1,2	1	2	1	1	1	1	1	1	1	2	2	2	2	1
bawa	225	100	1	1	2,4	2	1	2	1	1	1	1	1	1	1	2	2	2	2	2
bawa	225	100	1	1	2,4	2	1	2	1	1	1	1	1	1	1	2	1	1	1	2
bawa	225	100	1	1	2,3	2	1	2	1	1	1	2	2	2	1	2	1	1	1	2
bawa	225	100	3	1	2,4	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1
bawa	225	100	1	1	2,4	2	1	2	1	1	1	1	1	1	1	1	1	1	1	2
bawa	225	100	1,3	1	2,4	2	1	2	1	1	1	1	1	1	1	2	2	2	2	2
bawa	225	100	1	1,2	2,4	1,2	1	2	1	1	1	1	1	1	1	2	2	2	2	2
nyanjenje	300	120	1,3	1	2,4	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2
nyanjenje	300	120	1	1	2,4	2	1	2	1	1	1	2	2	2	1	1	1	1	1	2
nyanjenje	300	120	1	1	2,4	2	1	2	1	1	2	1	1	1	1	2	2	2	2	1
nyanjenje	300	120	1	1,2,3	2,3	2	1	2	1	1	1	1	1	2	2	1	1	1	1	2
nyanjenje	300	120	1	1	2,4	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2
nyanjenje	300	120	1	1	2,4	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2
nyanjenje	300	120	1	1,2,3	2,4	2	1	2	1	1	1	1	1	2	2	1	1	1	1	2
nyanjenje	300	120	1,3	1	2,3	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2
nyanjenje	300	120	1,3	1	2,4	2	1	2	1	1	1	1	1	2	2	1	1	1	1	2
nyanjenje	300	120	1	1,2,3	2,4	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2
nyanjenje	300	120	1	1	2,4	1,2	1	2	1	1	2	1	1	1	1	2	1	1	1	2
nyanjenje	300	120	1	1	2,4	1	1	2	1	1	2	1	1	1	1	2	1	1	1	1
nyanjenje	300	120	1,3	1	2,4	1	1	2	1	1	2	2	2	2	1	2	2	2	2	2
nyanjenje	300	120	1,3	1,2,3	2,4	1	1	2	1	1	2	2	2	2	1	2	1	1	1	2
nyanjenje	300	120	1,3	2,3	2,3	2	1	2	1	1	2	1	1	2	1	2	2	2	2	2

Key: q- question
Tipo#- total population number of each interviewed village
#fishing- number of fishing population from the total
The numbers which are not appearing in the abov 14 to 19.4 are the questions for the interview's comments only and such comments are the ones used to support

