



GERFFA PROJECT

Community Forestry Component

Nhambita Community Project Report (December 1997)

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ACRONYMS

ADB	African Development Bank
BMI	Body Mass Index
DNFFB	National Directorate for Forestry and Wildlife
FAO	Food and Agriculture Organisation
FHI	Food for the Hungry International
FRELIMO	Frente de Libertacao de Mocambique
GERFFA	Gestao dos Recursos Florestais e Faunisticos
GIS	Geographical Information Systems
GNP	Gorongosa National Park
GPS	Geographical Positioning System
GTZ	Deutsch Gesellschaft Fur Technische Zusammenarbeit
IUCN	International Union for the Conservation of Nature and Natural Resources
NCHS	National Centre for Health Statistics (US)
NGO	Non-Governmental Organisation
PIP	Priority Implementation Programme
PRA	Participatory Rural Appraisal
PRRS	Reintegration and Reconstruction Program for Sofala
RENAMO	Resistencia Nacional Mocambicana
RSC	Research Consultancy Services
RRA	Rapid Rural Appraisal
USAID	United States Assistance in Development
UNDP	United Nations Development Programme

GLOSSARY

- Homestead** Area on which family live. Houses, grain stores and livestock are found in this area.
- Machamba*** Farming areas. May be surrounding homestead or in nearby area. Each family tends to have an additional *machamba* on the floodplain area
- Regulo*** Hereditary leader in the traditional system of a demarcated area of land, known as the *Regulado*.
- Regulado*** Area of land traditionally governed by the *Regulo* (as opposed to the FRELIMO political system of governance).

1.0. INTRODUCTION

The way in which development is delivered has changed in recent years. This change is described by some as a 'paradigm shift' (Chambers, 1993). It has involved a move from 'top-down' activities, where development occurs 'for' local people, to grassroots activities, where development occurs together 'with' local people. This change was brought about in response to the failure of many projects that were delivered in a 'top-down' manner, which omitted local people from the decision making process. It was therefore recognised that projects were more likely to succeed if they were needed by the community and promoted local participation in all aspects of the project cycle (identification, planning, implementing, monitoring and evaluation).

At the same time, the importance of local indigenous knowledge (which was traditionally recognised only by anthropologists) and the capabilities of local people began to be widely accepted. People of developing nations were no longer regarded as helpless victims, but as capable managers of their own environment and systems.

This led to the realisation that local knowledge should be collected through community research, prior to planning any development activities. For example, the needs and problems of the community need to be identified in a holistic manner, involving an investigation into the socio-cultural, economic and political context in which the community functions. Equally important are indigenous knowledge and management systems, which provide information regarding traditional activities. With this detailed understanding of how a community operates, it is possible to plan successful development activities with the community, which build on the existing strengths.

A variety of techniques exist to collect such information from a community. These include, questionnaire surveys, social anthropological techniques (participant observation), participant rural appraisal (PRA) and rapid rural appraisal (RRA). Some of these techniques, such as participant observation, are not new practices, but are the traditional tool of anthropologists such as Malinowski, who used such techniques in the 1920s in his study of the Trobriands. Other techniques such as PRA and RRA are relatively recent developments. The techniques also differ in terms of the type of information that is produced, with questionnaires typically providing quantitative information and the remaining techniques tending to produce qualitative information. There are however, wide variations within each technique.

In many cases one technique of data collection is favoured exclusively over another. Some researchers, for example believe questionnaire surveys to be “*the central ‘real world’ strategy*” (Robson, 1993). However, it is debatable whether any one technique can practically provide the entire information needs of any particular situation. This is especially so in terms of development activities. For example, it may not be practical to carry out a two-year anthropological study in a community if development activities are needed immediately. A large amount of information would be produced, but the time-scale would be unfeasible. For different reasons, a short questionnaire or RRA/PRA session carried out in a minimal number of places would be equally invalid. In this case the time scale may be appropriate but the amount of information generated would be insufficient.

It is however essential that the methodology selected will facilitate the production of data that is appropriate for its intended use. Obviously, a very different type of methodology would be needed to provide information about, for example, a) the exact number of people in a community taking honey from the forest and b) the attitude of the community to conservation. The type of methodology required therefore depends on how the information is to be used.

The overall purpose of this report was to develop, implement and analyse a specific methodology for the collection of information from a community situated in the buffer zone of Gorongosa National Park (GNP), in Sofala Province of central Mozambique. The information was requested by the Wildlife Management Component of the *Gestão dos Recursos Florestais e Faunísticos* (GERFFA) Project to assist in the formulation of a ‘model of good practice’ management and development policy for the buffer zone of the park. It was also to be used in the identification of potential small-scale development projects within Nhambita, the community in the buffer zone that was studied.

The study focused mainly on natural resource use and management, specifically forestry and wildlife. In order to facilitate the formulation of both policy and development activities, it was essential that the data would provide an accurate combination of quantitative and qualitative information. Data was also needed regarding socio-cultural, economic and political activity. This was in addition to indigenous knowledge and management practices and identification of the needs and problems of the community.

In order to produce such data, a methodology was devised that involved a combination of methodologies (PRA, RRA, questionnaire surveys and anthropological techniques). It was concluded that using a combined methodology provided a relatively appropriate, accurate and wide range of information in a holistic manner. It improved the quality of the data by allowing information to be cross-checked and triangulated. The different methodologies also provided a complementary combination of qualitative and quantitative information that was useful for both the formulation of policy and for planning future development activities.

The main aim and specific objectives of the research are shown below.

1.1 Aims and Objectives of Study

Main Aim

To develop, implement and analyse a specific methodology for the collection of appropriate and accurate information from a community, prior to the formulation of development policy and introduction of development activities.

Specific Objectives

- Overview of recent Mozambican history and the GERFFA project
- Overview of historical trends in development.
- Examination of indigenous knowledge and the need for participatory community studies prior to development activities.
- Examination of the types of social enquiry methodologies available.
- Presentation of selected results from the Nhambita study to emphasise strong and weak points of each field methodology.
- Presentation of conclusions
- Statement of limitations to study and areas of further research.

The study will be arranged as follows: Following this initial introduction, section two will very briefly examine the overall methodology used in the study. Sections three to six will provide background context to the study. Section three examines recent Mozambique history, including the civil war and its effect on natural resources, assistance given by different organisations and the GERFFA Project. The aims and objectives of the Nhambita study will be explored in this section.

Section four examines the historical trends in development activities. This provides information regarding the origins of development and different associated theories. Failure of top-down development will also be explored along with the move towards a grassroots approach, which led to participatory development and wide scale recognition of indigenous knowledge.

Section five examines the reasons why community research is needed prior to the formulation and implementation of development activities. It also examines the value of indigenous knowledge and the benefits associated with community participation in research studies.

Section six examines four types of methodologies that can be used in community studies. The advantages and disadvantages of each are examined. This is followed by a presentation of the methodology developed for the Nhambita study, which is a combination of all four methodologies.

Section seven presents selected results from the field activities carried out in Nhambita. These results are presented in order to clarify how each methodology was used and the type of information that was produced. Each methodology is examined separately with a final summary of the benefits and drawbacks associated with each technique.

Section eight presents the conclusion, in which the overall advantages and disadvantages of using a combined methodology are examined. Section nine then briefly analyses the limitations to the study and areas of further research.

2.0 METHODOLOGY

Two methodologies were used in this study. These included a period of desk study and a period of fieldwork. The desk study involved background reading and the identification and development of a suitable field methodology. Planning and organising the field study also took place during this period. The background reading served two purposes as follows:

Provision of context to the enquiry. This involved research into the historical trends and changes in development activity, justification of community studies, methodologies available for use in community studies, particularly prior to development activities and associated advantages and disadvantages of each technique. Development, sociological and anthropological literature were reviewed during this period of enquiry.

Provision of information to facilitate the field-study. This included research into background material regarding Mozambique, from both an historical, anthropological and development context. Traditional methods of resource use and management by local communities were also investigated, primarily so that important issues could be identified for examination in the field. Previous studies carried out in nearby areas by development organisations were also consulted. This provided additional information about the study area and community practices that were likely to be encountered. It also gave an indication of the type of study that is normally carried out by such organisations prior to project implementation.

The field methodology involved 12 months of working with the Nhambita community, including 2 months living on the homestead of the *Regulo* or community leader. Data was gathered using a combined methodology (see section 6.7 for a detailed analysis of the field methodology). Data analysis took place both during and after the field study.

3.0 MOZAMBIQUE: BACKGROUND INFORMATION AND THE GERFFA PROJECT

Mozambique, occupies a long, narrow strip on the eastern coast of southern Africa. It is bordered by South Africa to the south, Zimbabwe to the west, Malawi to the north-west and Tanzania in the north-east. The recent history of Mozambique is fraught with warfare and destruction and present conditions in the country can only be viewed within this context. The Independence War from Portugal took place in 1964-74 and was followed swiftly by the FRELIMO/RENAMO civil war that began in 1976, intensified in the early 1980s and eventually ended in 1992 (Finnegan 1992). The Rome Peace Accord was signed in 1994.

Over thirty years of warfare, associated with recurrent drought, has led to the classification of Mozambique as one of the poorest countries in the world. Average per capita income in 1991 was approximately US\$80. It is estimated that nearly half of all urban and rural households cannot meet minimum daily calorie requirements from their own resources and two-thirds of the population live in absolute poverty (GERFFA, 1996). In addition, many parts of the country have little infrastructure (including transport networks) or services (including health facilities and schools) as a result of the conflict.

Natural resources are of importance to the Mozambican economy and include forest (hardwood timber), wildlife and some minerals. It is estimated by Saket (1994) that 78% of the land area of Mozambique is made up of forest or potential forest. However, though the resource base is described as relatively rich, according to Moyo et al (1993) it is only partially explored and developed.

In terms of natural resources (notably, forest and wildlife resources), the conflict period has had varied effects. Prior to 1980 it is estimated that three quarters of the population of Mozambique lived in rural areas. However, the widespread destruction caused by the civil war and drought have resulted in the out-migration of some 1.5 million people from rural areas to settle in peri-urban and urban areas and over 1 million displaced people living in neighbouring countries (GERFFA, 1996). This had two implications on forestry resources: firstly, expanding populations in urban and peri-urban areas led to increased localised use of forestry resources in these areas and consequently localised resource degradation. Secondly, rural to urban migration has led to the regeneration of forestry resources (Saket, 1994). This scenario is again changing however, as a large number displaced people have now moved back to their original areas.

In terms of wildlife, the conflict has had a devastating effect. Prior to the conflict period wildlife resources had been an important part of the Mozambican economy. Gorongosa National Park (GNP) for example, is described by Finnegan (1992) as being “*a world famous big-game hunting ground that attracted 20,000 tourists a year*”. GNP is one of four national parks within Mozambique and was closed by FRELIMO in 1973 during the war of independence. The relatively short time in which the civil war followed the war of independence resulted in the continued closure of the park. Indeed, during the civil war the area around Gorongosa became a stronghold for RENAMO soldiers.

As a consequence of continued closure and military activities in the area, GNP was no longer protected, conservation activities ceased and unsustainable hunting activities proliferated, including ivory trading, carried out mainly by military personnel and professional hunters (Moyo et al., 1993). This has led to a serious decline in the number of animals, a situation replicated in all the national parks and smaller reserves in Mozambique. In the case of Gorongosa, military activity has also destroyed much of the infrastructure in the area, and though some landmine clearance has taken place, the area is not completely mine-free. These factors affect not only opportunities for tourism and economic activities within local communities, but also the ability of local communities to participate in sustainable hunting practices.

Many organisations have given assistance to Mozambique in terms of relief and rehabilitation including: the World Bank, World Food Programme, United Nations Development Programme (UNDP) and the Food and Agricultural Organisation (FAO) of the United Nations. Locally, Sofala Province has also received assistance from international organisations such as Food for the Hungry International (FHI), Deutch Gesellschaft fur Technische Zusammenarbeit (GTZ) and World Vision. Initially, during the relief phase of assistance, this involved issues of food security and the distribution of food aid. More recently, the development of agricultural activities has been promoted through the training of extension workers working with local communities. As yet, few organisations have been involved in tackling problems relating to achieving sustainable management and development of forest and wildlife resources.

There is, however a need for such activities. This is for several reasons: firstly, regeneration and development of national parks will provide government revenue through tourism and will benefit

local communities through tourism related income generating activities. Secondly, such activities will assist communities in their sustainable management of regenerated natural resources in rural areas that were previously abandoned. Thirdly. These activities will assist communities in regenerating and sustainably managing depleted resources in urban and peri-urban areas.

3.1 The GERFFA Project

The GERFFA (*Gestão dos Recursos Florestais e Faunísticos*) project was identified in March 1992 and designed in February 1993 by the Investment Centre Division of the Food and Agriculture Organisation of the United Nations (FAO/UN) at the request of the Moçambican Government and the African Development Bank (ADB). The project was conceived to contribute to sustainable forestry and wildlife management, conservation of biological diversity, soil conservation and community focused forestry activities (social forestry). Project components include forest inventory and management, Wildlife Management, Institutional Strengthening and Social Forestry. The project is based in Sofala Province, central Mozambique, focusing on GNP and the Beira Corridor (a strategically important road link with Zimbabwe). This area was the locus of conflict activities and consequently is the area where most destruction and population movement occurred. The project also covers northern Sofala Province, an area rich forest (timber) resources.

It is intended that the project will produce ‘models of good practice’ that can form the basis of future wildlife and forestry management throughout Mozambique. However, restorative activities within GNP and the implementation of community programmes in GNP, the buffer zone and the Beira Corridor also form an integral part of the project. GERFFA also made a sum of \$95,000 available through a scheme known as Priority Implementation Projects (PIPs) for the implementation of small-scale development projects that are to operate on a ‘revolving fund’ basis. This involves loaning money to the community for specific projects identified by the community. When the loan is repaid to GERFFA it becomes available for reinvestment in other communities. In order to fulfil these aims the project has three operational components as follows:

1. **Managed Forestry** – which is involved in the implementation of forest inventory and the development of a forest concession system.

2. **Wildlife Management** – which is involved in the management of wildlife resources in GNP, protection of biodiversity and development of the economic potential of wildlife resources.
3. **Social Forestry** – which is involved in increasing community participation in forestry activities (including agroforestry and natural forest management).

In order to create an effective natural resource management plan, it is important that the needs of the various stakeholders are taken into consideration and the activities of each group, together with their interactions with the natural environment, are clearly understood. Managed Forestry and Wildlife Management, for example, needs to consider the needs of local communities living in forest concession and wildlife areas (respectively). This is so that conflict can be avoided (for example between timber loggers or GNP authorities and local communities) and different groups of actors can work together to sustainably utilise resources in a mutually beneficial manner.

The socio-economic section of the project overlaps and operates in conjunction with each project component to provide information relating to local communities that can be used in the formulation of ‘models of good practice’ and community development projects. The information needs of each component vary slightly according to the aims of the component and the research study is tailored accordingly.

This study, however, relates to the study that was carried out by the socio-economic section on behalf of the Wildlife Management Component in the buffer zone of GNP. This was the first socio-economic study to be implemented and a combined methodology was developed specifically for the investigation, as shown in Section 6.7.

3.2 Information Requirements of Wildlife Management Component

Gorongosa National Park (GNP) has an extensive buffer zone with a population of approximately 120,000 inhabitants. The management of GNP as an established wildlife conservation area is directly linked to the management of the buffer zone. This is because the buffer zone acts as a transitional area between the conservation area of the park and non-conservation area external to the park. In theory, the buffer zone protects the park from activities occurring in external areas, while inhabitants of external areas are simultaneously protected from wild animals.

Traditionally, however, conflicts exist between GNP and local communities in terms of land-use within the buffer zone. In order that the buffer zone can function effectively, natural resources in that area, such as forestry must remain intact. In addition, animal species moving into the buffer zone must also be protected from unsustainable hunting activities. Consequently, in order to preserve the buffer zone, GNP authorities are formulating a management and development plan that may impose certain restrictions on, for example, the use of natural resources, shifting cultivation and burning activities by communities living in the buffer zone. However, the numerous communities inhabiting the buffer zone area need to use these natural resources in order to survive. In the present situation, lack of economic activity in the buffer zone area, associated with lax law enforcement since the conflict period, has resulted in increasing reliance on freely available natural resources that are used to meet basic needs.

The conflict is therefore between land-use for subsistence activities and land-use for conservation purposes. The implementation of the GNP management plan may lead to resentment from local communities if, for example, local people no longer have uncontrolled access to sources of animal protein and income generating activities associated with hunting. This may be especially problematic as farmers regard certain species of animals as agricultural pests. In addition, local communities have not as yet gained any benefits from living within the park area for example, through tourism activities. If community needs are not incorporated into the plan, local people may be expected to give up activities on which they depend with no associated benefit, which is clearly a potential conflict situation.

In terms of the development of GNP, it is of the utmost importance that the conflict between GNP and local communities is resolved, particularly as the park covers a very large area and is not fenced. In some cases government authorities have attempted to address and solve such conflicts through law enforcement and administrative measures. In the case of GNP, the number of game-guards is insufficient to protect the whole area and fencing is economically unfeasible (it is also a source of potential conflict). Additionally, both of these measures have proved to be ineffective in other areas.

Rather than coercive law enforcement, alternative methods are being sought to ensure that the needs of both GNP and local communities are met. The aim of the Nhambita study was to provide

detailed information regarding one representative community in the buffer zone. This information can be then incorporated into the management and development plan for the buffer zone, taking community resource use, needs and problems into consideration and providing a balance between conservation and over-use, namely sustainable utilisation of resources.

In addition, as local communities have not yet seen tangible benefits from tourism, it was considered that some form of benefit or compensation should be provided through the introduction of PIPs. It was anticipated that this would promote co-operation between local communities and GNP, in order that a good working relationship between the two groups of actors could be established. It was also hoped that stimulation of economic activity in the area through the PIPs might result in decreased reliance on the natural resource base. Nhambita was the first site where PIPs were to be introduced. Consequently, a further aim of the study was to identify areas in which a PIP was needed and could be successfully implemented in partnership with the community. A summary of the aims and objectives of the Nhambita study is shown overleaf.

3.3 Aims and Objectives of the Nhambita Study

Main Objective: Collection of community information to facilitate the formulation of appropriate development plans

Specific Objectives: 1) Collection of baseline information for GNP in order to improve understanding of local communities and their interaction with the resource base and national park.

2) Identification of needs and problems in the community, which could be resolved through small-scale development activities implemented through the PIP fund.

The following list indicates the main focus areas of the study:

- Descriptions of traditional and political systems of control and systems of organisation.
- Analysis of natural resource use (local and outsider, specifically forest and wildlife).
- Analysis of natural resource access, management and constraints.
- Examination of attitudes towards GNP, restricted activities and future relationship.
- Examination of perceptions of deforestation and tree planting activities.
- Gender analysis of natural resource use and management.
- Analysis of livelihood systems and income generating activities.
- Examination of farming system activities.
- Specific cultural and traditional practices and beliefs.
- Identification of specific community problems and potential PIPs that may overcome these problems.
- Examination of attitudes to social forestry and agroforestry activities and potential projects.
- Use of non-natural resources – infrastructure, services, transport systems, employment opportunities, markets, access to health facilities, school facilities and mills.

4.0 THE CHANGING FACE OF DEVELOPMENT

4.1 What is Development?

A plethora of definitions exist to describe development, which usually vary according to the disciplinary orientation of the author. However, definitions usually pertain to issues such as *“processes of social and economic change...precipitated by economic growth”* (Gardner and Lewis, 1996:25) and *“strengthening people’s capacity to determine their own values and priorities and organise themselves to act on these”* (Eade and Williams, 1995:9). Development is also associated with concepts such as *“sustainability, institutional capacity and capability, poverty reduction, empowerment, gender relations and environmental protection”* (Mikkelsen, 1995:33).

The concept of ‘sustainable development’, where development *“meets the needs of the present without compromising the ability of future generations to meet their own needs”* (WCED, 1987) has gained much support in recent years. According to Kirkby et al (1995:2) sustainable development *“has a strong people-centred ethical stance, concentrating on the satisfaction of human needs...including nutrition, health and shelter”*.

Despite such worthy objectives, development is considered by many to have failed. Kirkby et al (1995:2) state that *“though continuing attempts have been made through aid programmes since the Second World War to accomplish development in the South, it is clear that relatively little has been achieved”*. Numerous examples exist which confirm this failure. According to the United Nations for example, one billion people are still without basic health services, 1.3 billion drink unclean water and 1.5 billion are illiterate (Economist, 1996). Additionally, Eckholm (1982) argues that the number of desperately poor people (one-fifth of the global population) remains constant, while Timberlake and Thompson (1990) state that 14 million children die under the age of five in the developing world in an ordinary year.

These failures have occurred regardless of the large financial inputs into aid. An estimated \$50 billion was invested in 1996 alone. This is despite a global trend of reducing aid budgets since 1992 (Economist, 1996).

Reasons argued for the failures in development are many and varied. It has been argued that development has failed due to the inappropriate nature of western mainstream economic policies and hidden agendas that have been associated with the delivery of aid (Mehmet, 1995). Bilateral aid, for instance, may be 'tied', meaning that aid provided to a recipient country must be used to purchase goods produced in the donor country, often at inflated prices. In this context, it is argued that aid is given in order to produce markets for donor goods, rather than to promote development. Aid is therefore regarded by some as a form of neo-colonialism, where the rich countries of the North continue to exploit poorer countries of the South (Escobar, 1988, 1995).

Bilateral aid may also be aimed at promoting international diplomacy rather than development. For example, a country may use aid to reward loyal friends and mobilise support against enemies. This practice was particularly apparent during the Cold War and resulted in 'proxy wars' in numerous countries. In Mozambique, for example, the FRELIMO government was supported during the civil war by the Russia, while RENAMO were supported by the South African apartheid government which aimed to destabilising FRELIMO and prevent the spread of communism within southern Africa.

Questions have also arisen regarding the deployment of funds through multilateral aid organisations such as the World Bank. In this context aid is only provided under certain terms of 'conditionality', which are in line with monetarist economics. Though the World Bank must ensure recipient countries have the capacity to repay loans, such policies have tended to minimise the importance of social welfare and according to Kirkby et al (1995:3), have led to "*less expenditure on health, education and welfare, further depriving the poor*".

Alternatively, failure in development initiatives has been blamed on implementing organisations at a project and national level. Kiggundu (1989) for example indicates that "*many organisations do not have adequate capabilities effectively to manage development initiatives or to manage themselves*". Additionally, NGOs are also criticised for their lack of accountability and co-ordination which Farrington et al (1993) state "*can lead to situations where within one region several organisations are each working away duplicating efforts, replicating mistakes, using conflicting approaches and generally confusing the rural poor. Such circumstances may sometimes arise because of deliberate neglect, because NGOs end up competing for clients and against each other*".

Others blame the ideology and approaches associated with development for its failure. Gardner and Lewis (1996:1) for example argue that development ideology is flawed as it “*represents the world as in a state of linear progression and change in which the North is ‘advance’ and the South locked into static traditionalism which only modern technology and capitalist relations of production can transform*”. Others argue that the approaches associated with the manner in which development was traditionally delivered (from a top-down perspective) caused the failure. Chambers (1993:9) for example states that top down approaches “often leave poor people out or make things worse for them”.

There are undoubtedly many other arguments as to why development appears to have failed. This study will however, focus on the ideology and approaches associated with development and this chapter aims to explore these issues in greater detail. It will briefly investigate the early origins of development and the modernisation and dependency theories associated with the ‘top-down’ approach. Reasons for the failure of the top-down approach will then be examined, followed by the paradigm shift that led to the emergence of ‘grassroots’ or ‘participatory’ development.

4.2 Early Origins of Development

Lewis and Gardener (1996) trace the origins of development as far back as 1700. They report that between 1700 and 1860 radical social and political change led to the undermining of feudalism in favour of ‘competitive capitalism’. The Enlightenment, saw the rise of science, technology and rational knowledge based on empirical information. Polarities between for example, ‘primitive’ and ‘civilised’, ‘backwards’ and ‘advanced’ developed which are argued to “have their contemporary equivalents in notions of undeveloped and developed” (ibid:4). In political terms, the Right was dominated with the classical political economy of Smith and Ricardo, while the Left was concerned with the historical materialism of Marx and Engels.

The neo-classical political economy and classical theories of imperialism dominated the period of 1860 to 1945. Gardner and Lewis (ibid) point out that changes in political and social sciences greatly influenced development practices at this time and into the future. For example, it was during this period that Darwin (1859) introduced the ‘Origins of Species’ and the concept of evolution, which was later applied to social organisation and led to the belief that societies

‘progressed’ in an evolutionary, linear manner. Durkheim (1893), in the ‘Division of Labour’ distinguished between ‘primitive’, ‘mechanical societies’ and ‘modern’, ‘organic societies’.

This period is also associated with colonialism and it is reasonable to argue that Durkheim’s theory may have contributed to the notion of the ‘complex’ colonial power bringing development, progress and social and political change to the ‘primitive’ people of the south. Political changes at this time were led by Marx and Engels, who believed that social change from one state to another occurred through a series of ‘modes of production’ ranging from feudalism to capitalism and finally to socialism (ibid.).

Over the last twenty or so years various theories have emerged regarding development. These include the theories of modernisation and dependency, which are associated with the ‘top-down’ approach to development and the market liberal and neo-populist approach, which are associated with ‘grassroots’ development. Each of theories and their relative successes and failures are explored below.

4.3 Modernisation and Dependency: The Top-Down Approach to Development

This section aims to critically examine the theories of modernisation and dependency. It will conclude that the ‘top-down’ ideology associated with these theories has often caused development initiatives to fail. Specific disadvantages associated with top-down development will then be examined in Section 4.4.

According to Sillitoe (1998) the modernisation theory is associated with the political Right and the dependency theory with the political left. Modernisation theories arose after the Second World War in a time of prosperity and growth in the North. It was an optimistic theory, based on western economic history, which assumed economic growth was easily attainable in all countries (Gardner and Lewis, 1996). It is based on the belief that the transfer of technology, industrialisation of production, commercialisation of subsistence agriculture and urbanisation would lead to economic development. Modernisation would occur as a uni-directional, evolutionary process, through an industrial revolution (Sillitoe, 1998). The poor and vulnerable would then benefit through a process of ‘trickle-down’ from the elite.

The dependency theory explains 'underdevelopment' in terms of political and historical structures and is influenced by Marxism (Gardener and Lewis, 1996). This theory is based on a 'core-periphery' model. In this model, Northern capitalist countries are at the core and exploit peripheral, ex-colonial countries in terms of maintaining the supply of natural resources needed to sustain the capitalist production system. Colonised countries of the south are perceived as being purposely underdeveloped so that they could operate only as suppliers of raw materials to the core rather than producing goods themselves (ibid.). This theory is also applicable at a national level with a relationship similar relationship existing between urban (core) and rural (periphery) areas. The root of underdevelopment is seen to lie in political structures and can only be solved through political restructuring rather than modernisation, which does not tackle the underlying causes of underdevelopment (ibid.).

Despite the fact that both theories originate from different political doctrines, Gardner and Lewis (1996:18) report that they have many similarities in that, *"both are evolutionary assuming that countries progress in a linear fashion and that it is capitalism which propels them from one stage to the next"*.

Modernisation theory has been criticised for many reasons. Sillitoe (1998) for example claims that it is state instigated and centrally managed. Development agendas are therefore implemented by technical experts and tend to be imposed on local communities without consultation. The importance of local people's opinions, knowledge or needs is unrecognised. Gardner and Lewis (1996) argue that indigenous practices and knowledge are assumed to stand in the way of development. This western ethnocentric theme is continued by the assumption that that countries of the South would, with an economic boost, follow the same 'blueprint' of modernisation as the North.

Dependency theory has also been criticised. Gardner and Lewis (1996:18) argue, for example, that *"one of the main problems with dependency theory is that it tends to treat peripheral states and populations as passive, being blind to everything but their exploitation"*. It does not, therefore, recognise that local people are capable of resisting, welcoming or indeed initiating change themselves.

Due to the nature of such theories, in which development is initiated by the state and where there is a failure to recognise the importance of local people's knowledge or capabilities, development can be described as top-down. This approach is examined in greater detail in the following section.

4.4 The Failure of the 'Top-Down' Approach

Top-down development initiatives are associated with many disadvantages, as indicated in the following list:

- Top-down projects tend to be centrally managed and funded. People involved in decision making are therefore often far away from the reality of the field situation, which results in inappropriate projects and decisions (Chambers, 1993).
- Top-down projects are often technology orientated and concerned with the 'transfer of technology' which is not always appropriate (Kiggundu, 1989).
- Top-down projects rely on scientific analysis in their formulation and largely ignore social issues. Leach and Mearns (1996) contend that this wrongly assumes that there is an external environment that is analytically separable from society. This prevents the holistic assessment of situations.
- Research stations tend to be formal and centralised, for example, they are often situated in areas where conditions are different to those in which rural farmer operates. The researcher may also have access to inputs that are not available to the poorer farmer, resulting in inappropriate results (Chambers et al, 1989).
- Top down projects are typically implemented without participation from local communities, who are largely ignored. According to Sillitoe (1998:16) this is due to local people being perceived as "*non-scientific, traditional and risk-adverse, even irrational and primitive*". Consequently, indigenous knowledge and traditional management systems are ignored and the real needs and problems of the local community may not be identified.

Disillusionment with top-down approaches to development has led to the introduction of new 'grassroots' theories in which it is envisaged that development can be delivered in a more effective, efficient and sustainable manner. These approaches are discussed below.

4.5 Towards Grass Roots Approaches

In the new development paradigm, two political polemics continue to exist between what Sillitoe (1998) describes as the politically Right ‘market liberals’ and the politically Left ‘neo-populists’. Both approaches will be examined briefly below. This will be followed by an investigation into the concept of participatory development, as it is arguably this ideology that reflects the real paradigm shift from the top-down to the grassroots approach to development.

The market liberal approach continues to be concerned with the transfer of technology from modern to developing countries. It is based on the assumption that the modernisation approach failed because the technology was inappropriate. It is believed that the development of appropriate technology, which can be maintained and used by local people, will lead to increased productive output, and therefore increased economic income and development.

The neo-populist approach probably represents the most significant change in the manner in which development is carried out. According to Sillitoe (1998), this approach rejects the state led ‘technocentric’ approach to development. Instead, the neo-populist approach introduces two aspects to development: ‘participation’ and ‘empowerment’. This approach is generally described as ‘participatory development’ and is examined in greater detail in section 4.6 below.

4.6 Participatory Development

Participatory development differs from traditional approaches in that it recognises that development is a process of continual adaptation in a changing environment. It also recognises that development should be ‘people centred’ and that rural people are knowledgeable and capable of self-reliant organisation. Finally, it promotes decentralisation and empowerment (Chambers, 1993:10-11).

Participatory development also attempts to move away from the dependency theory by attempting to work ‘with’ people to provide development that builds upon what local people know, rather than providing it ‘for’ them based only on what outside (usually Western) experts know. It therefore attempts to build capacity (local and national), drawing on existing indigenous knowledge.

Local knowledge is indeed considered to be crucial to the success of development projects and local people are encouraged to participate in all stages of the development process from project identification to evaluation. Mikkelsen (1995:61) presents a useful summary of participatory development, describing it as, “*involving local people in the selection, design, planning and implementation of programmes and projects that will affect them, thus ensuring that local perception, attitudes, values and knowledge are taken into account as fully and as soon as possible*”. It is perhaps this emphasis on integrating people into the development process that sets participatory development apart from top-down approaches.

Though empowerment is a central concept of participatory development, the degree to which empowerment is promoted varies between organisations, with some organisations advocating political empowerment while others promote personal empowerment by, for example, increasing knowledge through education.

Participatory development also uses a holistic approach rather than focusing on one aspect of a problem. This approach, according to Van Gelder and O’Keefe (1993:61) is more appropriate in addressing community problems as it “*combines social (human development), political (eradication inequality) and economic goals*”. Mikkelsen (1995:34) agrees with this, dismissing the ‘*grand development theory*’ in favour of ‘*discrete but interrelated development issues*’ that are to be understood in a ‘multidisciplinary perspective’.

Van Gelder and O’Keefe (1993:61) also state that “*participatory development by definition, should be a response to a problem that is voiced by an individual, a group or a community*”. It should not, therefore, be imposed upon people in order that the statistical requirements of donor organisations are met, thereby ensuring that funding continues.

Finally, for Chambers (1993) participatory development represents a move away from what he terms ‘normal professionalism’, where people use familiar methods that tend to be scientific, measurable and known, while rejecting anything outside these boundaries.

Participation therefore encompasses the following criteria:

- Clients are poor and deprived
- Location is in rural areas (for planning, research and implementation)
- Approach is holistic
- Technology is low
- Professionals are learners
- Poor people are knowledgeable and capable
- Aim is to empower local people
- Power and organisation are decentralised
- Locals participate in all stages of development (project identification, planning, implementation, monitoring and evaluation).

There are however, problems associated with participatory development, the main difficulty being that participation has become a development buzzword and according to Mikkelsen (1995:62) “the concept has become blurred”. Many organisations rhetorically state the need for participation, though in reality they do not adhere to the fundamental ideology of participatory development.

4.7 Summary

It has been argued that top-down development activities are centralised and implemented without community participation. Local knowledge and management systems are not considered, therefore activities seldom lead to sustainable outcomes. It was argued that participation of local people in all stages of the development process is critical to project success. Accordingly, development activities are more likely to succeed using a grassroots rather than a top-down approach.

One of the most important aspects of participatory development is that activities should be based on indigenous knowledge. The following section elaborates on the concept of indigenous knowledge, and the need to understand indigenous knowledge systems as a prerequisite for successful development activities.

5.0 INDIGENOUS KNOWLEDGE AND LOCAL PARTICIPATION IN COMMUNITY STUDIES

5.1 Indigenous Knowledge

Indigenous or 'local knowledge' is defined by Sillitoe (1998:3) as *“any knowledge held collectively by a population, informing interpretation of the world. It may encompass any domain, particularly in development currently that pertaining to natural resource management. It is conditioned by socio-cultural tradition, being culturally relative understanding inculcated into individuals from birth structuring how they interface with their environments”*.

In the past, indigenous knowledge has been largely disregarded by development practitioners. This has been for a number of reasons. According to Brokensha et al, (1980) indigenous knowledge is outside what is scientific, measurable and known. Chambers (1993:6) argues that there is a general belief among professionals that local people do not *“know anything of consequence”* because they are *“illiterate, of low status and poor”*. However, indigenous knowledge is presently gaining wide scale recognition and acceptance within the development community. This is due to increasing realisation of the following factors:

- Without insight into indigenous knowledge it is impossible to develop an understanding of the community and the existing problems and needs within that community.
- Insight into indigenous knowledge gives an understanding of what already exists in the community. Development activities can then build on these existing practices rather than introducing unfamiliar activities.

An understanding of indigenous knowledge is essential prior to the formulation of development activities, a fact that has been argued by anthropologists for a long time (Sillitoe, 1998). Gardner and Lewis (1996) state that *“understanding local culture is vital for more appropriate development projects”*. One method of gaining such knowledge is to conduct research activities with communities in areas targeted for development projects. Research activities should concentrate on the following issues:

- Indigenous knowledge and management systems (for example in relation to health, agriculture, and natural resources).

- Current problems and needs, strengths and opportunities within the community.
- Wider issues affecting the community (including political, socio-cultural and economical activities).

5.2 Local Participation in Community Studies

It is clearly important that local people participate in research activities. Local people are familiar with their environment and the circumstances in which they live and are therefore more able to identify their needs and problems. Accurate problem identification is essential to the success of development activities. Van Gelder and O’Keefe (1995:2) argue that *“to find a solution, the problem must be accurately located. Failure of any intervention is usually found in the initial misperception of the problem. If the basis of a solution (i.e. the location of the problem) is wrong, it obviously follows that any intervention will be misdirected”*. Mikkelsen (1995:44) states that *“dialogue is of particular relevance in connection with problem identification. The participatory perspective maintains that ‘problems’ are not to be defined by ‘experts’ but should be based on ‘dialogue’”*. Box 5.1 highlights how a lack of participation with local people can result in incorrect problem identification and project failure.

Box 5.1 The Woodfuel ‘Crisis’

The African ‘woodfuel crisis’ was identified through calculating the amount of woodfuel used by local people compared to the current standing stock of local forestry resources. This was combined with calculations regarding the amount of biomass needed to meet future demand (based on population growth projections). The resulting supply ‘gap’ led to a number of large-scale reforestation initiatives.

However, further analysis of woodfuel use indicated that local people were not responsible for the crisis. Local management practices involved removing dead branches or lopping activities rather than cutting down trees to procure fuel. The notion that the woodfuel crisis was caused by local people was therefore unfounded.

Additionally, calculations used to determine the remaining standing stock underestimated the amount of small trees, bushes and shrubs that are used by local people. Such trees may be hidden under the forest canopy during aerial surveys or simply classed as useless by traditional foresters. Finally, the coping mechanisms of local people to fuelwood shortages were ignored. It was assumed that local people would not attempt to manage or solve fuelwood shortages themselves.

Communication with local people led to an understanding of local knowledge and management systems. It was then apparent that the woodfuel crisis existed only in terms of abstract population and forest resource projections. Evan-Mercer and Soussan (1992:177) report that the miscalculated projections and wrongly defined woodfuel crisis *“led to projects that sought to boost fuelwood supplies without regard to local needs, priorities or resource potentials – or to the economic viability of the plans”*. This case study clearly highlights the dangers associated with top-down analysis that ignores indigenous knowledge and local participation.

After Leach and Mearns (1988)

Leach and Mearns (1996:3) have examined issues such as the ‘woodfuel crisis’ in relation to ‘received wisdom’. They claim that accepting received wisdom “*obscures a plurality of other possible views and often leads to misguided or even fundamentally flawed development policy*”. Carrying out community studies is one method by which received wisdom can be challenged. As Mikkelsen (1995) indicates “*researchers distinguish themselves not by confirming conventional wisdom, but by questioning it*”.

5.3 Summary

It has been argued that development is more appropriate and effective when associated with a participatory approach. Accordingly, participatory community studies are necessary so that indigenous knowledge can be understood prior to the introduction of development activities. The following section examines the different types of methodologies that can be used in community studies.

6.0 METHODOLOGIES, TECHNIQUES AND NHAMBITA STUDY

6.1 Methodologies for Community Studies

Clearly, the type of methodology selected to gather community information is very important. It is essential that the methodology selected will facilitate the following:

- The collection of data appropriate for its intended use.
- The collection of data in an effective and efficient manner in terms of both cost and time.
- The collection of data in a manner that promotes participation with the local community.

For the purpose of this study three distinct types of methodology will be investigated. These are as follows:

- Questionnaires surveys
- PRA/RRA techniques (PRA and RRA are investigated together in this section as there are many similarities in the techniques used).
- Anthropological studies

The aim of this section is to examine each of these techniques individually, including the methodologies and associated advantages and disadvantages. Initially, a brief discussion regarding quantitative and qualitative information will be presented. This will be followed by a review of the respective time-scales associated with each technique. Finally, the methodology selected for the Nhambita study, a combination of each of the above techniques, will be presented and discussed.

6.2 Qualitative versus Quantitative

One of the major distinctions between the methodologies mentioned above is that each produces a different type of information. PRA, RRA and anthropological techniques generally produce mainly qualitative information and questionnaires generally produce quantitative information. There are however, ongoing debates regarding the acceptability of each type of information within the social

science discipline and these debates are the result of a long history of differentiation between the natural and social sciences.

The debate about quantitative and qualitative methods of data enquiry extend back through the history of the development of natural science (e.g. physics, chemistry, mathematics) and the development of social science (e.g. sociology, psychology, anthropology). Detailed exploration of these issues is complex, detailed and outside the remit of this work. Scientific acceptability was however considered when selecting methodologies to use in this study and in order to provide sufficient background to this issue, a brief presentation of the main arguments is given below.

Russell Bernard (1995:3) states that science is “*an objective, logical, and systematic method of analysis of phenomena, devised to permit the accumulation of reliable knowledge*”. Each scientific discipline has an individual methodology with acceptable methods for collecting and processing information. Both natural and social scientists tend to use empirical information to further their knowledge base however, the method in which analysis of phenomena takes place differs between the disciplines. Natural scientists tend to use positivist, deductive methods of enquiry (which are mathematical and quantitative), and social scientists generally tend to use empiricist, inductive methods that are based on experience. The debate is essentially focused on whether the empiricist techniques used in social science, which are generally considered qualitative and subjective, can produce information that is as scientifically valid as that produced from positivist, quantitative enquiry.

Empiricism, according to Russell Bernard (1995:2) is as old as ancient Greek philosophy and argues that “*the only knowledge that human beings acquire is from sensory experience*”. Knowledge therefore stems from empirical observation and experience, and growth in knowledge comes from induction or “*the use of direct observation to confirm ideas, linking together observed facts to form theories or explanations of how natural phenomena work*”. Observation therefore occurs first and takes priority over scientific proof, logic and the development of theory. The data collected for this type of enquiry is generally considered to be qualitative.

Positivism, (usually known as logical positivism) was defined in the 1920s and 1930s by the Vienna Circle. It was developed initially by Auguste Comte in the nineteenth century and is based on the collection of empirical data combined with reason, logic and scientific proof made available

through measurement. It is concerned with the discovery of universal truths. Knowledge in this case is gained through deduction, a process of reasoning by which a specific conclusion necessarily follows from a set of general premises. According to Russell Bernard (1995:11) “*the so called positive stage of human knowledge is reached when people come to rely on empirical data, reason and the development of scientific laws to explain phenomena*”. Data generated through positivist enquiry is driven by a theory, which is developed prior to data collection. The data generated in this type of enquiry is generally quantitative and aims to test the theory.

Natural scientists tend to use positivist enquiry in order to further their knowledge base. Their reliance on mathematical, quantitative methods is emphasised by Pepper (1984), who argues that what is mathematical is taken to be fact and is real. Simultaneously, something can only be real and factual if it is mathematical. Thus, the outcome of physical experiments tends to be constant. For example, at a given temperature and pressure water will boil. Such an experiment can be replicated and the result will continue to be the same. The result does not rely on human interpretation it relies on measurement.

Moris and Copestake (1993:3) draw the distinction quite clearly between empirical and positivist approaches, arguing that empirical, qualitative research involves “*becoming immersed in the primary data before the investigator formulates an inductively derived picture of a specific situation, institution or system*”. Knowledge is therefore derived from experience rather than scientific proof, logic or theory. Conversely, positivist, quantitative information “*is obtained through empirical measurements, which are analysed within the framework of a deductively justified methodology*” (ibid:3-4). This knowledge is therefore derived from reason, logic and scientific proof.

In social sciences, however, it may not always be possible to apply positivist methods of enquiry to the study of human behaviour. This is for several reasons. Initially, human behaviour is not predictable, mechanical or uniform. Nor is it always logical: people do not respond in an identical manner to identical situations. It is therefore difficult to generate universal laws or generalisations. Additionally, research in social science may not be replicable, therefore it is not always possible to carry out further experiments to validate results.

It is also debated whether it is possible to carry out social research in a completely objective manner. The researcher may find it difficult to interpret and analyse events outside their own socio-cultural experiences and interpretations.