q5.1b	q5.1c	q6.1	q6.2	q6.3	q6.4	q7.1	q7.2	q7.3	q7.4	q7.5	q7.6	q7.7	q8.1	q8.2	q8.3	q9.1	q9.2	9.5	q10.1	q10.2
2	2	1	1	1	1	1	1	1	1,2	1	1	1	1	1	1	1	1	2	2	2,3
2	2	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	2	2	2
2	2	1	1	3	1	1	4	1	1,2	1	2	3	1	1	5	1	1	2	2	4
1	1	1	1	3	1	1	1	1	1,2	1	2	5	1	1	5	1	1	2	2	4
1	1	1	1	3	1	1	1	1	2	2	23	5	1	2	3	1	2	1	2	3
1	1	1	1	3	1	1	4	1	2	1	2	5	1	2	3	1	1	2	2	3
2	2	1	1	3	1	1	4	1	2	1	2	5	1	1	3	1	2	2	2	4
1	1	1	1	3	1	1	4	1	2	1	2	5	1	1	3	1	1	2	2	4
2	2	1	1	3	1	1	1	1	4	1	2	3	1	1	5	1	1	2	2	4
2	2	1	1	3	1	1	1	1	2	1	2	5	1	1	3	1	1	2	2	4
2	2	1	1	3	1	1	1	1	1,2	1	2	4	1	2	4	1	1	2	2	4
1	1	1	1	3	1	1	1	1	4	1	2	5	1	1	5	1	1	2	2	3
2	2	1	1	1	1	1	4	1	2	1	2	5	1	1	5	1	1	1	2	2
2	2	1	1	1	1	1	4	1	2	1	2	5	1	1	5	1	1	2	2	2
2	2	1	1	1	1	1	1	1	1	1	2	5	1	1	5	1	2	2	2	2
2	2	1	1	1	1	1	1	1	4	1	2	5	1	1	5	1	1	2	2	2
2	2	1	1	1	1	1	1	1	2	1	2	5	1	1	5	1	1	2	2	2
1	1	1	1	3	1	1	1	1	4	1	2	1	1	1	1	1	1	2	2	2
2	2	1	1	1	1	1	4	1	4	1	2	1	1	1	4	1	1	1	2	3
2	2	1	1	1	1	1	1	1	4	1	2	5	1	2	4	1	1	2	2	4
2	2	1	1	1	1	1	4	1	2	1	2	1	1	1	4	1	2	1	2	3
2	2	1	1	1	1	1	1	1	1	1	2	5	1	1	4	1	1	2	2	3
2	2	1	1	3	1	1	1	1	4	1	2	5	1	1	4	1	1	2	2	2
2	2	1	1	1	1	1	1	1	4	1	2	5	1	1	4	1	1	2	2	2
2	2	1	1	1	1	1	1	1	4	1	2	5	1	1	4	1	1	2	2	1
2	2	1	1	1	1	1	4	1	1,2,3	1	2	5	1	1	4	1	1	2	2	1
1	1	1	1	1	1	1	4	1	1,2,3,	1	2	5	1	1	4	1	1	2	2	1
2	2	1	1	1	1	1	4	1	2,3	1	2	5	1	1	4	1	1	2	2	1
2	2	1	1	3	1	1	4	1	4	1	2	5	1	1	4	1	1	2	2	1
2	2	1	1	1	1	1	4	1	4	1	2	5	1	1	4	1	1	2	2	1

the above statistical data.

q10.3	q10.4	q10.5	q10.6	q10.7	q10.8	q10.9	q10.10	q10.11	q11.1	q11.2	q11.3	q12.1	12.2
2	1	1	2	3	1	2	2	1	2	1	2	1	1
2	1	1	2	3	1	2	2	1	2	1	2	1	1
2	1	1	2	1	1	3	2	1	2	2	2	1	3
2	1	1	2	1	1	2	2	1	2	2	2	1	2
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2	1	1	4	3	1	2	2	1	2	2	2	1	2
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2	1	1	2	3	1	2	2	1	2	2	2	1	2
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2	2	1	2	3	1	2	2	1	2	1	2	1	2
2	1	1	2	3	1	2	2	1	2	2	2	1	3
2	1	1	2	3	1	2	2	1	2	2	2	1	3

APPENDIX VI

Quattro Pro spread sheet (second round interview to people of Chintopo)

q1b	q2	q3	q4	q5	q6	q7	q8	q9	q10_baw	q10_li	10_kamb	q10_kaf	q10_nto	10_mpha	q10_mzu	q10_cho	10_nyam
Nyamulo.	1	40	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mphanyan	1	62	2	2	1	2	1	1						1		1	1
Mphanyan	1	58	2	1	2	2	1	1									
Ntondo	1	34	2	3	1	1	1	1				1		1		1	1
Bawa	1	23	2	2	1	1	1	1				1					
Shonkho	1	37	1	1	1	1	1	1						1			
Bawa	1	42	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bawa	1	30	3	2	1	1	1	1					1				1
Bawa	2	62	1	1	1	1	1			1		1					
Nyanjenje	1	31	1	4	1	1	2	1	1	1	1		1	1			1
Bawa	1	35	3	4	1	1	4	2	1	1	1	1	1	1	1	1	1
Chitete	2	31	2	1	1	1	4	1	1	1	1	1		1		1	
Chitete	1	51	3	1	1	3	4	1	1	1							
Chintopo	1	34	2	3	1	1	4	1	1	1	1	1		1			1
Bawa	1	37	3	3	1	1	4	1	1	1	1	1		1		1	1
Bawa	1	32	2	3	1	1	4	1	1	1		1		1			1
Kafukudzi	1	30	1	4			4	1								1	1
Capessa	1	40	3	1	2	1	4	1		1			1	1		1	1
Bawa	2	20	2	1	1	1	4	1								1	
Nyamulo.	1	37	2	1	1	2	1	1						1			
Nyanjenje	1		3	4	1	1	4	1						1		1	1
Lissico	1	31	1	4	1	1	4	1		1	1	1			1	1	1
Ntondo	1	45	3	1	1	2	1	1						1			
Kayembwa	1	40	2	1	1	1	1	1								1	1
Lissico	1	55		1	1	1	4	1								1	1
Lissico	2	44		1	2	1	4	1								1	1
Bawa	1	35	2	1	1	1	1	1					1		1		
Bawa	1	35	2	1	1	1	4	1							1		
Bawa	1	46	2	1	1	1	1	1				1					1
Chitete	1	20	2	3	1	1	4	1		1				1			1
Bawa	1	34	3	1	1	1	4	1									1
Chitete	1	60	3	1	1	1	4	1								1	1
Chitete	1	40	2	3	1	1	4	1		1				1			
Chitete	1	30	2	3	1	1	4	1		1							1
Chitete	1	20	2	2	1	1	4	1		1		1		1			1
Chintopo	1	30	1	1	2	1	4	1									
Lissico	1	35	3	4	1	3	1	1						1			1
Mamwira	1	41	2	2	1	1	1	1								1	1
Mamwira	1	53	3	2	1	2	1	1						1		1	1
Nyanjenje	1	43	2	1	1	1	1	1						1		1	1
Bawa	2	40	2	1	2	1	4	1									
Bawa	1	41	3	3	1	1	4	1									1
Bawa	1	30	2	1	1	1	4	1						1			1
Chitete	1	66	3	1	1	2	1	1						1		1	
Mphanyan	2	31	3	2	1	1	4	1	1			1		1	1		1
Nyanjenje	1	42	2	1	1	1	1	1		1	1	1		1			1
Nyanjenje	2	27	3	1	2	1	4	1				1	1	1		1	1
Chintopo	2	35	3	1	2	1	1	1									1
Mphanyan	1	48	3	4	1	3	4	1	1	1	1	1	1	1	1	1	1
Capessa	1	42	3	1	2	1	2	1									1