Finally, social enquiries may also involve investigation into phenomena that are not easily measurable, but may rely on experience, interpretation and therefore judgement. This could involve the interpretation of smells, tastes and colours which are not recognised as 'real' or 'true' interpretations, but may be considered as secondary qualities which can not be formally measured. They are therefore considered to be subjective opinions rather than objective fact (Pepper, 1984). In other words, social enquiry relies to a large extent on empiricist approaches, phenomenological and interpretative studies and qualitative information rather than positivist, quantitative information.

As a result social science is considered by some to be less objective and therefore less 'scientific' than natural science. Moris and Copestake (1993:1) argue that "*qualitative information is generally thought of as subjective, verbal and descriptive; in contrast to quantitative information which is objective, numerical and amenable to mathematical analysis*". The approaches of qualitative enquiry are criticised as they "*use a more passive approach where information is collected through experience, observation of events directly or listening to others as they talk about them*" (ibid:4). They continue, stating that "*numeric is considered by experimental scientists to be more objective and hence more replicable than other forms of enquiry. It is less ambiguous*" (ibid:5).

The argument is not however clear-cut. Initially, many social scientists do not agree with the criticisms of natural scientists. May (1997:10) for example claims that social science is amenable to positivism, the positivist aim being "*to collect and assemble data on the social world from which we can generalise and explain human behaviour through the use of theories*". Objectivity results from the detachment of the investigator and the rigorous collection of empirical data from accurate tools which then generate a set of "*'true', precise and wide ranging 'laws' of human behaviour*" (ibid.).

Others do not accept that qualitative information is less scientific than quantitative. Mikkelsen (1995:34) for example, argues that "*qualitative information can be as scientific as quantitative data and is often more valid*".

In response to accusations of lack of objectivity in social science, May (1997) argues that objectivity may be difficult to achieve in quantitative approaches to science as well as qualitative. This is because there may be different perspectives on any given phenomenon preventing consensus of opinion and therefore questioning the objectivity of all science. Alternatively, it is argued that a certain amount of subjectivity cannot be avoided in producing qualitative data and is acceptable if the biases are recognised, made clear and reduced as much as possible by the researcher. May (1997:153) argues that “*the idea of disengagement to produce ‘untainted data’ is something of a myth and is based upon a particular view of ‘scientific procedure’*”.

However, even within the discipline of social science there are different opinions regarding the value of qualitative and quantitative methods. Mikkelsen (1995:224) for example, states that “*controversies have raged over the justification for using qualitative methods in social research*”. Attempts were traditionally made to produce positivist, scientific studies of social phenomena through for example, the use of questionnaire studies, which were the common tool of positivist social scientists. If carried out rigorously, questionnaires can produce information that is amenable to scientific analysis, producing quantifiable results in a relatively objective manner.

Information such as anthropological techniques and later PRA and RRA were, on the other hand, traditionally considered to produce qualitative data. However, there is a wide range of variability in each of these categories and many techniques are also amenable to positivist quantification if necessary. For example, such techniques may incorporate measuring, ranking, scaling and the use of indices, thereby facilitating quantification. Also, it is feasible, in certain instances, to transform information that is initially produced in a qualitative manner into quantitative data at a later time during the enquiry. In this case Moris and Copestake (1993:4) argue that “*quantification occurs when measurement is introduced*”. For example, the measurement could involve merely counting some presence or absence trait in the data.

The range of methodological techniques available to the social scientist is therefore large, with each technique providing different types of information ranging from empirical, qualitative data to positivist, quantitative data. This range of techniques is perhaps one of the strengths of the discipline. Perhaps the most important aspect to consider when contemplating qualitative, quantitative or other methods of enquiry is that the type of investigation conducted should lead to

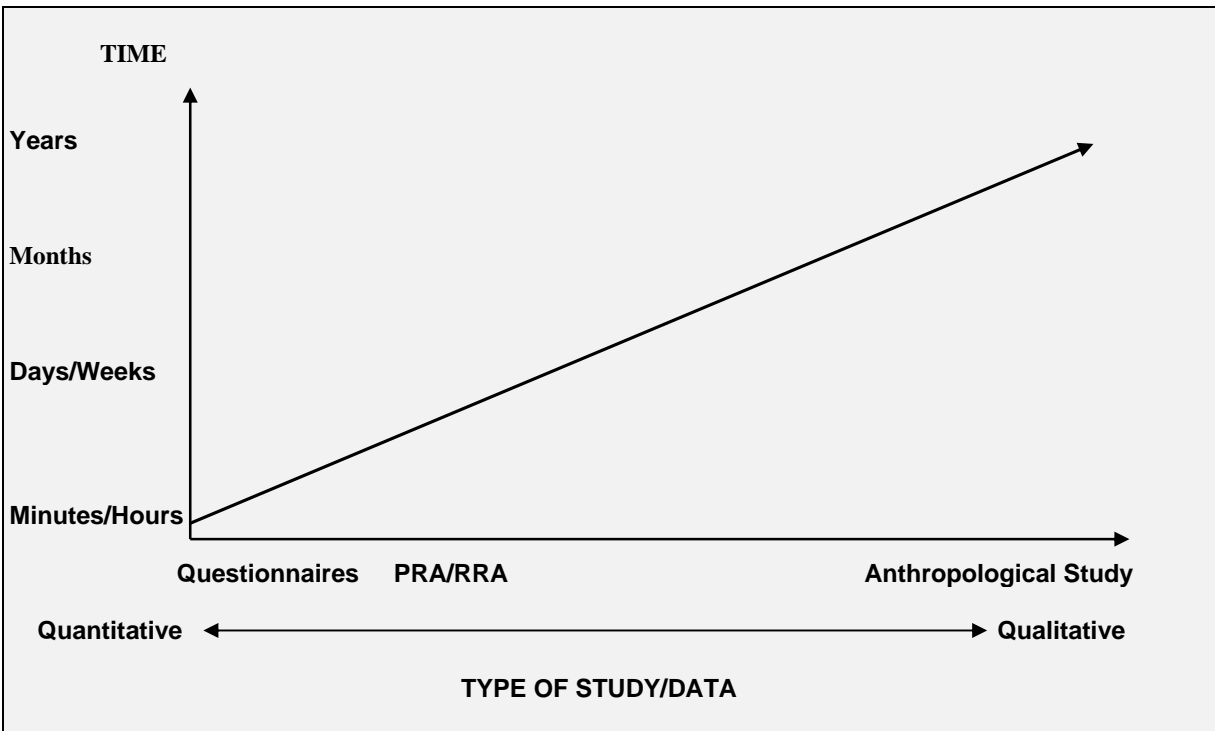
the production of data that is appropriate for its intended use. Additionally, production of excess data is an inefficient use of resources and can obscure the issue under investigation.

Finally, it should be remembered that in the context of development, empiricism and positivism are not the only approaches, nor necessarily the best approaches for research. Mikkelsen (1995:34) argues that “*development studies need not necessarily apply the research principles of the natural sciences: causality, objectivity, predictability, quantification etc. Interpretative iteration is accepted as a valid research method*”. This highlights the fact that different approaches using different methodologies can be considered to be scientifically acceptable. It is not necessary to adhere to a positivist or empiricist position. Interpretative iteration is only one of these approaches; others include realism, idealism, postmodernism and feminist approaches to research, each of which uses and accepts different methodologies to produce what is considered as scientific knowledge within their discipline.

6.3 Type of Study According to Time Available

A further distinguishing feature in each of the studies mentioned above, is the amount of time taken to complete each study within the community. This is important, as the amount of time spent with each community may affect both the quality of data and logistical inputs needed. Figure 6.1 shows a simplified, diagrammatic generalisation of the time taken in a community to complete each type of study. The type of data produced (qualitative or quantitative) is also indicated.

Figure 6.1 Different Time Scales Associated with Individual Studies



Source: Adapted from Convery and Howell (1997)

As can be seen from the table above, questionnaires, which generate the most qualitative data, are generally relatively quick to complete with the researcher spending a maximum of around an hour to complete each pre-prepared form. With a team of researchers, information can be collected within a community very quickly, usually within a matter of days or weeks. The person compiling the report need not even visit the research community if the team carrying out the questionnaires is suitably trained.

PRA and RRA techniques, which generate a mix of quantitative and qualitative data, take longer as they are associated with community meetings, in-depth interviews with individuals, indicator measurements and observation of the community and environment. Studies can still be completed relatively quickly however, taking generally a number of days or weeks. In this case there is a greater need for the person writing the report to visit the community as the results are based to a certain extent on the interpretation and observations of the researcher.

Anthropological studies however, which traditionally produce mainly qualitative information, can be very time-consuming and in some cases can take years to complete. The person writing the

report must be the person who has performed the research in the field as the detailed observation and interpretation over a long period is critical to the accuracy of the report.

In addition to the varying types of information that can be gathered through each technique and the varying length of time spent carrying out the research, there are many other differences, advantages and disadvantages associated with each technique. The following section aims to explore these issues in greater detail.

6.4 Questionnaires

In social enquiry, the traditional technique used and the technique most often associated with the production of positivist, quantitative information is the survey (Bryman, 1989). Surveys can be carried out through observation only (for example of traffic), though most often involve the use of questionnaires where people are directly questioned about a certain issue or activity. Robson (1993:49) describes a survey as *“a collection of standardised information from a specific population, or some sample from one”*.

Generally, a small amount of information is collected about a specific subject during a short interview, either with a family or with individuals from the specific population or sample population. Bryman (1989:104) goes on to state that the *“quantifiable data...are then examined to discern patterns of association”*. The interest *“is not normally on individuals per-se, but on profiles and generalised statistics drawn from the total sample and generalised to the population”* (Robson: ibid.). The data collected from the sample is therefore extrapolated and taken to be representative of the population of the survey area.

The questions that are asked during questionnaire interviews are prepared in advance by the research team with each possible answer being categorised (or codified) in order that it can be analysed after completion. Typically, specific closed question are asked that aim to generate definite ‘yes’ or ‘no’ answers. Robson (1993:125) argues that *“if the questions are incomprehensible or ambiguous, the exercise is obviously a waste of time”*. Data is then analysed using various statistical tests based on the response to each question. This produces specific

quantitative data about each question. For example, a particular figure can be given to indicate the number of children within the sample (and therefore the population) who attend school.

In carrying out questionnaires, the sampling strategy is of importance. Robson (1993:126) argues that *“if the sampling is faulty, this produces ‘external validity’ problems such that we can’t generalise our findings”*. Usually, the sample respondents *“are almost always selected as a representative sample from some larger population”* (ibid:31). The sample size depends ultimately on the type of investigation needed and the level of variability within the group to be studied. Groups with large variability requiring a greater sample size and vice versa. Knowing the size of the sample allows the researcher to calculate the probability of each person in the area being selected to fill in the questionnaire. This is known as ‘probability sampling’. Probability sampling techniques include simple random sampling (where the sample is selected at random from the population), systematic sampling (selecting for example every tenth family or individual), and cluster sampling (where the population is broken into representative clusters and the survey takes place within one randomly selected cluster).

When the sample size is unknown the sample is called a ‘non-probability sample’ and involves the researcher using personal judgement to achieve a particular purpose. This type of study is not appropriate for statistical analysis. Other methods of sampling include, quota sampling where a quota of certain categories of are required and convenience sampling, where the nearest and most convenient group act as respondents. This method is criticised and being a *“cheap and dirty way of doing a sample survey”* by Robson (1993:141).

Questionnaire surveys have advantages and disadvantages. For some, questionnaire surveys are considered to be the central strategy in collecting scientific, reliable, quantitative information in a short amount of time. Robson (1993:126) argues that reliability can be achieved by *“presenting all respondents with the same standardised question, carefully worded after piloting”*. Additionally, the information produced from surveys is relatively easily understood and useable. Transparency or accountability is also argued to be high as methods and procedures used to gather information can easily be made available (Hakim, 1987).

However, many people argue against questionnaire surveys because of the nature of information that is produced and inflexibility of techniques. Moris and Copestake (1993:1) for example, report

that “*information is codified very early which permits rigorous statistical analysis, but at the same time entails introducing restrictive assumptions which limit the range of possible findings*”. Consequently, “*subsequent interpretation is severely constrained by the assumptions employed in the initial reduction of data to numeric form and depends heavily upon the mathematical rules governing how such information can be treated and interpreted*” (ibid:4).

Additionally, Moris and Copestake (1993) argue that while closed questions are the least ambiguous, they are also most intrusive and do not allow for adequate explanation of the “*yes, but...*” answers which are so typical of the replies to many questions. Robson (1993:50) sums up questionnaire surveys succinctly, stating that “*this type of study is dependent on the quality of individual responses and there is legitimate scepticism about whether or not the perfunctory survey responses carry real meaning*”.

Questionnaire surveys can also be criticised due to their extractive nature. Information provided by an individual is usually taken away, processed and used in a manner to which the individual is not privy. The interviewee is unlikely to even receive feedback from the study. The process of carrying out questionnaires can therefore be described as one-way, with the researcher benefiting and the interviewee gaining nothing.

The practical advantages and disadvantages of questionnaires as a methodology are presented in greater detail in Table 6.1.

Table 6.1 Advantages and Disadvantages of Questionnaires

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Short time scale 	<ul style="list-style-type: none"> • Viewed as ‘development tourism’. Brief visit by urban professional and extractive nature of contact. One-way movement of information. • Minimal contact with community. Lack of cultural understanding. No time to develop insight into ‘etic’ and ‘emic’. • Feared by local community (may appear to be checking up, causes suspicion, leads to altered behaviour and unreliable information). • Lack of time to build up trust and confidence from community. People may respond so that they look favourable rather than present the truth. • No time for cross-checking of data or observation of the community within a ‘normal’ setting. Can not identify difference between what people say and what they do. • Minimal amount of information collected about a specific topic, may be out of context. • Data processing can be time consuming
<ul style="list-style-type: none"> • Low cost 	<ul style="list-style-type: none"> • Potential poor quality of data (lack of cross-checking, trust and observation).
<ul style="list-style-type: none"> • Easy to use techniques 	<ul style="list-style-type: none"> • Inflexible, rigid approach which has a specific agenda so no opportunity to explore or other important issues. • Must anticipate problems in community in order to prepare of questions for questionnaires in advance of survey. The agenda is therefore set by the researcher according to the researcher’s interpretation of reality. • Early codification leads to restrictive assumptions in terms of available answers
<ul style="list-style-type: none"> • Minimal training needed 	<ul style="list-style-type: none"> • Low level of skill share to researchers.
<ul style="list-style-type: none"> • Easier to cover large areas 	<ul style="list-style-type: none"> • Vulnerable groups may be omitted. • Different areas may vary greatly and have different problems. Questionnaires may not be area specific.
<ul style="list-style-type: none"> • Quantifiable data with acceptable scientific methodology 	<ul style="list-style-type: none"> • Unreliable data (lack of cross-checking, observation and trust). • Lack of depth to data, ‘yes’ or ‘no’ answers are not always applicable and may miss the most important problem as perceived by the local community. • Reliability of data relies on selecting a representative, non-biased sample.

Source: Adapted from Convery and Howell (1997)

6.5 PRA and RRA

As the top-down approach to development was replaced by the grassroots approach, new methodologies were developed which would allow the researcher to explore local knowledge and *“off-set the anti-poverty biases of rural development tourism...and...the many defects of large questionnaire surveys”* (Chambers, 1993:97). The result was the introduction of RRA and later PRA. According to Mikkelsen (1995:67) *“PRA and RRA came into being at a time in the late 1970’s when it became increasingly difficult to ignore the possibility that there might be something fundamentally wrong with the way development had been conceptualised, planned and implemented. PRA and RRA were developed in response to the disappointments and the criticism of the assumptions upon which earlier development work was based”*.

RRA involved the development of a new set of methods in social investigations. It is concerned with gaining insight and information from rural people about rural conditions in an effective, inexpensive and timely manner (Chambers, 1993). The research is still considered to be somewhat extractive as the researcher continues to be an urban professional and data is removed from the area for external analysis. Many practitioners consider the term RRA should thus be used for data-collecting activities, topic investigation and research (ibid). RRA involves a large amount of independent observation of the community and environment, in addition to interviews and group meetings.

PRA developed from RRA and effectively added the notion of participation to RRA. Through the addition of participation, PRA enquiry adhered to the fundamental principles of participatory development. Emphasis was placed on local people’s capabilities and enabling them to *“conduct their own analysis, and to assert their own priorities”* (ibid:98). Local people therefore act as research partners assuming the role of teachers and analysts while the researcher assumes the role of pupil.

The emphasis on capability reflects the perceived need to empower and build capacity within vulnerable groups, thus providing the basis for self-mobilisation and community management. In this situation the professional acts as facilitator and in effect ‘passes the stick’ to members of the local community so that the local community become the analysts of their own situation (ibid.). It is

therefore argued by Chambers (ibid.) that the term PRA should be reserved for on-going empowerment processes involving appraisal, analysis, planning, action, monitoring and evaluation.

Though PRA originally appeared as a component of RRA it has become a separate, individual technique with unique methodologies. The two techniques however, still share some common approaches and are often used simultaneously. RRA and PRA have been distinguished as overall approaches rather than methods. According to Mikkelsen (1995:67) PRA and RRA represent “*a reorientation in the relationship between the outsider and the subjects of development activities and research: i.e., a reciprocal learning process in the relationship has replaced the one-way ‘transfer of know-how’ idea*”.

The objective of RRA and PRA fieldwork is to generate discussion through interviews and meetings, which may be held with members of the community in general or specific groups such as women, men or elders. As interview questions and discussion topics are open-ended rather than closed, discussion is generated and a greater depth of information is gained which may occur when using questionnaires, where the objective is a simple ‘yes’ or ‘no’ answer. In addition, the topic of discussion is flexible, and can therefore change to reflect specific issues that are important to the local community.

In relation to PRA, Mikkelsen (1995:70) argues that ‘*invention*’ used to create dialogue and collect information is one of the overruling principles. Flexibility and imagination are needed to carry out successful PRA as the issues to be explored will differ according to each group, even within the same community. There are many different activities that constitute PRA many of which can be found in what is known as the ‘PRA Toolbox’ (FAO, 1989). However, new activities are constantly being developed to meet the needs of different situations. The phrase ‘use your own best judgement at all times’ is often heard in conjunction with methods carrying out effective PRA. Table 6.2 indicates examples of some of the differing methodologies of PRA and RRA, while Table 6.3 indicates some of the shared principles of PRA and RRA.

Table 6.2 Selected Approaches and Methodologies of PRA and RRA¹

RRA	PRA
<ul style="list-style-type: none"> • Secondary data collection: <ul style="list-style-type: none"> * Reports, articles, books * Maps * Aerial photography * Satellite imagery * Photographs * Folklore (mythology, poetry, proverbs) • Observation • Verbal interaction • Semi-structured interview • Focus groups • Key Indicators • Asking experts • Case studies • Transect drawing, soil analysis, tree identification 	<ul style="list-style-type: none"> • Shared visual representation and analysis by locals: <ul style="list-style-type: none"> * Mapping: * Modelling * Listing * Sequencing * Comparing * Scoring * Ranking • Time-line, trend and change analysis • Seasonal calendars • Daily time-use analysis • Shared presentation and analysis • Participatory planning • Drama, games and role play • Life histories • Gender analysis • Spidergrams

Source: Adapted from Chambers (1993, p.97-8, 1997, p)

¹ For many authors the distinction between activities that are considered PRA and activities that are considered RRA is not clear. For example, secondary data collection is considered by some as RRA while Mikkelsen (1995:71) considers it to be PRA. For the purpose of this study the distinction lies in whether the activity is community led (PRA) or led by the researcher (RRA). This is not completely accurate however as PRA sessions planned (and with the agenda set) by the researcher may still be directed to some extent by the researchers regardless of whether the community are 'holding the stick'. This is especially so in the initial stages of enquiry when PRA is an unknown method and the community are not familiar with the techniques.

Table 6.3 Shared Principles of PRA and RRA

Reversal of learning	Learn from local people on site. Face-to-face. Gain from local technical, physical, social knowledge.
Learning rapidly and progressively	Inductively, flexible methods, improvisation, iteration and cross-checking. Not following a blueprint but adapting a learning process.
Offsetting biases	Opposite to development tourism. Being relaxed, not rushing, listening not lecturing, probing instead of ignoring difficulties. Being unassuming rather than important and arrogant. Seeking out vulnerable groups. Learning concerns and priorities.
Optimising trade-offs	Relating cost of learning to useful truth of information. Trade-offs between quantity, relevance, accuracy and timeliness. Optimal ignorance – knowing what is not worth knowing. Appropriate imprecision – not measuring more than needed.
Triangulation	Using a range of methods to cross-check information.
Seeking diversity	Seeking variability rather than averages. Deliberately looks for and investigates contradictions.
Additionally for PRA	
Facilitating (they do it)	Facilitate investigation, analysis, presentation and learning by people themselves. They present outcomes and learn. Interviewer starts process and sits back to listen.
Self critical awareness	Facilitators try to improve their own activities and embrace and learn from errors. Using own best judgement at all times, so accepting responsibility for errors.
Sharing information	Between rural people, facilitators and other organisations.

Source: Adapted from Mikkelsen (1995:69-70)

The following table shows a simplified summary of the various disadvantages and advantages common to both PRA and RRA. Notes are added where specific advantages and disadvantages apply to only one technique.

Table 6.4 Advantages and Disadvantages of PRA and RRA

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Cost effective. Large quantity of relevant information gathered in relatively short space of time. Time scale is however increased compared to time taken for questionnaires. 	<ul style="list-style-type: none"> • Time scale may be inadequate to generate high levels of trust and confidence. • The relatively short time scale may be insufficient for detailed observation of activities and cross-checking of information. (RRA continues to be criticised as development tourism).
<ul style="list-style-type: none"> • Can produce better quality, reliable data. This due to increased input from community therefore increase level of indigenous knowledge. The community can also identify their own problems and needs producing a more accurate assessment than an external researcher could make. Increased community contact also allows a degree of trust and co-operation to develop. 	<ul style="list-style-type: none"> • Data analysis problematic may be difficult to quantify information. May be unacceptable as scientific method.
<ul style="list-style-type: none"> • Increasingly representative (vulnerable groups can be identified and approached separately). 	<ul style="list-style-type: none"> • Group meetings may continue to be dominated by wealthy/powerful. They are likely to be the ones 'holding the stick'
<ul style="list-style-type: none"> • Varied, appropriate, non-intimidating, techniques using few, if any, resources. Relatively non-intrusive techniques 	<ul style="list-style-type: none"> • Some techniques may be considered condescending. • Techniques may not be understood by local community. • Introduces a different method of enquiry to locals with which they are unfamiliar.
<ul style="list-style-type: none"> • Increased skill share for researchers. 	<ul style="list-style-type: none"> • More training required than for questionnaires.
<ul style="list-style-type: none"> • Flexible techniques: can be developed or changed on the spot to suit the situation. Allows local people to discuss topics that are of importance to them. 	<ul style="list-style-type: none"> • Not subtle (as with indirect observation). • Agenda still initially set by researcher therefore topics for exploration still defined according to researcher's interest and interpretation of reality.
<ul style="list-style-type: none"> • Empowerment of local people so that they can build capacity and identify and manage their own problems. 	<ul style="list-style-type: none"> • Creates potential conflict situations in areas outside the remit of the organisation. • Assumes local people want to be empowered • Concept of 'handing-over the stick' may be difficult to introduce.

Source: Adapted from Convery and Howell (1997)

6.6 Social Anthropology

Anthropology is concerned with understanding the behaviour of others. According to Seymour-Smith (1986) social anthropology encompasses the study of concepts such as society, social structure and social organisation. Evans-Pritchard (1951) extends this definition arguing that the discipline studies *“social behaviour, generally in institutionalised forms, such as the family, kinship systems, political organisation, legal procedures, religious cults...and the relations between such institutions; it studies them either in contemporaneous societies or in historical societies for which there is adequate information of the kind to make such studies feasible”*.

The traditional methodology used to collect information in social anthropology is known as ‘participant observation’. Russell Bernard (1995:137) describes participant observation as *“establishing rapport in a new community; learning to act so that people go about their business as usual when you show up; and removing yourself every day from cultural immersion so you can intellectualise what you’ve learned, put it into perspective, and write about it convincingly”*. One of the first things that this involves for the researcher is learning the local language in order that the researcher can participate in community activities. According to Russell Bernard (ibid.145) *“unless you are a full participant in the culture you’re studying, being a participant observer makes you a freak”*.

When using participant observation, there is a distinction, as noted by Russell Bernard (1995) between the ‘participating observer’ and the ‘observing participant’. The participating observer lives within a community for a substantial period of time (usually about a year), becomes immersed in the local culture, food and language, but remains an ‘outsider’ and maintains an ‘objective distance’ from which to observe. The observing participant on the other hand becomes a part of the community in which the research is being performed and becomes directly involved in the issue that is the focus of the study. In other words the researcher ‘goes native’ (Russell Bernard, 1995), or ‘becomes the phenomenon’ (Jorgensen, 1989).

Techniques that are used when carrying out participant observation are numerous and include structured, semi-structured and unstructured interviews, direct and indirect (unobtrusive) observation and the use of case study material. Key informants are often used to provide information on certain topics of which they have much experience, knowledge and competence.

Aspects of measurement can also be introduced to participant observation in order to provide data that is amenable to quantification. The main method of recording information, however, is through regularly updated field notes, which may be analysed both in the field and on completion of the fieldwork. Analysis of data in this manner provides flexibility in the field. In addition, material may also be collected and recorded on audio-tape, video-tape, in photographs, on transcriptions and notes from interviews, newspaper clippings, personal letters and texts written by local people about their lives (Russell Bernard, 1995).

The aim of anthropological information is to allow the researcher to develop an ‘actor-oriented’ perspective that provides a valuable entry point and a ‘way of seeing’ that is appropriate to a specific community. This involves distinguishing the ‘etic’, or outsider’s mental framework, from the ‘emic’ or local, insiders understanding. Table 6.5 indicates the advantages and disadvantages associated with anthropological techniques.

Table 6.5 Advantages and Disadvantages of Anthropological Techniques

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Long time duration. Provides adequate opportunity to cross-check through observation and allows trust and confidence to develop between community and researcher. 	<ul style="list-style-type: none"> • Long time duration may be unfeasible prior to urgently needed development initiatives. • High cost for long fieldwork duration.
<ul style="list-style-type: none"> • High quality, reliable and detailed information. Long time duration in field and good relationship with community provides depth, quality and reliability to information. Also permits a holistic study of the community. 	<ul style="list-style-type: none"> • Information may be more detailed than necessary.
<ul style="list-style-type: none"> • Training of one person only (though intensive). 	<ul style="list-style-type: none"> • Low skill share.
<ul style="list-style-type: none"> • Qualitative, reliable and detailed information. Can be analysed in field. Flexibility of techniques allows study of subjects that may not have been anticipated prior to fieldwork. 	<ul style="list-style-type: none"> • Information may be difficult to quantify. • Information may be analysed in a subjective manner, as objectivity is lost due to the length of field experience. • Information specific to one community, difficult to extrapolate information to other communities or generalise, so result is a very detailed account of one area only.

From this section, it can be seen that the three techniques of data collection that have been explored in this section are very varied. Each methodology facilitates the collection of a different type of data and has varied associated advantages and disadvantages. The following section presents the methodology that was used in the collection of data in Nhambita.

6.7 Methodologies Used in the Nhambita Study

The methodology selected for the study in Nhambita needed to provide data that was appropriate both to inform policy and lead to the introduction of small-scale development projects. It was concluded that in isolation, none of the techniques discussed above would be adequate to produce such data. For example, it was thought the questionnaires alone would not give the level of depth that was needed in the data, it would not for example allow an exploration into people's feelings regarding the national park. Nor would questionnaires be flexible enough to explore other issues that were important to the local community and had not been anticipated prior to the study. Cross-checking of data through observation of activities would also not be possible if questionnaires were the sole method of inquiry.

PRA and RRA alone would not provide the level of quantitative data required for policy making and would not allow for cross-checking and triangulation of information through detailed observation. An anthropological study using participant observation over a long period of time was impossible mainly due to the limited time scale that was available to collect the data. In addition the amount of quantitative data would be limited.

In order to address this problem a methodology was devised which involved a combination of each of the above techniques. This methodology was selected in recognition of the advantages and disadvantages of each technique. Some slight alterations were made in some of the techniques. For example questionnaires were not completed in the traditional manner (see below). This was an attempt to maximise the advantages of each technique and minimise the disadvantages.

The aim of this combined methodology was to produce both quantitative and qualitative data. This combination would allow triangulation of data and therefore more accurate results. It was envisaged that such a methodology would lead to a more accurate, holistic understanding of the

community. It would also lead to identification of the community's needs and problems, as they are actually perceived by the community rather than the researcher.

This also facilitated the production of appropriate data for the Wildlife Management Component. This would assist in the formulation of a management strategy for the buffer zone of GNP and the identification of small-scale development initiatives.

A more detailed description of the methodologies that were used in the study is as follows:

- **Participant Observation** – This involved the research team living within the community, situated on the homestead of the *Regulo*, for a period of four weeks². During this period the researcher adopted the role of both the observing participant (generally observing *machamba* life, walking to the mill and health centre, water hole and sacred sites) and the participant observer (becoming involved in *machamba* activities). Direct and indirect observation was carried out at all times. Interviews and observations were recorded in full detail at the soonest opportunity after the interview was terminated and a diary of events was maintained. Information was collected, for example, regarding hunting practices and daily activities. Participant observations were also combined with measurements of fuelwood use by the community. GPS measurements were recorded to indicate distances to resource collection sites and services.
- **Participant Rural Appraisal (PRA)** – This involved group meetings with different members of the community including women, men and elders, both as separate groups and communally. Meetings were also held with individual men and women or families. Activities which were used include: spidergrams, resource mapping; seasonal calendar; timetable of daily activities; timeline; gender division of labour; farming systems analysis; scoring; ranking and shared presentation and analysis.

² The research team included myself (as GERFFA socio-economist), one independent researcher and two translators/assistants. The translators spoke Portuguese and some Sena and were provided by GNP rather than selected. Both had knowledge of the local flora and fauna. They were instructed in translation techniques and questionnaire methodologies and after an initial period of supervision carried out questionnaires independently.

- **Rapid Rural Appraisal (RRA)** – This activity commenced prior to the fieldwork with an extensive background study of existing reports and maps. During fieldwork, RRA focused on a combination of activities, some of which were carried out independently and others that were carried out with members of the local community. Activities included observation both of social activities and the local environment, transect drawing, soil analysis and tree identification, aerial and terrestrial photography and the identification and measurement of key indicators relating to health. This involved the collection of medical statistics from the health post and anthropometric measurements of children and adults. In-depth structured and semi-structured interviews were held with the *Regulo*, *Chiefs*, *M'fumos*, the traditional healer and health post staff and individual women and men.
- **Questionnaires** – Questionnaires surveys were performed in each zone of the *Regulado*. One questionnaire was completed for each family and a total of 43 questionnaires were completed, accounting for approximately 42% of the population. The questionnaires used differed however, from the traditional technique in that it was flexible and became open-ended and exploratory with certain interviewees. This reduced the inflexibility normally associated with questionnaires and allowed for the exploration of other issues that were considered important by the local community. This only took place when the researcher and interpreters carried out questionnaire interviews together. When the interpreters completed questionnaires alone they were instructed to identify key informants who could be interviewed in depth at a later date. The questionnaire used in the report can be seen in Appendix One.

Throughout the fieldwork an effort was continually made to ensure that the views of minority and weaker groups (such as women and less affluent members of the community) were included. This was to ensure that the research was as representative as possible.

6.8 Site Selection

After discussions with various individuals who had knowledge of the area it was decided that Nhambita, situated in the southern buffer zone of GNP, would be the site where the study would be carried out. All areas within the buffer zone vary to some degree in terms of environmental, economic and socio-cultural factors. However, the site selected was taken to be fairly representative of other communities within the buffer zone of GNP. For example, it was a subsistence farming area, dependent to a large extent on the ability to exploit and use natural resources in the area to meet basic needs for food, shelter and economic security. In addition, basic infrastructure, services and access to transport were severely limited. It was also an area that had suffered greatly during the civil war and contained many people who were recently returned refugees. These factors are shared with many other communities in the buffer zone.

7.0 FIELDWORK AND DISCUSSION

This section aims to examine the findings of the field study. It was felt that a full presentation of the Nhambita report was neither required, nor within the remit of this study. Instead, each methodology will again be examined individually, with the examination focusing on specific activities that took place within the study. In order to promote clarity in this investigation, a discussion and summary of the advantages and disadvantages of each technique will also be presented within this section.

7.1 Findings from RRA

RRA activities that will be examined include: background reading, mapping exercises, use of aerial and terrestrial photography, observation of the environment and transect walks, the use of indicators and measurements and interviews and focus group meetings. Each will be examined individually, ending with a summary regarding the strong and weak points of RRA activities.

7.1.1 Background Reading

Valuable knowledge was gathered from background reading. It provided information regarding the type of studies that had already been carried out in the surrounding area, the methodologies that were used and the type of data collected. It became clear that many of the previous studies tended to focus on agriculture and associated economic activities. Such studies provided useful insight into the important issues that should be explored from an agricultural perspective. They also provided information in terms of geographic and climatic data associated with the area. The majority of studies were also based on questionnaire surveys rather than qualitative studies, or were produced from desk studies rather than field-based studies.

Background reading provided useful information in terms of supplying an historical context to present day Mozambique. This included in depth research into the civil war, an important factor in relation to the Nhambita community. The history of the *Regulo* (traditional leader) system and how it has evolved from the colonial era to the present day was also examined. This proved to be an advantage during the fieldwork for two reasons, initially it promoted rapid understanding of the

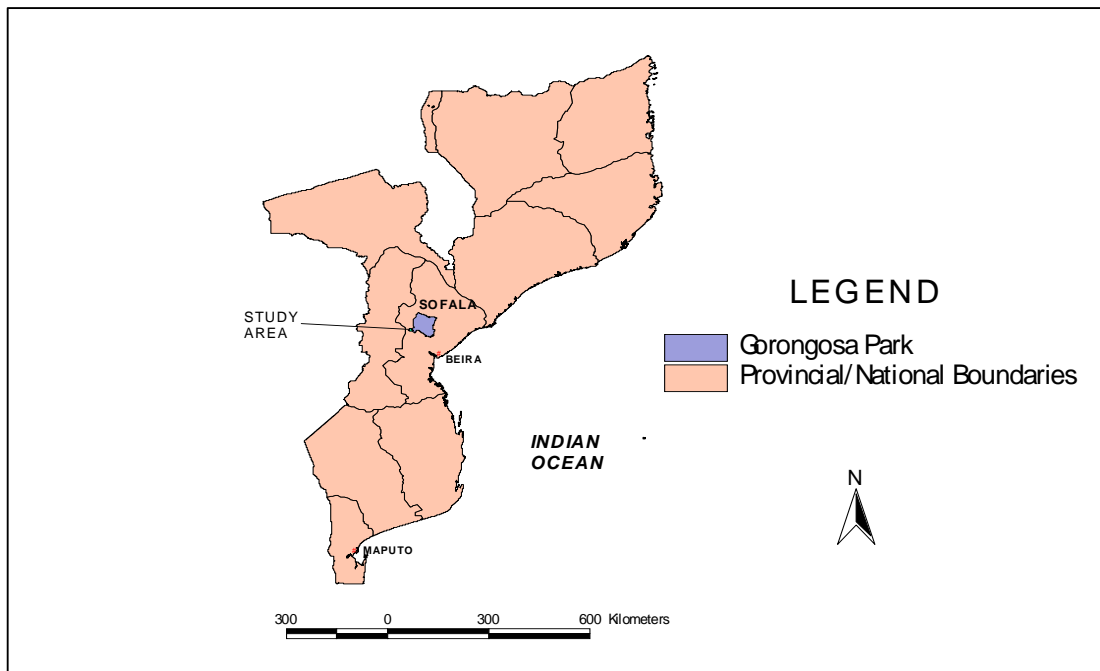
system once in the field, and secondly because it was useful to know who the leader was in order that this person could be approached to authorise the fieldwork.

7.1.2 Mapping Exercises

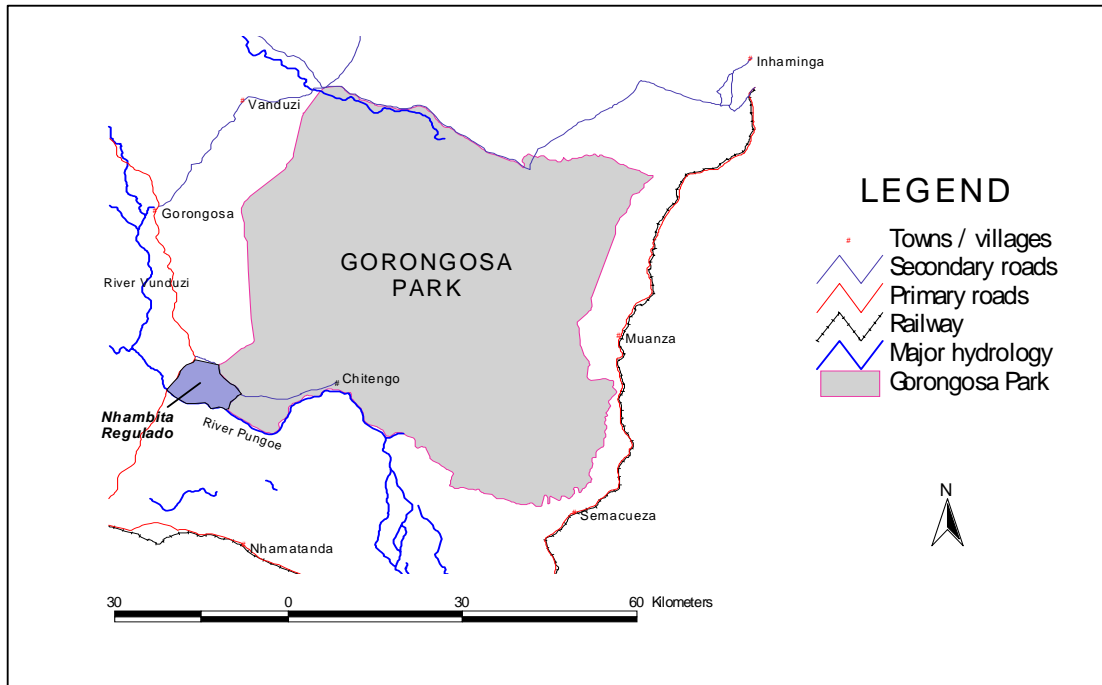
It was difficult to locate accurate, detailed maps of the Nhambita area. Maps that did exist dated back to colonial times and were not always accurate. In order to get around these problems the community was initially requested to draw a resource map as part of a PRA exercise (see Map 7.4). From this it was possible to explore the area and take readings at certain points using a GPS.

In order to provide a reasonably accurate map for the report, existing maps were digitalised with Nhambita GPS readings overlaid. Through this technique maps were produced showing Sofala Province and GNP; GNP and the study area; and the study area in detail. These maps are shown below.

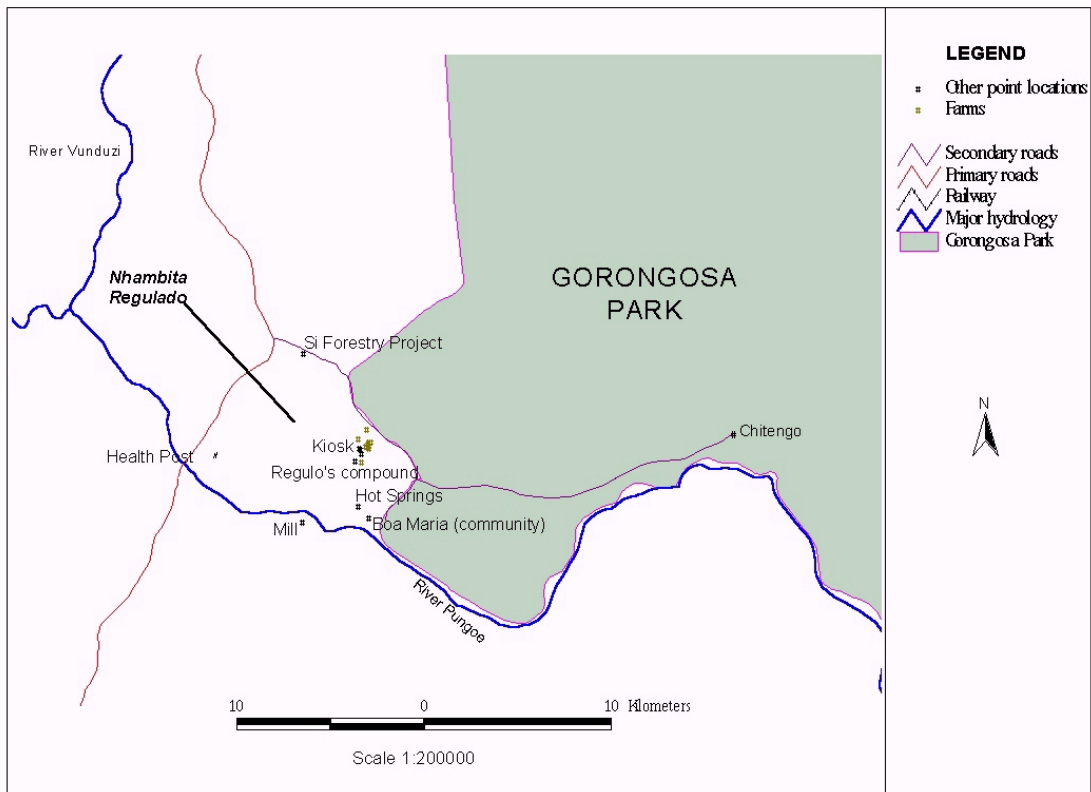
Map 7.1 Mozambique, Indicating Sofala Province and Study Area



Map 7.2 GNP and Nhambita *Regulado*



Map 7.3 Nhambita *Regulado*



7.1.3 Photography

Both aerial and terrestrial photography were used during the study. The aerial photography was however, qualitative (oblique) rather than quantitative (vertical). It could therefore be used to give a general impression of the area, but was not suitable for interpretative purposes.

Generally, photography was found to be a useful addition to the study and was used both in the report itself and in a slide presentation that took place on completion of the report. Photographs provided context and allowed people to visualise issues that were being discussed both in the report and at the presentation. This appeared to promote interest and facilitate understanding (for example, of the level of deforestation caused by *machamba* clearance, which is discussed in greater detail overleaf). Photographs were used at the presentation to make posters that participants also appeared to find useful.

Aerial photography was particularly useful as it provided a different perspective on the effects of community activities. For example Plates 7.1 and 7.2 overleaf both show a *machamba*. The different perspective and information provided from aerial photography (Plate 7.1) compared to terrestrial photography (plate 7.2) can clearly be seen from a comparison of the two images. Aerial photography in this case allows a greater insight into the level of forest clearance that takes place for *machamba* purposes.

Aerial photography taken at annual (or specific) intervals would be a valuable tool for analysing the effect of community activities on forest resources over time. However, this was outside the time remit and information requirements of the Nhambita report.

Plate 7.3 to 7.5 are taken from the report and give a general impression of Nhambita community.