q10_chl1	q10_chl2	q10_chlss	10_kangu	10_cham	q10_nam	q10_oth	q11	q12	q13	q14	q15	q16	q17	q18	q19	q20	q21
1	1	1	1	1	1	1	4	4	1	3	1	12	1	1		2	1
			1				4	4	1	3	1	5	1	1	1	2	1
						1		4	3	1	1	5	1	1	5	2	1
1	1	1	1	1	1	1	1	4	1	1	1	5	1	1	1	23	1
							2		1	2	3	5	1	1	5	2	1
1	1	1	1				2	4	1		1	5	1	1	5	2	1
1	1	1		1	1	1	4	4	1	1		12	1	1	5	2	1
1	1						2	4	1	3	3	5	1	1	5	2	1
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1	1	1	1	1			4	4	1	3	3	5	1	1	5	2	3
1	1	1	1	1	1		4	4	1	3	3	5	1	1	5	2	2
1	1	1	1	1			4	4	1	3	3	5	1	1	5	23	1
			1	1			4	1	1	1	3	5	1	1	5	1	1
		1		1			4	4	1		3	5	1	1	5	2	4
1	1		1	1			2	1	1		3	5	1	1	5	2	1
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1	1	1		1			4	4	1		3	5	1	1	5	2	1
1	1	1	1	1			2	4	1		3	5	1	1	5	2	2
	1	1					2	4	1		2	5	1	1	5	2	3
1	1			1	1		4	4	1	2	1	12	1	1	1	1	3
1	1	1	1				4	2	1		3		1	1	5	23	3
1	1	1	1				2	4	1		3	5	1	1	5	23	3
1	1	1	1				4	2	1	1	1	5	2	1	5	2	
1		1					2	3	1	1	3	5	1	1	1	2	1
1	1	1					4	3	1		3	12	1	1	5	2	1
1							1	4	1	1	2	5	1	1	5	2	1
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1	1		1				4	4	1		3		1	1	5	2	3
1		1					2										
1							4	2	1				1	1	5	1	1
1	1						4	4	1		3	5	1	1	5	2	3
1		1		1			4	4	1			5	1	1	5	4	3
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							2	4	1		3	5	1	1	5	2	3
					1		4	5	1	3	2	1	1	1	1	1	1
1	1		1				4	4	1	1	1	5	1	1	5	2	3
1	1						2	4	1	3	1	12	1	1	1	2	3
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		1					2	2	1			5	1	1	5	2	3
1	1	1					2	2	1		3	5	1	2	2	2	
1	1	1					4	4	1		3	5	1	1	5	2	3
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1	1	1	1	1	1	1	4	4	1		3	5	1	1	5	4	3
1	1	1	1			1	4	2	1		2	5	1	2	5	4	3
1	1	1	1	1	1	1	4	4	1	3	3	5	1	1	5	4	3
1	1	1	1				4	1	1	3	3	5	1	1	5	4	3

q22	q23	q24	q25	q26tiger	q26tilapi	q26koi	q26nch	q26nzi	q26tsl	26catfish	q26oth	q27	q28	q29	q30
2	1	3	2	1	2	1	1		1	1	1	1	4	3	3
2	2	1	23	1	2	1	2	2	1	1	1	1	4	1	3
2	1	3	2									1	4	3	3
2	1	3	23	1	2	1	1	2	1	1	1	1	1	2	1
4	4	1	23	1	1	1	1	1	1	1		1	2	3	1
1	4	3	5	1	1	1	1	1	1	1		3	2	3	1
12	4	3	5	1	2	1	1	2	1	1		1	2		2
2	4	3	5	1	1	1	1	1	1	1		3	2		2
2	4	3	23	1	1	1	1	1	1	1		1	3	2	3
2	4	3													
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4	4	3	12	1	1	1	1	2	1	1		1	2	2	1
2	4	3	12	1	1	1	1	1	1			1	2		1
2	4	3	2	1	1	1	1	1	1	1		1	2	2	3
	4	3	5	1	1	1	1	2	1	1		1	1	1	1
	4	3	2	1	1	1	1	1	1	1		1	2		2
1	1	3	5	1	1	1	1	1	1	1		1	1	3	2
1	1	3	12	1	1	1	1	2	1	1		1	2	2	1
1	4	3	23	1	2	1	1	2	1	1		1	4	3	3
		3	5	1	1	1	1	2	1	1		3	2		1
1	4	3	5	1	1	1	1		1	1		1	2		1
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4	4	3	5	1	1	1	1	1	1	1			2		1
4	4	3	12	1	1	1	1	1	1	1	1		2	3	1
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2	1	3	23	1	2	2	2	2	2	2	2	1	4	3	3
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	4		5	1	1	1	2	1	1	1		1	2		3
12	4		1	1	1	1	2	1	1						
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4	4	3	23	1	1	1	1	1	2	1	1	1	2	2	1
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2	1	3	2	1	2	1	1	2	1	1	1	1	3	3	3
12	1	3	2	1	1	1	1	2	1	1	1	1	3		3
4	4	3	23	1	2	1	1	2	1	1	1	3	2		1
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