Plate 7.1 Aerial Photography of Typical *Machamba* Area



Plate 7.2 Typical *Machamba* Area from Ground



Plate 7.3 Methods of Grain Storage



Plate 7.4 Field Clearance



Plate 7.5 Water Collection from the nearby River



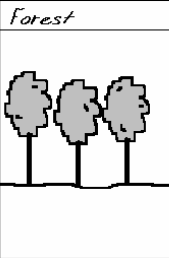


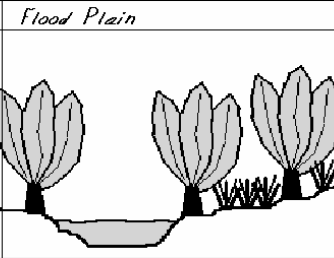
7.1.4 General Observation and Transect Walk

A significant amount of time was spent in general, independent observation of the area and environment. This not only provided important information but also gave the community a break from research questions and meetings. It was obviously not feasible to engage local people in activities and discussions every day. Observing the environment in this manner provided the opportunity to cross-check information. Additionally, notes were made of interesting phenomena in order that further enquiries could be made with the local community.

A wide range of information was gathered from these activities. Initially, a transect walk was carried out. Transect walks are of particular use in gaining a better understanding of how land is used. As the walk progresses a diagram is constructed of the changing ecological and land-use aspects of the area. Other factors of interest or importance can also be included in the diagram. In Nhambita the transect involved walking from the outer edge of the *Regulado* by the road, directly across the *Regulado* to the banks of the Pungue River (see Map 7.4).

As the walk progressed, a record was made of the changing environmental characteristics. This included soil and vegetation types and evidence of management practices and/or degradation. GPS measurements were also taken at specific points along the transect to measure distances. The results of the transect walk were recorded and can be seen in the Figure 7.1 below.

Figure 7.1 Transect Walk

	Forest	Agriculture	Agriculture	Flood Plain
				
<i>Soils</i>	<i>Sandy loam</i>	<i>Loam</i>	<i>Sandy</i>	<i>Alluvial soils</i>
<i>Land Use</i>	<i>Miombo woodland</i>	<i>Crops and housing</i>	<i>Crops</i>	<i>River bed (seasonal river)</i>
<i>Crops</i>	<i>Fuelwood, construction material, honey, medicines, wild foods</i>	<i>Maize, beans, cassava, sweet potatoes, papaya</i>	<i>Cotton grass for thatching, bamboo</i>	<i>Tobacco, sugar cane, maize, cassava, bananas</i>
<i>Problems</i>	<i>Loss of forest due to agricultural expansion</i>	<i>Land shortage, soil erosion</i>	<i>Soil less fertile</i>	<i>Flooding, mosquitoes</i>
<i>Opportunities</i>	<i>Market non-timber forest products</i>	<i>Erosion control, permaculture</i>	<i>Agroforestry to improve soil</i>	<i>Fertile land, opportunities for horticulture & erosion control</i>

From the transect walk and other observations made while investigating the area it was possible to construct a list of crops and fruit trees grown on *machambas* and in and around homesteads. Information was added to this list at a later date from further enquiries into crops that were grown at other times of the year. This list of crops and fruit trees is presented in Table 7.1 overleaf.

Table 7.1 Crops and Fruit Trees Cultivated in Nhambita *Regulado*

Grains/Oil Seeds	Tubers/Ground Crops	Fruit/Vegetables	Legumes (local varieties)	Other Field Crops
Millet	Yam	Tomatoes	<i>Jugo</i> beans	Tobacco
Maize	Sweet Potatoes*	Cucumber	<i>Manteiga</i> beans	Cotton
Sorghum	Cassava *	Pumpkin	<i>Nhemba</i> beans	Sugar cane
Rice	Onions	Cabbage	<i>Buenti</i> beans	Saffron
Sesame	Garlic	Water melon		Grass
Sunflower	Ground nuts	Honey melon		Bamboo
		Banana		
		Mango		
		Guava		
		Papaya		

*roots and leaves eaten

Descriptions could also be made of the type of forest surrounding the area through the observations. For example, the presence of species such as *Brachystegia spp.* and *Acacia spp.* along with *Pterocarpus angolensis* and *Millettia stuhlmannii* indicated that the forest was miombo woodland.

Through general observation, certain activities and practices were noted. One example was found along the banks of a dry river. Many of the very large trees had been ‘ring barked’, a process where the xylem and phloem (or food supply) to the tree is cut off, effectively killing the tree. On questioning local people it was revealed that most families had a *machamba* on the floodplain of the river. This was due to increased soil fertility in these areas, which result from annual flooding. However, many large trees could also be found along the riverbanks. These trees shaded the *machambas* and reduced crop growth. As these trees were too large and dangerous to remove using only axes, they were left *in situ*. However, they were ‘ring barked’ in order to kill the tree therefore removing the canopy and reducing the amount of shade on the *machamba*.

7.1.5 Key Indicators

The main key indicator that was examined within the community was health. This was explored from statistics collected at the local health post and through anthropometric measurements of adults and children within the community. Though not conclusive (for reasons stated below) these statistics give an indication of the health status and therefore the general state of wellbeing amongst community members. Health indicates not only the level of affluence and food availability within the community, but can also highlight the need for education regarding issues such as diet and adequate daily protein intake.

7.1.5.1 Health Post Statistics

Records were examined at the local health post and a list was made of the number of people who had visited the health post from Nhambita *Regulado* over the period of one year, including their age group and diagnosis. As the health post is situated 9 km from Nhambita *Regulado* (a two and a half hour walk for a healthy person) it was assumed that only those desperately in need of attention, though still well enough to walk, would seek treatment. This would therefore give an indication of the type of moderately serious illness that was most common. From this information the following graphs and table shown overleaf were produced.

Graph 7.1 Overall Annual Incidence of Disease

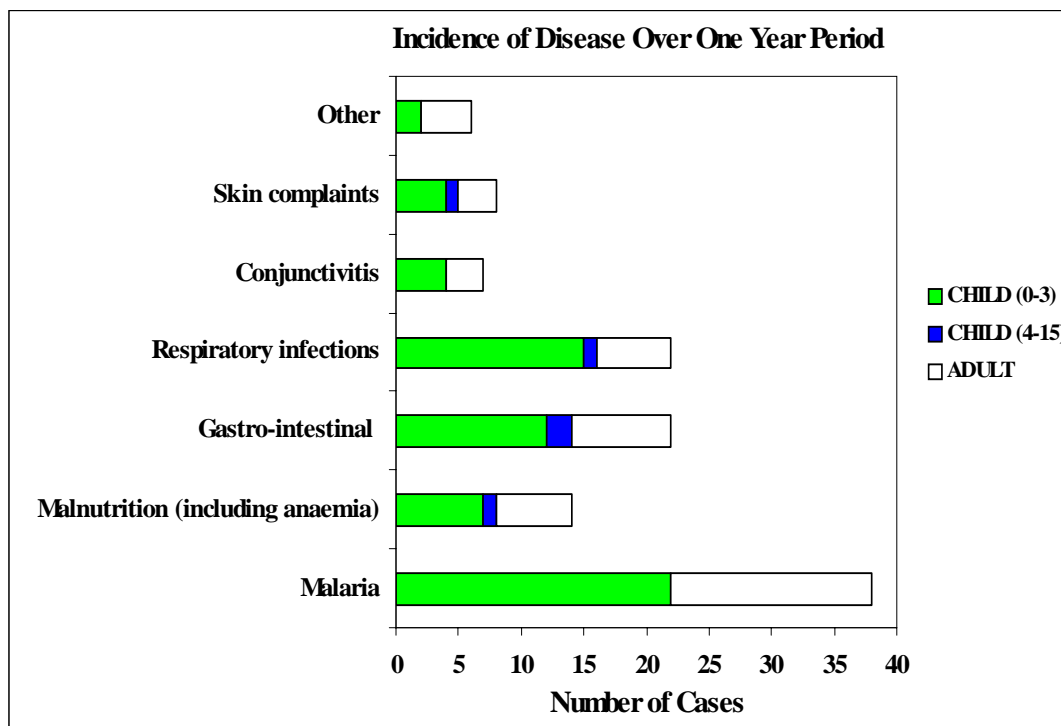
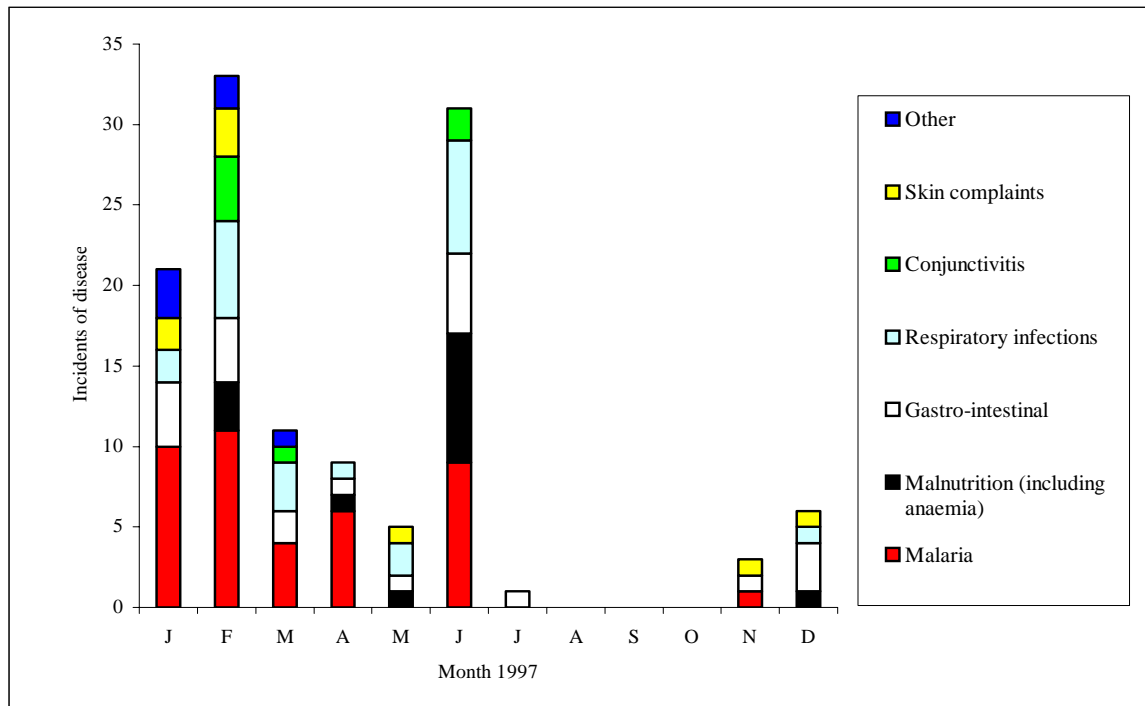


Table 7.2 Incidence of Disease per Month*

	J	F	M	A	M	J	J	A	S	O	N	D
Malaria	10	11	4	6	0	9	0	0	0	0	1	0
Malnutrition (including anaemia)	0	3	0	1	1	8	0	0	0	0	0	1
Gastro-intestinal	4	4	2	1	1	5	1	0	0	0	1	3
Respiratory infections (including asthma, chest infections, sore throat and coughs)	2	6	3	1	2	7	0	0	0	0	0	1
Conjunctivitis	0	4	1	0	0	2	0	0	0	0	0	0
Skin complaints (eczema, burns, abscesses)	2	3	0	0	1	0	0	0	0	0	1	1
Other (oedema, non-specific infection)	3	2	1	0	0	0	0	0	0	0	0	0

* It should be noted that certain people presented with more than one symptom. For the purpose of this exercise each is treated as a different complaint. However, it is possible that the second symptom that was reported occurred as a result of the initial problem. For example, a person may be suffering malaria as a primary problem with malnutrition or anaemia representing a secondary symptom of the disease.

Graph 7.2 Incidence of Disease per Month



It can be seen from both of the graphs and the table that malaria is clearly a severe problem within the district. Graph 7.1 indicates that in the majority of patients treated at the health post are children (under four years of age). The data from graph 7.2 indicate two clear peaks when illness is common. The first occurs around January/February and the second around June. During the period of July to October visits to the clinic appeared to cease altogether.

This information was examined in conjunction with the seasonal calendar in order to attempt to explain the data. It was found that the first peak of illness coincided with the main onset of the rainy season, which would therefore explain the high incidence of both malaria, cholera (diarrhoea) and chest infections during this period. In addition, the wet season, prior to the harvest, is the time when food is most scarce. Chambers (1993:40) supports this line of argument stating that *“the wet season is often the time when morbidity and mortality are highest (and) when people are most incapacitated by sickness”*.

The second peak of illness around June is more difficult to explain as it occurs during the dry season and during a time when food is available. The high incidence of disease at this time may be a result of poor nutritional intake during the wet season, weakening the immune system and

lowering resistance to disease. Infection and malnutrition are often associated and the effect of one condition can contribute to the other (Eade & Williams, 1995). The overall effect is not additive but synergistic. An individual experiencing malnutrition is therefore increasingly likely to suffer infection and disease due to decreased resistance. In addition infection and disease can also contribute to the development of malnutrition. This is because diseases (such as malaria) are often accompanied by anorexia, vomiting, loss of appetite and malabsorption of nutrients.

The absence of visitors to the health post from August to October can only be explained as being a consequence of the availability of adequate food during the dry season.

7.1.5.2 Anthropometric Statistics

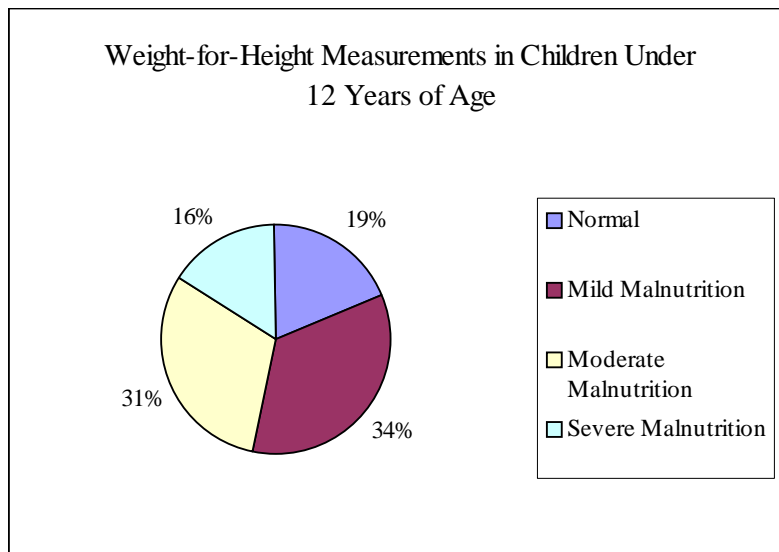
Anthropometry, carried out in children under 12 in Nhambita measured the outcome of current and previous nutritional status in terms of growth rate. Such measurements consider the total mass of body tissue (weight, showing the body's current energy store) and a measurement of linear size (height, summing up the body's history of growth). These measurements usually also take into account the age and sex of the child and the results can then be compared against what are considered 'normal' growth standards (Young and Jaspars, 1995).

In the case of Nhambita, the age of children could not be considered because most people in the area did not know their birth date. Measurements were therefore based on weight-for-height measurements only and were analysed using NCHS sex specific reference standards. (It should be noted that when using the weight-for-height measurement alone it is not possible to distinguish between, for example, a child suffering malnutrition and a tall and normally lean child, as both have low weight for height. Also the NCHS standard is based on U.S. children and is not culturally specific).

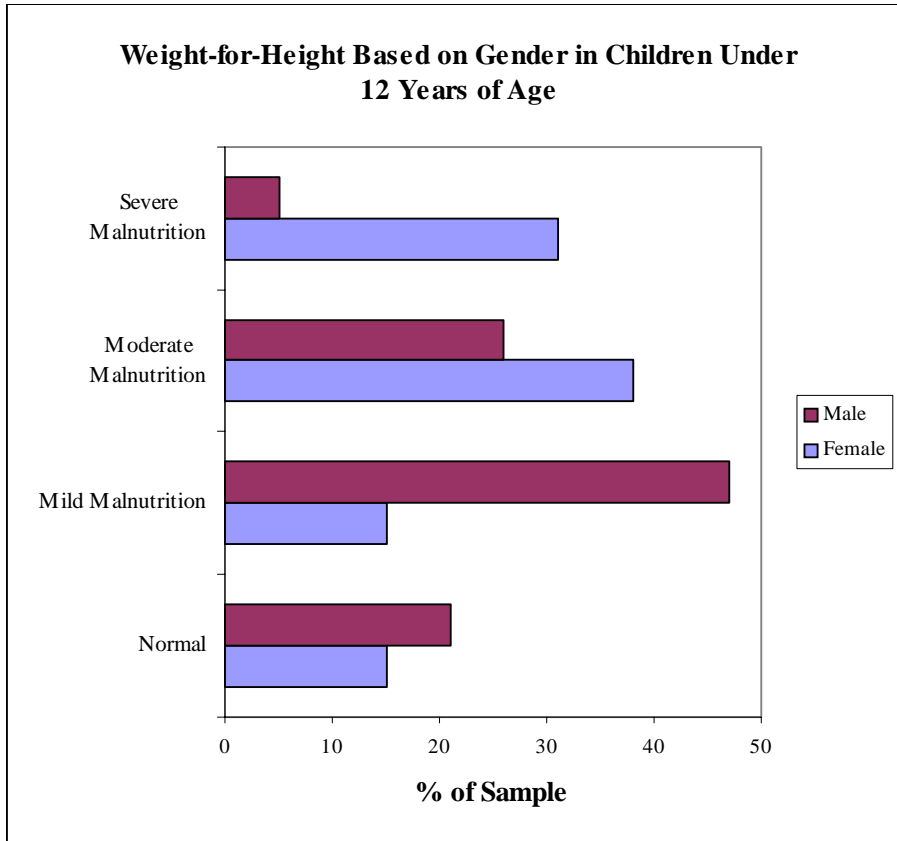
The NCHS standard uses arbitrary cut-off points to decide at which point a child's height and weight fall outside the normal range. Z-scores, which measure standard deviation from the median of the reference population were used as cut off points, with the scale ranging from below -3 representing severely undernourished, to over +1 representing over-nourishment.

Graph 7.3 shows the result of weight-for-height measurements of a sample of 32 children under 12 years of age in Nhambita *Regulado*. It should be noted that the majority of these readings came from children attending the school rather than from a strictly random sample and so tended to include children from the more affluent families that could afford to pay school fees. As a result the sample group was not determined scientifically and the validity of the results can therefore be questioned.

Graph 7.3 Weight-for-Height Measurements in Children Under 12



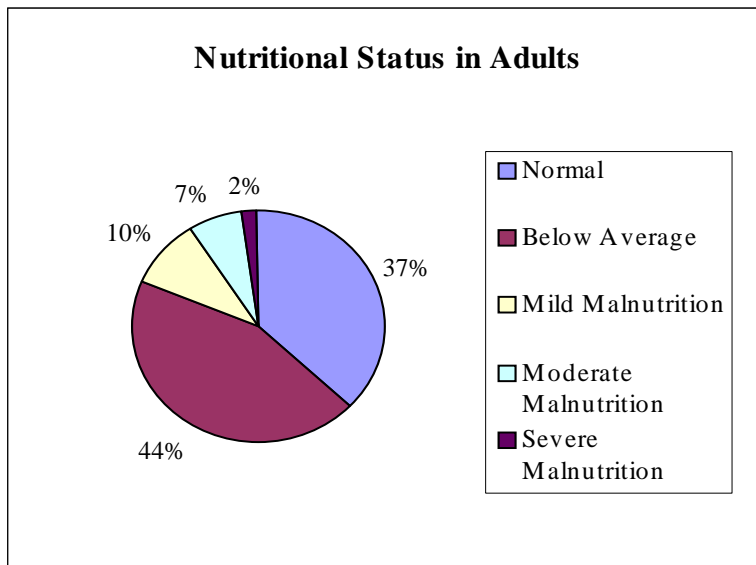
Graph 7.4 Weight-for-Height (according to sex) in Children Under 12



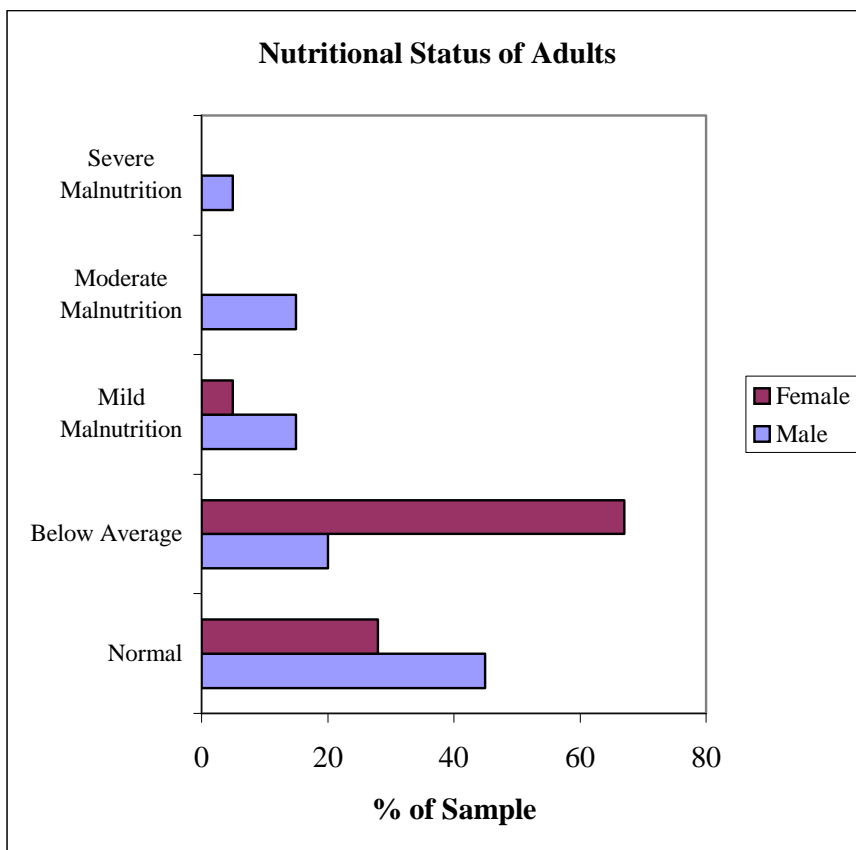
The graphs indicate a considerable amount of malnutrition within the community in children under 12 years of age. A marked difference can be seen between the incidence of malnutrition in male and female children with more male children having normal nutritional status or suffering only mild malnutrition. Female children however, show a much higher proportion of moderate and severe malnutrition, which may indicate that male children are favoured above female in terms of food provision.

Adult anthropometry used body mass index (BMI) calculations (weight divided by height squared) to indicate nutritional status and deficiency. The cut off points range from 22 for a normal female and 20.8 for a normal male to 16 and below for severe malnutrition. A total of 41 adults were measured. The results can be seen in the graphs below.

Graph 7.5 Nutritional Status of Adults



Graph 7.6 Nutritional Status of Adults (according to sex)



The graphs indicated that mild, moderate and severe malnutrition were less common in adults than in children. However there are a significant number of people with below average weight, particularly among women. In general, more men were found to have normal nutritional status than women.

According to Eade and Williams (1995:679) “*malnutrition is almost always a consequence of poverty, and of ill health, though ignorance and poor education also play a role*”. The brief investigation of health and malnutrition in this community clearly indicates that ill health is problematic and that malnutrition is potentially a serious problem. This probably indicates the existence of poverty and lack of education within the community, two factors that seemed apparent from general observation in the area.

By using the two indicator tests (health statistics and anthropometry), information regarding nutritional status was cross-checked, which improved the quality of data. The number of children with nutritional problems was obviously much higher than indicated by the number of children attending the health post.

Additionally, this section highlights the benefits associated with comparing the results of two different studies each carried out using different methodologies. For example, comparing the results of the health post statistics with the seasonal calendar helped to explain the reason for the two peaks in illness during the year.

7.1.6 Interviews and Focus Group Discussions

Interviews (one-on-one) and focus group discussions tended to be semi-structured or structured. Usually a list of questions or issues to be explored was prepared in advance. However, the list was not rigidly fixed and other issues were explored if appropriate. Interviews were carried out in this manner mainly with key informants within the community. These were people that had specialised knowledge of a certain aspect or aspects of community life and included the *Regulo*, *Chefe* and *M'fumo* (members of the traditional hierarchy), the traditional healer, the school teacher and health post staff. Ordinary men and women (farmers) were also interviewed in this manner.

The table below indicates examples of the type of information that was gathered from some of these groups of people.

Table 7.3 Key Informants

Interviewee	Information
Traditional Leaders	System of hierarchy Role of traditional leaders Relationship between political (Frelimo) and traditional leadership Population data for <i>Regulado</i> Rules governing access to natural resources Perceptions of land tenure Main community problems
Traditional Healer	Types of illnesses common in <i>Regulado</i> Types of medicines used to treat specific illnesses Attitude to modern medicine Recent problems accessing resources due to scarcity
School Teacher	Cost of school fees Problems with school building Number of classes taught Availability of materials General age when pupils leave (male and female)
Community members	Attitudes to Gorongosa National Park Attitudes to conservation Perceptions of land tenure Rules governing access to natural resources and conflict resolution Main community problems

As can be seen, in certain cases information was cross-checked between more than one group of people. This was for triangulation purposes and also to attempt to ascertain the perceptions of different groups of people to the same issues. For example, problems within the community were generally agreed upon, though there was sometimes a dispute as to which problem was the most serious. Younger people for example, tended to complain about lack of employment in the area more than older members of the community. In terms of land tenure, however, perceptions varied. The *Regulo* believed he ruled the area on behalf of the government, while members of the community held a mixture of beliefs as to who controlled the land.

7.1.7 Summary

It is clear that RRA constitutes a whole range of activities. It is also clear that a wide range of information can be collected using RRA techniques. Certain techniques, such as background reading, are essential to every study. This can be carried out prior to fieldwork and can save a lot of time and confusion once in the field.

Many RRA techniques can be carried out independently, without occupying the time of people from the local community. This is an important factor when working with people who may be busy with agricultural activities.

A wide range of data is produced, ranging from qualitative personal interpretations of the landscape to relatively quantitative data produced from indicators. The large amount of observational work involved in RRA allows the researcher to identify activities that can be explored in more detail at a later date, either using other RRA techniques (such as interviews) or different methodologies altogether (such as PRA exercises). In addition a certain amount of cross-checking and triangulation is possible as interviews can be cross-checked with observations and vice-versa.

It can be seen from this section that cross-checking the data can be advantageous either in explaining certain aspects of data, or to improve the quality of data. Checking the health post data with the seasonal calendar for example, was useful in explaining the peaks in ill-health. Cross-checking health post and anthropometric data provided a more accurate picture of levels of malnutrition.

RRA activities can normally be completed within a relatively short period of time. Gathering the data from the health post, for example, required a few hours work and provided a great deal of valuable information. Similarly anthropometric measurements can be carried out relatively quickly and easily, especially if arranged to coincide with an occasion where people were already scheduled to meet, such as at school.

This section of work proved very useful and contributed a large amount to the overall information collected and used when writing the final report. Improvements could have been made however, in relation to the sampling process for the child anthropometric measurements

As expected, however, this type of methodology was found to be very researcher focused and researcher led. Participation from the local community may be reduced to a minimum, in which case there is little chance to ascertain the needs and problems from a community perspective and little chance to grasp any understanding of indigenous knowledge. Even during interviews and focus group meetings when the local community were involved, the agenda was still organised and established by the researcher and the researcher maintained control of the topics discussed.

Used alone, the techniques of RRA would probably be inadequate to produce detailed information of the type needed to inform the production of management and development plans or the initiation of development activities. However, it provides a large amount of information that is appropriate, particularly when used in conjunction with other techniques for cross-checking purposes.

7.2 Findings from PRA

The main PRA techniques that were carried out during the fieldwork include: resource mapping, spidergrams (showing resource use, crops grown and the main problems experienced by the community), timelines, seasonal calendars, farming systems analysis, division of labour analysis and timetable analysis of the daily activities of women. Each of these techniques will be analysed separately, ending with an overall summary regarding PRA methodologies.

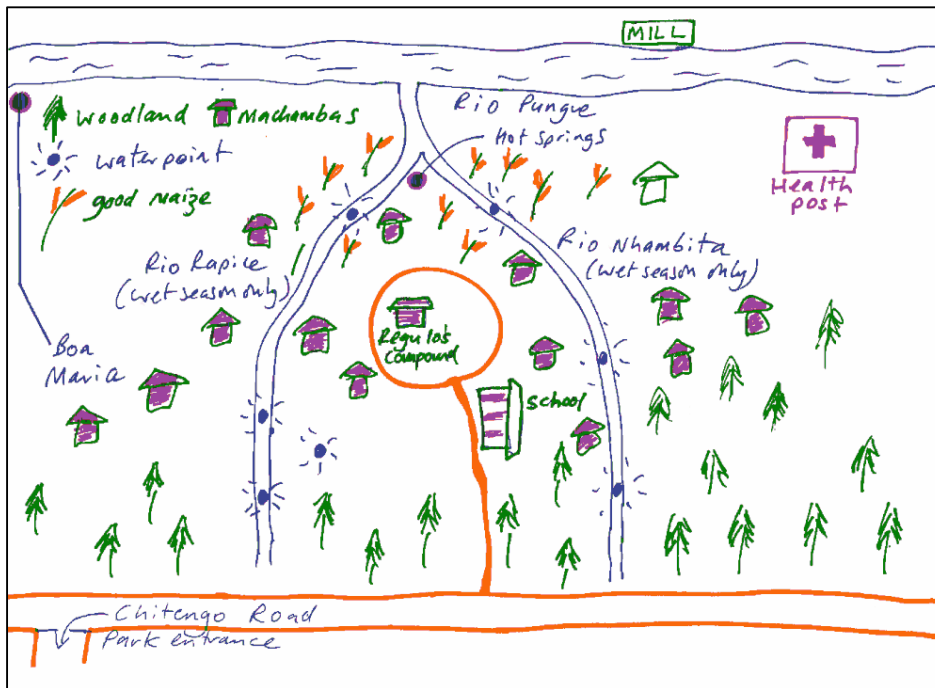
7.2.1 Resource Mapping

This was the first PRA activity to be carried out with the community and proved to be very useful. This activity was carried out for three reasons. Initially, it was necessary to understand which resources local people considered to be important within the community. Secondly, as previously mentioned maps for the area were not available. A schematic resource map would help the researchers become more familiar with the area and its important aspects. Thirdly, sacred sites, land-mined areas or sites where outsiders were forbidden to enter could also be identified as soon as possible.

This meeting was open to all people and the community worked in two groups, one of mainly women and one of mainly men. A cross was placed on the map to indicate the area the meeting was taking place and the nearby path was indicated. The community then continued to complete the map. An occasional question was asked by the researcher, which usually led to further discussion and drawing. At the end each group presented their map to the other group which again led to much discussion, especially in areas where the groups disagreed.

One such disagreement occurred regarding the number of water-holes in the *Regulado*. The men drew many more water holes on their map than the women. It transpired that the men had drawn all the waterholes in the *Regulado*, whereas the women had only drawn three waterholes which were the ones that had not yet dried up and were still functioning. An approximate diagram of the resource map (as drawn by the men) is shown below.

7.4 Resource Map of Nhambita *Regulado*



The map indicates the variety of information that was collected from this exercise. Each new piece of information usually led to further discussions, for example, when the rivers were drawn on the map, further information was discovered about which rivers were seasonal and which permanent, which areas were used to collect water, the quality of the water and whether fishing activities took place. The presence of other resources (such as forest and areas of good soil fertility) as well as infrastructure (roads), services (schools, church, health post and mill) and sacred sites (hot springs and surrounding forest) were also discovered from the map.

Such information also led to the identification of areas in which further research was needed. For example, after this meeting it was decided that certain places such as the hot-springs, health post, school and the mill would need to be investigated in order to collect further information. It was decided for example, that health data and an assessment of facilities available at the health post was needed and that the school teacher should be interviewed in order to analyse the level of education available in the community.

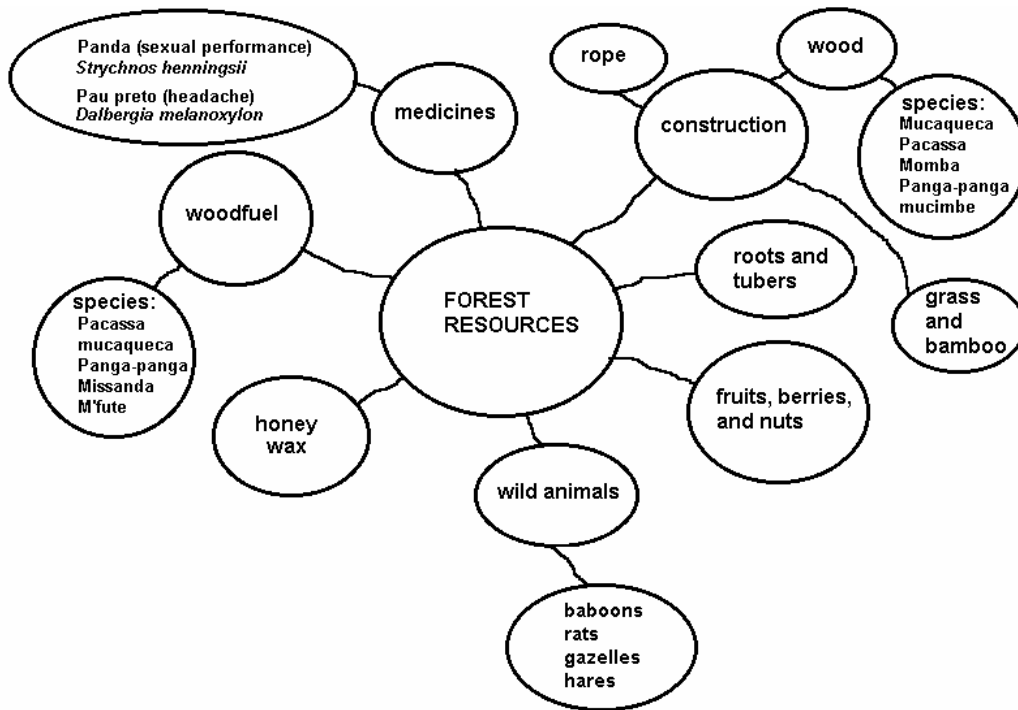
In terms of the PRA used with the local community, this technique proved to be most successful. The community readily took over the discussion and presentation. Using the two different groups stimulated interesting discussion and led to the production of interesting and valuable information.

7.2.2 Spidergrams

Spidergrams were used at group meetings in order to both collect information in a relatively holistic manner and stimulate group discussion. Spidergrams were successfully used to discover which forest resources local people used. This usually led to further discussions about each particular resource. For example, local people reported that they collected fuelwood from the forest. This led to further discussions about fuelwood, including species preferences, collection time and location. Spidergrams were also used to discover what crops were grown in the area and what local people considered to be the main problems within the community.

When constructing a spidergram the body of the spider represents the main issue that is to be examined in the meeting and each leg represents a factor relating to the main issue. Additional information is added to each leg. The following diagram shows the spidergram that was drawn when exploring the forest resources used by the community of Nhambita.

Figure 7.2 Spidergram showing Forest Resource Use



The spidergram technique was useful as it was very easy to understand and people became involved quickly and easily in the discussion. As each main topic is written down it also centralises the discussion around the issues at hand while still maintaining flexibility to explore other associated issues.

Though ranking was not used in this case, it would be possible to rank results of a spidergram by indicating for example, which of the resources indicated was the most and least important.

7.2.3 Historical Timelines

The historical timeline was introduced in order to attempt to understand the history of Nhambita *Regulado*. It was also envisaged that information might be gained regarding the civil war and population movement during this time. Carrying out the timeline activity involves drawing a line along the ground. The farthest point is the distant past where the most distant memory is recorded.

The closest point is the present. Any events that can be remembered between the two points are filled in sequentially.

This activity was carried out soon after the arrival of the research team in the community, as it was believed that gaining an understanding of the past would facilitate an understanding of the present. The activity was carried out with the elder members of the community, as it was considered that they would be most knowledgeable about the history of the area. The timeline diagram is shown in Figure 7.3 below.

Figure 7.3 Historical Timeline

<p style="text-align: right;">1994 End of civil war, “people start to return to their <i>machambas</i>”</p> <p style="text-align: right;">1975 Independence from Portugal</p> <p style="text-align: right;">1948 Gorongosa National Park created “We were forced to leave our homes and made to move here”. “They burned our homes so that we could not return, and people were forced to work for the Portuguese building roads. This was slave work, if we were tired, we were beaten”</p>	<p>1997 Present</p> <p>1981 Start of civil war “Big drought at this time”</p> <p>Post 1948 “Women were forced to work in cotton production if they were not married. There were sometimes droughts, and one lasted for 3 years”</p> <p>Pre 1948 Community situated inside Gorongosa National Park. “We were able to use the resources of the park, we used to hunt buffalo and antelopes and make honey and palm wine”</p>
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From the timeline above it can be seen that a certain amount of information was generated, particularly regarding the lifestyle change after GNP was officially recognised and opened. The elderly people had particularly bad memories of this period in time and continued to hold resentment against the national park. However, on cross-checking this information with other groups of people it was found that this was not the case with everyone. Those who remembered 1948 continued to resent the park whereas the younger generation held optimistic views about the positive benefits the park could bring to their lives. For the present generation, laws forbidding large-scale hunting activities were now considered normal.

Problems were however, experienced during this meeting. As past activities and events were being discussed, it was immediately assumed by the community that the objective of the study was to investigate the war. As communities in the district had provided support (willing or otherwise) to RENAMO during the war, and the present government is FRELIMO, it was assumed that the research was being performed on behalf of FRELIMO. This upset people, so the topic was moved to the national park. However, remembering being forcibly removed from the park provoked more bad memories and in the end the meeting closed on a sad note for everyone.

The mistake made appeared to be a combination of asking the wrong questions without attempting to assess what the reaction might be and holding the meeting too early after the arrival of the research team in the community. With hindsight, it would have been better to wait and hold such a meeting when the whole community was familiar with the researcher team and a level of trust and knowledge about the nature of the work had been developed.

Alternatively, with such a controversial subject as the civil war, it may have been better to restrict such conversations to one-on-one interviews that could have been held with specific people after a level of trust had been established. However, it is possible to see that in a different environment the historical timeline would provide valuable and useful information. This was not however the case in Nhambita.

7.2.4 Seasonal Calendar

The seasonal calendar was carried out in order to clarify information regarding monthly agricultural activities over the course of one year. This also provided an opportunity to cross-check information regarding which crops were grown. Questions were also be asked about annual events, such as the time of most and least hunger, most and least rain and prevalence of pests. An example of a seasonal calendar prepared in Nhambita is shown below.

Figure 7.4 Seasonal Calendar

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
RAINFALL												
AGRICULTURAL ACTIVITIES FLOODPLAIN MACHAMBA	HARVEST Maize		REST			PREPARE Clear Burn	PLANT Onion Tomato Sweet potato Maize Garlic Cabbage			HARVEST Banana Onion Sweet potato Maize Garlic Cabbage		
AGRICULTURAL ACTIVITIES HOME MACHAMBA			REST	HARVEST Maize Groundnuts Sweet Potato Beans Cassava sesame	REST	HARVEST Sorghum			PREPARE Clear Burn	PLANT Maize Sorghum Groundnuts Beans Cassava Sesame Sweet potato		
OTHER	Food most scarce Weevils problem				Rats problem					Water most scarce Grasshoppers and beetles problem		

Seasonal calendars were not carried out during group meetings. Instead they were carried out with individual people or families on their *machamba* areas. This tended to be the case with most of the enquiries into agricultural data as it was found that being on the *machamba* allowed the farmer to point out certain practices or demonstrate certain points with greater ease. The researcher could therefore develop a better understanding of activities. Also, being able to see the *machamba* area enabled the researcher to directly observe and question practices and activities.

Seasonal calendars were carried out on several occasions in order that information could be cross-checked between different farmers, and to ascertain whether cropping activities and species tended to be the same throughout the *Regulado* or differed between different families or areas. The seasonal calendar also proved useful when cross-checking against other, non-agricultural information, such as the health-post data (see section 7.1.5.1).

7.2.5 Farming Systems Analysis

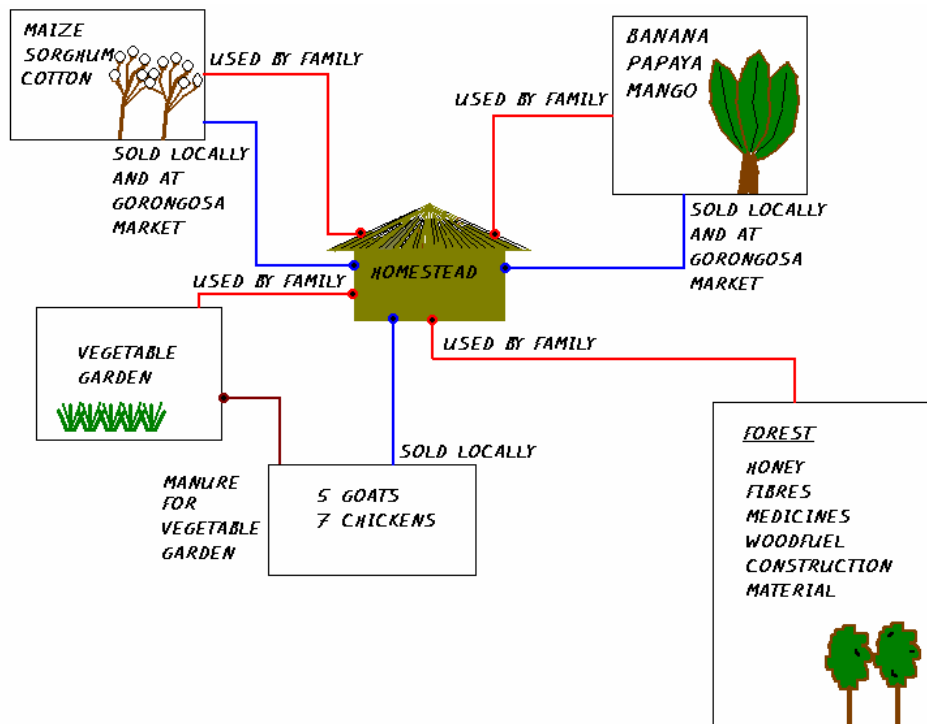
In addition to the seasonal calendar, further information regarding agricultural practices was collected using farming systems analysis. This involved an investigation into the inputs and outputs of the farm. It also included information such as fallow systems, burning and shifting cultivation practices, inheritance systems and the main problems experienced on the *machamba*. Opportunities and constraints in terms of marketing produce were also explored during these interviews.

Again, this technique was carried out on individual *machambas* and with a variety of individuals and families in order that the information could be thoroughly cross-checked. Information was also cross-checked with data collected from other activities about agricultural practices.

Cross-checking between families provided interesting information regarding differing farming activities within the *Regulado*. One example of this relates to the practice of fallow farming. Fallow farming was found to be the traditionally farming method in the area. However, there were some families that had returned to the area after the civil war that did not appear to have any knowledge of fallow farming. These families all tended to be younger people without parents, with perhaps an elder sibling heading the family. In many cases these young people had lived in refugee areas outside Nhambita for most of their lives. It appeared that people who were returning to the community in this manner had lost information regarding traditional farming practices.

The diagram below shows one of the farming system diagrams that was produced with a farmer in Nhambita. This interview concentrated on inputs and output in the farming system in association with economic activities.

Figure 7.5 Farming System Analysis



The farming system analysis was useful due to the varied nature of information that was produced. As several interviews were carried out, issues that were not explored in one interview could be explored in another with a different farmer. Flexibility could therefore be maintained and the conversation could focus on issues that the farmer perceived to be important. One farmer for example had specific problems marketing produce and talked at length about this problem while another had problems storing seed. Using the diagram however, helped to contextualise issues that were being discussed and led to a holistic analysis as the linkages in the farming system became apparent.

7.2.6 Division of Labour

An investigation was held into how labour is divided within the community for several reasons. Most importantly, it was necessary to know which group of people would most benefit from development projects. This group of people could then be targeted to assist in the project activities. For example, if a 'grist-mill' was to be introduced to a community, it would be important to know who was currently responsible for all the different stages of the milling process. This would clearly be an important group to approach in terms of identifying and exploring the feasibility of such a project.

Secondly, in terms of natural resource management, it was necessary to know which groups of people were using and managing the resources. This was especially important if, for example, the national park wanted to work with community members to prevent certain activities that might be harmful to the park. For example, the most common practice used to clear agricultural fields is burning. This is because burning does not require a large amount of labour and it also adds nutrients to the soil in the form of ash. However, sometimes fires used in this manner are unmanaged and spread into the surrounding bush area.

Continual, uncontrolled bush fires in the buffer zone can be particularly problematic as habitat is destroyed and animals are frightened. The national park might therefore want to work with local people to reduce the effects of such activities (for example, by encouraging people to burn the waste in piles inside the cleared area, therefore within a fire break) in the future. However, it is initially necessary to know which groups of people are responsible for burning as these will be the groups targeted for extension activities.

Table 7.4 shows the division of labour within Nhambita *Regulado*. The inquiry extended into activities carried out on the *machamba*, homestead and within the forest area.

Table 7.4 Division of Labour within Nhambita

FEMALE	MALE
Homestead	
Collecting water Washing clothes Sweeping homestead and house Collecting/chopping firewood Building fires & cooking Washing plates/utensils Washing children Grinding grain to flour (manually) Preparation of dry maize for milling Attending to livestock	Building houses Thatching roofs Collecting/chopping firewood Attending to livestock Bee-keeping
Machamba	
Clearing & burning Planting Harvesting & storage preparation	Clearing & felling trees Harvesting
Forest/Other	
Carrying grain to mill Gathering forest products (fruit etc.)	Hunting Fishing Gathering honey from forest Collecting grass Collecting bamboo

The division of labour exercise was mostly completed at a meeting held with a group of women, after discussing the main responsibilities of each group. Further information was added later as a result of RRA activities and the questionnaire survey. These activities also provided an opportunity to cross-check information given by the women.

It can be seen however, that Table 7.4 is by no means exhaustive. In retrospect it may have been useful to include information regarding economic activities such as the sale of resources and control over economic activities. Such enquiries would have proved especially interesting in polygamous households. It may also have been useful to include the effect of polygamy on the division of labour within the study.

7.2.7 Daily Timetables

Daily timetables were produced with several women and men in Nhambita to ascertain the usual pattern of daily activity. The timetables were completed for both the wet and dry season for comparative purposes. Understanding timetables and daily workloads provided insight into the lives and problems of local people. For example, if four hours a day were spent on water collection or fuelwood collection it would indicate that a problem existed in gaining access to such resources.

Such timetables are also useful to the researcher when planning activities. For example, knowledge of the daily timetable enables the researcher to organise activities at times when people are less busy. In Nhambita for example, women arrived at a pre-arranged meeting two hours late. The meeting coincided with the coolest part of the day when most *machamba* work was carried out. Consequently, the work was carried out as normal, then afterwards the women came to the meeting. This situation would have been avoided if the timetable had been completed on arrival in the community. This information is also useful as a planning tool to others who may be involved in the introduction of development activities in the future. Table 7.6 shows an example of one of the daily timetables from in Nhambita.

Figure 7.6 Daily Timetables of Activity

	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Women (dry season)	Water collection Prepare breakfast		<i>Machamba</i> work			Prepare Lunch Rest			Collect fuelwood		Prepare supper, collect water, wash children, collect animals				Rest Leisure		
Women (wet season)	Water collection Prepare breakfast		<i>Machamba</i> work				Prepare lunch Rest			<i>Machamba</i> work		Prepare supper, collect water, wash children, collect animals					
Men (all seasons)	<i>Machamba</i> work						Lunch rest			<i>Machamba</i> work				Rest leisure			

The calendars were cross-checked with information from participant observation, which involved observing women at work collecting resources (such as water) on their homesteads and *machambas* and within the forest areas. This study could, however, have been carried out in greater detail, and again could have investigated the timetable of women in polygamous households. Such a detailed study may be necessary if examining the feasibility of introducing a development project that may occupy a large amount of women's time.

7.2.8 Summary

PRA activities offered a very valuable method of data collection. The techniques available for use were very varied, flexible and could be adapted to fit information needs. If the selected technique did not appear to be working (as with the Timeline) it could be abandoned either for a different technique or for a general discussion.

One of the drawbacks of using PRA alone is that it only permits cross-checking of information using other PRA techniques, or using the same technique with a different group. There is no allowance in this technique for observation of activities and events in the community. This has obvious drawbacks as information may be misunderstood and can not be clarified through observation. This affects both the quality and quantity of data that can be collected.

Certain activities appeared to promote participation and allow the community to take over the discussion more than others. The resource map for example was completely taken over by the community. People quickly became relaxed, began to enjoy themselves and appeared to forget that there was a researcher present at all. In terms of collecting accurate data this was very useful. Spidergrams also promoted participation and discussions, but tended to be more researcher led than community led as people waited for the next questions to be asked rather than taking over the meeting. This tended to be the case with most of the other techniques used.

Though the main claim of PRA is that it involves activities that are essentially community led, this was a very difficult scenario to achieve, especially during a short study. Tradition Mozambican meetings tend to be formal occasions, with established protocol as to how the meeting is run, who sits where and who does most of the talking. PRA however, is relatively informal and therefore involves the introduction of a method of communication and set of activities that are not normally found in such formal settings.

The introduction of unfamiliar activities is not always successful. For example in order to ascertain the opinion of women, meetings were arranged where women alone were present. One meeting was however only attended by a handful of women. After the meeting was over one woman remarked

that more women would have come but they were suspicious as to the nature of a meeting. This was because only women were invited and this was not a normal activity. Valuable information could still be collected from a small group, but introducing such suspicion does not create an environment conducive to good data collection.

Working with different groups of people meant that there was not always the opportunity for members of the local community to become familiar with PRA techniques. On some occasions 'passing the stick' or the pen to members of the community was not always easy and in some cases people continued to participate though refused to take the pen and draw or write themselves (even though members of the community were literate).

It was initially felt that efforts should be made to operate within what is normal and acceptable to local people rather than introduce a new type of meeting with which people were not familiar. However, experience indicated that traditional community meetings tend to be dominated by the more powerful groups within the community while the poor and vulnerable have no chance to speak. For example, during meetings where both men and women were present, women sat outside the meeting hut, did not participate very much and became embarrassed if their opinion was specifically sought. Attempting to address this problem was not easy. A balance was needed between maintaining tradition (in order that people were comfortable and to avoid the scenario mentioned above when women did not attend the meeting), and ensuring that the views of poor and vulnerable people could be heard.

The most successful way to overcome this dilemma appeared to be to operate in as near a traditional manner as possible, while gradually introducing small changes. The following example again refers to the resource map. In this case, both men and women were present at the meeting. The meeting was then divided into two groups, one of mainly men and the other mainly women. Each group carried out the same activity at the same time, was comfortable with the other group members and so acted in a relatively informal manner. Neither group was embarrassed about creating the map and a level of formality was restored during the presentation.

Though PRA produced useful information, it did not allow the community to become fully involved in the research process. The experience of using PRA may however, be different for one person working within the same community for a long period of time. The gradual introduction of

PRA with a constant group of people may lead to greater familiarity, experience of and acceptance of the techniques. 'Passing the stick' may therefore become easier.

Additionally, this problem is probably related to the Mozambican history and indeed the history of development. Mozambican history is associated with 500 years of colonial rule that ended relatively recently and development history is associated with 'top-down' approaches. Mozambicans have arguably become accustomed to situations where they were told how to act by outsiders and responded accordingly, with their own opinions counting for very little and virtually no chance of controlling situations themselves. This is particularly important in relation to the form of colonialism favoured by the Portuguese, which actively repressed empowerment and did not encourage initiative or local capacity building. It is unrealistic to introduce such a different system of operation and expect it to be immediately adopted and immediately successful.

7.3 Findings from Questionnaires

Questionnaires were used to collect quantitative information about a wide range of topics. The questionnaire was prepared and coded prior to the field study and was analysed using EXCEL.

The results of the questionnaire were generally presented in the report as tables. Rather than include each table and describe the results, a list is presented below of the areas in which information was collected. A small selection of tables is also presented to indicate the type of information collected. This is followed by an examination of extended questionnaires and a review of the problems experienced with the sampling technique. The section concludes with a summary of advantages and disadvantages associated with using questionnaires.

The following list represents the type of information that was collected.

- Demographic information.
- Population movement (during the war, refugees and returnees).
- Resource use (area from where resources were taken; sale or subsistence; group responsible for collection and sale). Also includes hunting and fishing activities.
- Economic activity (working families; sale of natural resources, crops, livestock; area of sale; responsibility for sale). Also includes charcoal production activities.
- Products purchased.
- Agricultural activities (shifting cultivation, fallow, size of *machamba*).
- Tree planting activities and care.
- Wildlife in area.
- Main problems in area.

Tables 7.5 and 7.6 overleaf indicate the results from questions relating to the use of trees and grass for construction purposes in Nhambita.

Table 7.5 Use of Forest for Construction Wood

Activities	% of Sample Population/ Users/Collectors
No. Using Construction Wood (of community)	93
No. Collecting Construction Wood (of users)	69
No. Purchasing Construction Wood (of users)	20
No. Purchasing and Collecting (of users)	11
No. Collected from <i>Machamba</i> (of collectors)	1
No. Collected from Forest (of collectors)	99
No. where Men Responsible for Collection (of collectors)	95
No. where Women and Children Responsible (of collectors)	5
No. of Families Selling Construction Wood	2
Main Area of Purchase	Local Community

Table 7.6 Use of Grass

Activity	% of Sample Population/ Users/Collectors
No. Using Grass (of community)	93
No. Collecting Grass (of users)	79
No. Purchasing Grass (of users)	13
No. Purchasing and Collecting (of users)	8
No. Collected from <i>Machamba</i> (of collectors)	19
No. Collected from Forest (of collectors)	80
No. Collected from Forest and <i>Machamba</i> (of collectors)	1
No. where Men Responsible for Collection (of collectors)	91
No. where Men and Women Responsible (of collectors)	6
No. where Women Responsible for Collection (of collectors)	3
No. of Families Selling Grass	2
Main area of purchase	Local community

The tables above clearly indicate the quantitative, detailed nature of the data that was produced from questionnaire analysis.

7.3.1 Extended Questionnaires

In some cases the questionnaire interview was extended in order to provide additional information. For example, one question related to the length of time that families had been absent from the area during the conflict period. This question required a specific answer stating the number of month or years. However, if an individual was willing to talk, questions may also have been asked about where the family had been during the war and how they survived there. This provided valuable data that added context to the closed questionnaire questions.

7.3.2 Sampling

As mentioned previously, the sample technique used when carrying out questionnaire surveys is important as it affects the quality, accuracy and level of representation of the data. Problems were experienced in Nhambita in acquiring a scientific random sample for the questionnaire. This was due to lack of information about the area. The number of people living in the community (according to the 1997 census) was 612, divided into about 100 families. However, there were no maps showing the different areas within the *Regulado* and the population dispersal within each area³. It was however, known that the population was relatively homogenous in terms of lifestyle and also that there were three zones within the *Regulado*.

In order to ensure the survey was carried out as scientifically as possible the *Regulo* was consulted and asked to rank each of the three areas within the *Regulado* in terms of population density. The number of questionnaires carried out in each area was then calculated so that it was proportionate to the estimated population of each area. Attempts were made to implement the questionnaires in a random manner, though this was difficult due to lack of information regarding the spatial distribution of households. Traditional leaders in each zone were therefore contacted to provide information regarding housing distribution in the zone and an attempt was made to cover the area as representatively as possible.

However, as the questionnaire was not based on a scientifically rigorous sampling strategy, the validity of the results can be questioned. This highlights one of the difficulties associated with questionnaire surveys. This is especially so in developing

countries where maps and statistics are not available. Robson (1993:142) argues that this situation is not uncommon, stating that “*the exigencies of carrying out real world studies can mean that the requirements for representative sampling are very difficult, if not impossible, to fulfil*”.

³ The fact that the census had been carried out during the year the research was carried out, and that the information was held by the *Regulo* was fortunate. In subsequent studies, the *Regulos* did not always have accurate population data and could not even estimate the size of the population, further decreasing the possibility of having a satisfactory random sample and of carrying out a questionnaire survey accurately and scientifically.

7.3.3 Summary

Several problems were experienced in terms of preparing and implementing the questionnaire study. Though a general field visit had previously been carried out in the area of GNP, this did not include visits to any of the communities in the area, including Nhambita. Lack of logistical support made it impossible to carry out either a preliminary visit to the area or a pilot test of the questionnaire study. This was not problematic when carrying out the PRA, RRA and anthropological studies because, due to their flexible nature, these activities could be arranged and organised relatively easily within the community.

However, the questionnaire was developed without any first hand knowledge of the community, and implemented without the benefit of a pilot test. Issues to be explored therefore had to be anticipated prior to arriving in the field. This led to problems particularly when the response to a question did not have an appropriate category box to tick. For example one question required information regarding the care given to newly planted trees. Responses included 'giving water', 'giving compost', 'giving pesticide' or 'erecting a fence'. However, some families did nothing to protect the tree at all and others cleared the area daily to keep pests away, but these categories were not represented.

The questionnaire also did not allow for 'yes, but...' answers. For example, when enquiring about the main source of income, the answer box was ticked according to whether income came from sale of livestock, sale of excess crops, etc. However, for many families the answer was not as simple as this. For example, the main source of income after harvest could have been from sale of crops, but during the hungry season it was from sale of chickens and goats. During the planting season it may have been from part-time work on another *machamba*.

These problems were no doubt a result of deficiencies in the questionnaire, but they highlight the value of gaining knowledge about the community and carrying out a pilot study to ensure that the questionnaire works, prior to commencing the research. This would allow the appropriate range of answers to be included in the questionnaire. Arguably, an anthropologist with detailed knowledge of a community would be the most appropriate person to write a questionnaire. Alternatively, an open-ended questionnaire could be written with responses that were coded at a later date.

In order to reduce this problem while in Nhambita, a separate category was added to many questions in the questionnaire. This was the 'other' category, in which answers were put when they did not fit any of the categories included by the researcher. Researcher assistants were however instructed to explain the 'other' category so that if necessary another code could be given to a frequent answer.

The number of assistants completing the questionnaires also appeared to affect the quality of the data collected. Two assistants were used in the Nhambita study, initially working with the researcher, then independently. A teaching session was held whilst in the field to discuss interview techniques and the questionnaire itself. However, when examining returned questionnaires completed independently, it became apparent that the assistants had interpreted certain questions incorrectly. With a larger team it is envisaged that this problem would be exacerbated. Constant checking of completed questionnaires was needed to ensure they were correct.

It was generally found that the questionnaire survey results confirmed the data that had already been collected through observation. The added benefit was that it provided a level of quantification to the observations. However, in some cases the quality of the information was very poor or wrong altogether. For example, one of the questions related to hunting activities and only two families (4.6%) admitted hunting. However, observations carried out in the area indicated that this was likely to be a gross underestimation of the amount of hunting that took place (see section 7.4.1). This demonstrates how questionnaires only identify what people say they do rather than what they actually do. Though the questionnaires were carried out during the latter part of the fieldwork, this short period of time was insufficient to develop trust with members of the community so that reliable and accurate information would be provided.

Using questionnaire surveys was found to be very time consuming. Preparation of the questionnaire, including processing and photocopying took approximately three weeks. Preparing the database, inputting and interpreting the data after the study took a further 8 weeks. A pilot study would have further elongated the study period. A questionnaire study therefore involves a great deal of additional work. This was frustrating as the results of the questionnaire merely appeared to confirm data that had already been collected using the other techniques.

If the Nhambita study had been carried out using questionnaires alone, a large amount of detailed information would have been collected. However, the level of accuracy or indeed relevance, would

have been questionable. As the questionnaire was completed prior to any knowledge of the community, it only explored issues considered to be important by the researcher. These may have borne very little resemblance to the reality of the situation as perceived by the local community. Using other techniques in addition to the questionnaires allowed other important issues, as defined by the community, to be explored.

Also, if using questionnaires alone, there would be no opportunity to cross-check information through observations. In a traditional closed questionnaire any observation that did take place when the questionnaires were being filled in, would have no place where it could be recorded or used.

Finally, whilst it is important to write a report appropriate to the needs of the commissioning agency, it is also important to construct a report that is stimulating and visually interesting. The report will then be accessible to a wide audience, hopefully increasing its impact. It was found however, that questionnaire data could only be presented in a limited number of ways (usually in tables).

7.4 Findings from Anthropology

Anthropological investigations mostly involved detailed participant observation with associated measurements. Such measurements have been classed as anthropology as they could not have been carried out during daily visits to the community but required the research team to remain within the community for an extended period. For example, some measurements involved walking long distances or could only take place over several days.

Participant observation involved carrying out research as both a ‘participating observer’ and an ‘observing participant’. However, the majority of activities were carried out as a participating observer (see section 6.1.3). The research team therefore lived in the same place, in the same conditions eating the same food as the local population. However, the researcher mostly observed activities rather than becoming directly involved. Observation of activity was sometimes planned (for example, a trip with the women to the mill) or unplanned, which usually involved the researcher unexpectedly coming across an interesting activity and stopping to observe.

Participant observation enabled the collection of data on many topics including hunting activities, gender division of labour, daily activities around the homestead, fuel gathering techniques, water collection, identification of kiosks and related retail activity, agricultural activities, forest activities and milling activities. Associated measurements involved recording the distances and time taken to reach services such as the mill, health post and school and the collection of resources such as fuelwood and water. Quantities were also measured of the amount of grain taken to the mill and the amount of fuelwood and water collected. The frequency of such activities was also recorded.

Participant observation and associated measurement activities will be discussed in greater detail below and specific examples and results will be used in order to demonstrate the usefulness of such techniques. The chapter will conclude with a summary of the advantages and disadvantages associated with the use of anthropology and participant observation.

7.4.1 Observation of Hunting Activities

Hunting is permitted for subsistence purposes within the buffer zone of GNP. However, the legal knowledge of many communities throughout Sofala Province in terms of hunting regulations is very poor. In the buffer zone this problem is exacerbated because people believe they are not

allowed to hunt as the area is subject to certain restrictions. It was therefore anticipated that hunting activities would be a difficult topic to investigate.

Though the questionnaire, PRA and RRA techniques were used to investigate hunting activities, it was anticipated that, given the sensitivity of the subjects, there would be a difference between what people said they did (their attitude) and what they did in reality (their behaviour). This can happen in many cases and can be intentional or unintentional⁴. When directly questioned the majority of people denied being involved in hunting activities and it is believed that this information was intentionally false. Information was however, given freely about hunting techniques and members of the family who are responsible for the activity.

Participant observations, however, indicated that information regarding the number of people involved in hunting activities was false. For example, snares were seen hidden on *machambas* and a hunter was sighted one morning walking through the *Regulado* with a bow and arrow slung over his shoulder. As the research assistants became increasingly friendly with the local population they also reported stories that they had been told about numerous hunting activities.

Such observations would have been missed if the research team had not lived within the area. With questionnaires and to a certain extent PRA, there is no way of checking whether people actually do what they say they do. Observation facilitated through anthropological techniques allows the researcher to check whether behaviour matches attitude.

7.4.2 Observation of Homestead and *Machamba* Activities

Observation of the homestead and *machamba* produced interesting data. On the homestead, observations were made of the housing layout and building materials, storage techniques and grain preparation, cooking activities, interpersonal relationships, socio-cultural activities, spiritual activities and roles of various family members. As much of the observation took place on the homestead of the *Regulo* where the base-camp was established, the opportunity also existed to observe the *Regulo* in his official role as community head, where his duties included conflict resolution and ceremonial leader. On the *machamba*, observations included the types of tools used,

hours of work and groups involved in the work, types of crops, variety of pest and methods of control.

Observations provided both new information and the opportunity to cross-check and triangulate existing information. Observations for example, helped clarify one issue relating to daily activities. Enquiries were made into the time women start work each day and one woman reported rising at 5am to start work on the *machamba*. The following morning the researcher arrived at 5am to observe activities and found the women on the homestead were still asleep. They continued to sleep for a further 90 minutes. It was explained later that women only rise at 5am in the busy planting season prior to the rains, at other times during the year it is normal to sleep later.

Moris and Copestake (1993:47) examine the case of contradicting evidence in more detail. They state that “*the discrepancies provide useful hints that lead to synstudy and to deeper insights. Dividing available resources between more than one method therefore often results in more reliable and insightful data*”. Certainly if the two techniques of data collection had not been used the information would have been inaccurate and insights into activities that change according to the season would have been missed.

Several problems were identified however, while carrying out participant observation on *machambas* and homesteads. Initially, attempts were made to observe activities on a homestead where a young woman and her child lived mostly alone (her husband worked away during the week). However, these attempts were not very successful. The presence of the researcher appeared to alter the behaviour of the young woman and her associates and though observation was possible, it was felt that the researcher was tolerated rather than accepted.

This problem probably occurred because the study period was too short to enable a friendship to develop with the woman. It was also exacerbated by language difficulties and eventually further research with this woman was abandoned. However, this woman was probably not the best informant to select as she was relatively young, a newcomer to the area (through marriage) and did not have much confidence or status in a community setting.

⁴ Hanson (1980), in a review of forty-six studies, found twenty that did not demonstrate a positive relationship between attitude and behaviour.

More success was found on the *Regulo's* homestead, where the home-base was situated. After living with the community for a week or so, it was possible to sit, make notes regarding activities and be ignored after the first half an hour. The women on this homestead were however, the *Regulo's* wives and so had confidence and were well respected. They were more familiar with outsiders than other community members and so were not affected by the presence of a researcher. The drawback with this situation however, is that the *Regulo* was probably one of the richest members of the community, therefore his homestead was not necessarily representative of others in the community.

This emphasises the importance of selecting suitable informants and people to work with during an anthropological study. The quality of the informant undoubtedly affects the quality of the data. In a long study there would be ample time to select informants, however, in a four-week study it is important that such people are selected relatively quickly. In future studies older, more confident women were selected as working partners, with more success.

Assuming the role of observing participant entailed becoming involved in activities such as digging on a *machamba*. This experience had advantages and disadvantages. For example, it was a useful experience in that it highlighted the physical difficulties of such work, but again, due to the short length of time in which the research was carried out the experience received much attention and altered the behaviour of those taking part.

Generally, the problems experienced carrying out participant observation were associated with lack of time. This prevented the establishment of trusting relationships with local people and acceptance from the community in general. In terms of being an 'observing participant' the researcher continued to represent a spectacle throughout the study. For this reason participant observation was generally carried out from a 'participating observer' perspective, as this appeared to reduce the attention.

It is debatable however, to what extent the behaviour of community members would ever be completely 'normal' in the presence of a researcher. Russell Bernard (1995:182) reports that "*after three decades of coming and going in Indian villages in Mexico, I still stick out like a sore thumb and have yet to become the slightest bit inconspicuous*". He argues that participant observation means that "*you try to experience the life of your informants to the extent possible; it doesn't mean*

that you try to melt into the background and become a fully accepted member of a culture other than your own” (ibid.).

7.4.3 Observation and Measurement of Grist Mill and Health Post

Many people in Mozambique are unfamiliar with formal measurements such as distance, time and weight. Time for example, is measured by indicating the angle of the sun. When ascertaining distances or time taken to walk to specific places, therefore mistakes can be easily made. Experience has also shown that communities may purposely mislead a researcher, for example into believing that the nearest services are a great distance away in order to attempt to gain assistance for the community.

Anthropological observation and measurement provided a useful means of calculating time, distance and weights and additionally facilitated the cross-checking of information. Community members were asked, for example, the distance to the nearest health post and grist-mill. The answer given referred to the amount of time taken according to the angle of the sun. The researcher then walked with the community on their next visit to each facility and observed the time taken to reach each place and the distance from the *Regulado*. When walking to the mill, the amount of grain carried by each person was also recorded.

The results of the measurements indicated that the community had overestimated the distance to each place and time taken to get there. However, the difficulties associated with reaching each place were not overestimated. Both involved a long walk (16 km (round trip) to the mill and 18 km to the health post) and reaching the mill involved wading through the waste deep Pungue River which had relatively strong currents even in the dry season. Table 7.7 indicates the weights carried by each person.

Table 7.7 Average Weights Carried to Mill and Characteristics of Carrier

Gender, Age & Other Characteristics	Weight of Maize Carried (kg)
Adult, female	25
Adult, female with baby	20
Adult, female with baby	20
Adult, female with baby	20
Child, female (11 years)	9
Child, female (9 years)	5
Child, female (7 years)	3.5

Such information could only be collected through anthropological activity and is of undoubted use when assessing, along with the community and donors, whether development activities should for example, involve the introduction of a grist mill or health post.

Water collection activities were also observed and measured. These included measurement of distances to the nearest water points, the amount of water carried and frequency of trips per day. Such measurements provide useful indicators regarding the need for development activities such as the construction of boreholes.

7.4.5 Observation and Measurement of Fuelwood Collection

A large amount of data regarding fuelwood was collected using anthropological techniques associated with measurement. Initially, observation took place into methods of removing fuelwood. It was noted whether wood was collected only from fallen trees and branches, whether branches were lopped from trees or whether living trees were cut.

Additionally, as the research team remained in the community for some length of time, it was possible to measure fuelwood collection frequencies and the weight of fuelwood collected each time for several families. From this, a series of calculations could be made to ascertain the amount of fuelwood used per person on a daily and annual basis. The annual volume of wood used per person and for the entire community could then be calculated. The following table shows the results of fuelwood observations and measurements.

Table 7.8 Fuelwood Data

Family members	Amount of wood (kg)	No. of days use	Tree species	Time taken to collect (mins)		Other Information
FAMILY 1 2 adults 1 child	22*	2	<i>Piliostigma thonningii</i>	Walking Collecting Total	40 20 60	Dead wood chopped from tree. Collected by one man.
FAMILY 2 4 adults 3 children	25	1	<i>Piliostigma thonningii</i>	Walking Collecting Total	20 10 30	Dead wood from cleared machamba. Woman carried 20Kg + child and breastfed baby at same time, man carried 5Kg.
FAMILY 3 6 adults 9 children	119	2	<i>Lonchocarpus capassa</i> <i>Albizia versicolor</i>	Walking Collecting Total	20 30 50	Dead wood collected from ground and chopped from trees. Women (1) and men (2) involved. Women carried 30-40Kg, men carried 40-50Kg. Women also gathered wild fruit.

*Any wood remaining from the previous day was taken into consideration during calculations. The number of days use was calculated through frequency of collection.

The data in Table 7.8 provides a wide range of information. This can be analysed to show the average amount of time taken to collect fuelwood and the average weight carried per person.

Table 7.9 indicates that the families observed all spent around the same amount of time (25-30 minutes) collecting firewood regardless of family size. As family size increases more people are involved in the collection of firewood and the weight of firewood carried by each person decreases.

Table 7.9 Total Time Taken to Collect Wood

No. People in Family	Time Taken to Collect Wood	No. Days Supply	Total Time per Day (mins)	No. People Collecting	Amount Carried per Person
3	60	2	30	1	11 kg
7	30	1	30	2	15 kg
15	50	2	25	3 – 4	15-20 kg
AVERAGE			28.3 mins		14.5 kg

The weights collected divided by the number of people in the family and number of days supply, result in the total amount of wood used per person per day as shown in Table 7.10 below.

Table 7.10 Total Wood Utilised (per person per day)

No. People in Family	Wood Collected	No. Days Use	Wood per Family per Day	Total Wood per Person per day*
3	22 Kg	2	11 Kg	3.7 Kg
7	25 Kg	1	25 Kg	3.6 Kg
15	119 Kg	2	60 Kg	4.0 Kg
AVERAGE				3.76Kg

*Children are calculated as utilising the same amount as adults

Though different amounts of fuelwood are collected, individual fuel use is very similar, ranging from 3.6 - 4.0 kg with an average of 3.76 kg per person per day. Using this average figure it is possible to calculate the average annual volume of wood used per person and per average family (with six members). The average volume depends on the density of the fuelwood, which varies according to species. In Table 7.11 below, three types of fuelwood species, each with differing densities, have been used to give the annual, average volume of fuelwood used per person and per family.

Table 7.11 Annual Volume of Fuelwood

Fuelwood Species	Density (Kg/m ³)	Annual Volume per Person (m ³ /yr)	Annual Volume per Average Family (m ³ /yr)*
<i>Lonchocarpus capassa</i>	770	1.8	10.8
<i>Piliostigma thonningii</i>	750	1.83	11
<i>Acacia Nigrescens</i>	1,100	1.25	7.5
Average		1.6	9.8

*Based on average family with 6 members

O'Keefe *et al* (1984) estimate that the average fuelwood needs per individual in Sofala Province range between 1.1 - 1.7m³/person/year. The average, shown in Table 7.11, is therefore within this expected range.

Using observation and measurement to investigate fuelwood activities provided detailed data that was both qualitative and quantitative. Such detail would be useful when planning forest management activities such as the introduction of social forestry.

7.4.6 Summary

Participant observation can provide useful information, especially when combined with measurements. Because of the nature of anthropological investigation, measurements could take place over several days if necessary, providing information that could not have been gathered using daily PRA and RRA activities or questionnaires. Using anthropology provided the opportunity to go into the community, personally observing and experiencing events. This facilitated gathering new information and the cross-check of information that was already known. It also gave an immediate impression of certain aspects of the community, including their problems (such as distances to services).

It has been demonstrated that anthropological techniques, though considered as essentially qualitative, can produce quantifiable data that is appropriate for use in policy development. Such data could be used at a later date as a baseline for further studies. For example, it could be used to identify whether the distance to collect fuelwood had increased one year after the original study. This data could also be used to test the effectiveness of any resource programme implemented in the area. It was also useful as a method of cross-checking information relating to distance and time.

Participant observation was found to be especially useful for identifying differences between what people said they did and what they actually did in reality (whether the difference was accidental or deliberate). This opinion is supported by Russell Bernard (1995:310) who argues that “*interviewing people gets at information about their attitudes and values and what they think they do. When you want to know what people actually **do** there is not substitute for actually watching them or studying the traces their behaviour leaves behind*” (original emphasis).

The difficulties associated with receiving unwanted attention from community members and altering their behaviour was difficult to avoid. However, it is considered that, in a longer study this problem would diminish. The role of observing participant appeared to attract more attention than the role of participating observer. Concentrating on being a participating observer and using older, experienced people as contacts proved beneficial.

Russell Bernard (1995:141) reports that “*as you become less and less of a curiosity, people take less and less interest in your comings and goings. They go about their business and let you do such*

bizarre things as conduct interviews, administer questionnaires, and even walk around with a stopwatch, clipboard and camera. Lower reactivity means higher validity of data". However, if we are to believe Wagley (1983:13) who argues that "*anthropologists are uncomfortable intruders no matter how close their rapport*", then being a curiosity is a situation that the researcher must accept and take into consideration when analysing data.

Anthropological studies are traditionally carried out over much longer periods than the Nhambita study. However, the information presented above demonstrates that it is possible to collect a large amount of useful data in a short amount of time. More information could undoubtedly have been collected if the time had allowed and participant observation would perhaps have been more successful in a longer study. However, having only a relatively short amount of time should not deter a researcher from using participant observation as the quality and quantity of information that can be collected is still substantial. Russell Bernard argues that "*whatever data collection methods you choose, participant observation maximises your chances for making valid statements*" (1995:142). Participant observation in Nhambita provided the opportunity to 'experience' the community and from it gather detailed, accurate qualitative and quantitative information.

8.0 CONCLUSIONS

Information was requested by the Wildlife Management Component of the GERFFA Project that would facilitate both the production of a policy document for the management and development of the buffer zone of GNP, and the introduction of appropriate development activities. An initial study was required so that the needs of local communities in the buffer zone could be identified. The aim of this study was to develop, implement and analyse a methodology for data collection in *Nhambita Regulado*, an area within the buffer zone of GNP.

Early within this study it was established that the top-down approach to development was flawed due to its centralised, technology orientated nature. This led to activities that were imposed on people by outside experts, with little consideration for their actual needs. A recent paradigm shift has led to a move away from the top-down approach towards participatory development. The needs and problems of local people are central to the participatory approach, which builds on indigenous knowledge so that development activities are appropriate.

It was also established that community studies needed to be carried out prior to the introduction of development activities. This is so that the needs and problems of the community can be identified and indigenous knowledge can be understood. The importance of local participation in the study was emphasised, because local people undoubtedly understand their needs and problems better than anyone else.

Four separate methodologies, including PRA and RRA, questionnaire surveys and anthropological techniques, were then examined in order to assess the advantages and disadvantages of each methodology. However, when selecting the methodology for the *Nhambita* study, it appeared that in isolation, none of these methodologies would provide the type of information needed. Consequently, a methodology was devised that involved using a combination of the four different methodological techniques, with aim of maximising the advantages of each technique and minimising the disadvantages.

The *Nhambita* field-study was carried out over a period of one month, after which data was analysed and a report produced for the Wildlife Management Component. Selected examples of the results of the study have been used in this study to highlight the advantages and disadvantages found when using each methodological technique.

The overall conclusion to this study is that the combined methodology was very successful in Nhambita *Regulado*. A broad range of reliable information was collected within a short period of time. Individual conclusions will be examined in greater detail below, under separate headings.

8.1 Cross-checking and Triangulation of Data

Using several different methodologies facilitated cross-checking and triangulation of data. This was of importance in reducing errors and ensuring accurate information. Robson (1993:290) argues that triangulation is one of the main advantages of using multiple methods in social research as this averages out the level of error. The value of cross-checking and triangulation has been indicated many times within this study, for example, in relation to hunting activities (Section 7.4.1) and health indicators (Section 7.1.7). Moris and Copestake (1993:2) argue that “*if equally valid versions of the same reality may be arrived at by different methodologies, practitioners should recognise the value of using more than one method of enquiry (triangulation) and the need to tailor methods of enquiry to specific purposes*”.

According to Robson (1993:290) “*using more than one method in an investigation can have substantial advantages...one important benefit of multiple methods is in the reduction of inappropriate certainty. Using a single method and finding a pretty clear-cut result may delude investigators into believing that they have found the ‘right’ answer. Using other additional methods may point to differing answers which remove specious certainty*”. This was apparent from investigations relating to women’s daily timetables (see Section 7.4.2).

8.2 Complementarity of Methods

Rather than one method proving more appropriate than the others, it was found that the various techniques were complementary. In some cases certain methodologies produced information that could not have been gained from any of the other techniques. For example, data collected from questionnaire studies provided a level of detail that could not be easily obtained from any of the other techniques.

Russell Bernard (1995:16) sums this up by stating that “*quantitative studies focused attention on aggregates rather than on individuals*”. The benefit of using RRA, PRA and anthropological techniques, in addition to questionnaires, is that such techniques provide exploratory and descriptive data that can highlight and enrich quantitative data results. Such techniques can provide specific information, focusing on individuals rather than aggregates. By using a combination of techniques, information ranges from the general to the specific.

Using a variety of methodologies provided the enquiry with a level of flexibility, enabling issues to be examined in greater detail and allowing community members to explore topics that they considered as being important. The researcher was also allowed a level of reflexivity as data from PRA and RRA and anthropological techniques could be analysed in the field. Issues needing further enquiries could be identified and activities developed in order to investigate them.

8.3 Quantitative and Qualitative Information Mix

Moris and Copestake (1993:2) argue that “*qualitative and quantitative methods of enquiry are complementary*” and the Nhambita study appeared to confirm this. By producing qualitative and quantitative data, results from the study were based on both the opinions and judgement of the researcher and the relatively objective findings of the questionnaire survey. Observations were used to verify the quantitative data and *vice-versa*. This provided a useful cross-checking technique. Russell Bernard (1995:1) argues that “*whatever our theoretical orientation, a sound mix of qualitative and quantitative data is inevitable in a study of human thought and behaviour*”.... “*Qualitative and quantitative data inform each other and produce insight and understanding in ways that can not be duplicated by either approach alone* (ibid:142).

However, qualitative data was found to be restrictive in that it did not provide the numerical data preferred by policy makers. For example, from qualitative interviews and observations in Nhambita it was possible to state that ‘*the majority of people use wood for construction purposes and a large number of the population collect the wood from the forest area*’. However, results from the questionnaire study could be used to make the following statement: ‘*93% of people in Nhambita use wood for construction purposes. 69% of those using wood collect it from the forest area, 20% purchase and 11% both collect and purchase the wood*’ (see Table 7.5).

Whilst both statements are equally valid, the second statement confirms the findings of the first and adds more information. This highlights the limitations of PRA, RRA and anthropological techniques. Accordingly, Russell Bernard (1995:287) argues that “*survey research is generally better suited to policy research than participant observation*”.

However, it is also true that questionnaires could not produce the type of information required for descriptive activities and analyses. Russell Bernard (1995:105) for example, argues that “*descriptions of processes (e.g. the preparation of wild forest roots for eating⁵) ... or of events (e.g. ceremonies)... or of systems of nomenclature (e.g. tree or medicinal plant names) require words not numbers*”. Qualitative techniques are necessary for such descriptions.

In addition to the questionnaire survey, quantitative data was also collected using other techniques. This included ranking used in PRA, measurements of indicators in RRA and measurements associated with anthropological techniques.

Perhaps a salient point here is that whatever methodology is used, it must be suitable for the purpose of the research. Qualitative and quantitative methodologies can be considered as different techniques, each of which is applicable in certain situations depending on the type of information that is required. Table 8.1 summaries the techniques and activities that were found to be useful in relation to the investigation of specific issues in Nhambita.

⁵ Examples provided from Nhambita research.

Table 8.1 Information Needs and Methodology

Information	Methodology
Background	<ul style="list-style-type: none"> • RRA – reading, maps, photographs, ask experts • PRA – timeline
Environmental/Geographical	<ul style="list-style-type: none"> • RRA – observation and transect walk • PRA – resource map
Perceptions, Values and Attitudes	<ul style="list-style-type: none"> • RRA – interviews and focus groups • PRA – spidergram of problems
Behaviour (what they say they do)	<ul style="list-style-type: none"> • PRA – spidergram, seasonal calendar • RRA – interviews and focus groups • Questionnaires
Behaviour (what they actually do)	<ul style="list-style-type: none"> • Anthropological – participant observation and associated measurement • RRA – measurement of indicators

8.4 Traditionally Problems Associated with Questionnaires and Interviews

Robson (1993:191) highlights some of the problems traditionally associated with questionnaires and interviews by arguing that “*interview and questionnaire responses are notorious for discrepancies between what people say that they have done, or will do, and what they actually did or will do*”. Carrying out questionnaires and interviews in conjunction with other techniques (such as observation), facilitated cross-checking and allowed such discrepancies to be identified and explored. This helped to minimise the disadvantages associated with questionnaires and interviews.

Robson (1993:125) goes on to state that surveys can be seen as “*generating large amounts of data of dubious value. Falsely prestigious because of their quantitative nature, the findings are seen as a product of largely uninvolved respondents whose answers owe more to some unknown mixture of politeness, boredom, desire to be seen in a good light etc, than true feelings, beliefs or behaviour*”. It was envisaged that living within the community would raise awareness of the issues that were being explored during the study and would therefore draw ‘uninvolved respondents’ into the research.

It was also envisaged that living within the community prior to carrying out the questionnaire would allow some degree of trust to develop between the community and the research team, thereby increasing the quality and reliability of data. However, though a level of trust was established with certain members of the community, the time-scale was too short to development trusting relationships, or even familiarity, throughout the community.

8.5 Time Scale

One of the most important aspects of this, or any study, is the time-scale allowed for the completion of research. This study had to be completed relatively quickly in order that results would be available to the Wildlife Management Component. If the study had been completed using only one or two techniques, it would probably have been possible to complete the fieldwork in a shorter period of time. However, the additional time improved the quality and reliability of the data.

Nevertheless, one month is however, a very short time in which to carry out any level of anthropological study. Russell Bernard (1995:106) however argues that “*a lot of applied anthropological research is now done in weeks or months, rather than in years, using rapid assessment methods...the same methods that everyone else uses but done quickly*”. This involves “*going in and getting on with the job of collecting data without spending months developing rapport. This means going into a field situation armed with a list of questions that you want to answer and perhaps a checklist of data that you need to collect*” (ibid:139).

However Russell Bernard also claims that “*it takes at least 3 months to achieve reasonable intellectualised competence in another culture and be accepted as a participant observer, that is, as someone who has learned enough to learn*” (ibid:151). In this case, a one-month research period can be considered inadequate to carry out participatory development.

However, the learning curve associated with working in a new environment is arguably most acute during the first month of research. Russell Bernard (1995:106) argues that “*anthropologists who stayed in the field for at least a year were more likely to report on sensitive issues like witchcraft, sexuality, political feuds, etc.*”. Though such issues are important, they arguably do not need to be immediately understood in their full complexity to ensure the success of development activities.

Although the findings from the Nhambita study cannot be compared with the detailed findings of an anthropological study carried out over years, it is argued that it is possible to collect a significant amount of reasonably reliable information in one month. There are however, other areas where data must be collected in Nhambita prior to the introduction of development activities including detailed needs assessments and feasibility studies. It is envisaged that such studies will involve ongoing participatory work with the community.

9.0 Limitations of Study

The limitations associated with this work relate mainly to the period of fieldwork itself and are as follows:

- Logistical and budget constraints, resulted in the study being performed in only one area without the benefit of a pilot study. Nhambita was selected as a representative area, however, the study would have benefited from at least several short PRA studies in other areas.
- The researcher did not speak fluent Portuguese or any Sena.
- The research assistants did not speak fluent Sena.
- It was not possible to work with and train assistants prior to commencing fieldwork.

10.0 Further Research Issues

The possibility for further research might focus on the development of a multi-disciplinary suite of techniques for development based research activities. This could include the formulation of a manual for development practitioners.

11.0 End Note

The report from the Nhambita Study was completed early 1998 and was distributed both internally (to GERFFA and the Ministry of Agriculture) and to other NGOs operating in the area. It provided a contrast to reports produced by other NGOs working in the area who, in response to the demands of international donors, typically produce highly standardised and quantitative reports. It was hoped that the report would provide baseline information to assist other organisations planning to commence activities within the buffer zone.

The report has been used by a private company that has recently commenced forestry activities in Nhambita *Regulado*. In this context, the report was used as a basis to develop initiatives in which the community and private sector could work together as equal partners.

The Nhambita report has also led to the initiation of a series of development activities. This began with a school tree programme to raise the awareness of children to the importance of trees in the environment. Certain areas were also identified in relation to the PIP. These included the possible introduction of a grist mill and oil press and the development of the site of the mill to form a small roadside market. Additionally, GNP plans to become involved in the transportation of excess agricultural products to wholesalers. However, these projects are still being formulated with the community through a series of detailed community needs assessments and feasibility studies.

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