The use of indigenous trees by local communities within and surrounding the Thukela Biosphere Reserve,

with an emphasis on the woodcarving industry.

by

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ABSTRACT

In the past, protected natural areas have excluded local communities from the land and denied them access to valuable natural resources. However, it is becoming accepted practice to ensure that neighbouring communities benefit from the conservation of these areas. In accordance with their neighbour relations programme, the Natal Parks Board initiated a study to establish the need for indigenous wood in the region of the Thukela Biosphere Reserve (TBR), particularly for the woodcarving industry, and to determine sustainable methods and levels of harvesting. Part of this study was to determine the socio-economic issues surrounding the woodcarving industry and other users of indigenous trees, and these are addressed in this thesis.

A multidisciplinary approach was adopted to address as many aspects of natural resource use as possible. The principle of sustainable development was employed to explore the nature of the often complex relationships between local communities and protected areas, and local communities and natural resource use. This principle calls for the integration of social, economic and ecological issues, with special attention to the notions of futurity, equity and the environment. The biosphere reserve is considered to be an appropriate vehicle for achieving sustainable development and the sustainable utilisation of resources, both internationally and in the South African context. However, in practice there are many obstacles to overcome as was observed in the case of the TBR, where security of land tenure and the associated control of and access to natural resources are a source of major conflict in the area.

In view of this conflict, a flexible and sensitive methodology that promoted rapport-building was selected, namely Rapid Rural Appraisal (RRA). Mainly verbal RRA techniques were used to gather information on the use of and demand for indigenous trees by the local communities residing within and surrounding the TBR. This information included species names, species uses, estimations of quantities harvested, perceptions of the resource base, conservation practices and harvesting techniques, economic relations, constraints, and relationships between the resource manager and the resource user.

Indigenous trees were found to be an important resource for fuel, construction, medicine, carving, and to a limited degree, food, to local people living within and surrounding the TBR. The predominant uses of wood were for fuel and construction materials. Access to these resources varied, depending on the area or farm where people resided. People living in degraded areas outside of the TBR experienced great difficulty in harvesting wood for fuel or building, and either harvested it illegally off privately-owned land or purchased it at great cost. Generally, it was found that on farms where there were very few families present, residents were allowed greater access to wood compared to those living on farms where many families resided. There were also specialist users living in the area, namely traditional healers and woodcarvers. Limited information was collected on the medicinal use of trees. However, the preliminary data suggests that there is a great need for this resource. It was found that there are very few woodcarvers present in the study area. As the carving industry was the original focus of the study, detailed information was collected from these men. It was found that carved products are largely produced for local markets and included traditional weapons and traditional household implements such as meat trays and spoons. Carvers were finding it increasingly difficult to access wood, and the income they derived from this trade was supplementary.

Although it is not perceived possible that the indigenous wood requirements of all local people in the area can be met by the resources within the TBR on an ongoing basis, management of bush encroachment may increase the supply of firewood and construction materials, especially to those farm residents who were experiencing difficulty in this regard at the time of the study. Through partnerships with more specialist users of indigenous trees such as woodcarvers and traditional healers, access to these resources too may be improved. Although more detailed and participative research is needed before substantiated management plans can be formulated, it is hoped that through this study a foundation will be laid to direct future research efforts, dispel misunderstandings, and be part of the effort required to ensure sustainable development of natural resources.

PREFACE

The research described in this thesis was conducted at the Department of Geographical and Environmental Sciences, University of Natal, Durban, during 1995 as part of a course-work Masters degree. The work was supervised by Dr W.N. Ellery.

This thesis represents original work by the author and has not been submitted in any form to another university. Where use has been made of the work of others, it has been duly acknowledged in the text.

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CHAPTER 1

INTRODUCTION

1.1 General background

In the past, protected natural areas were set up exclusively to protect nature (species, habitats, ecosystems), often at the expense of local people who were living on the land and dependent on local natural resources. The emphasis on management was preservation. However, it is becoming more accepted that local inhabitants should also be involved in the establishment, management and utilisation of these conservation areas, and that local community participation is in fact essential for the perpetuation of protected natural areas and for achieving sustainable development (Holmberg and Sandbrook, 1992).

It is not advocated that protected areas are mined of their resources, but rather that the local people benefit from the conservation of the area, either indirectly through money generated through tourism, or directly through the sustainable utilisation of resources found within protected areas such as food, medicine, fuelwood, grazing, water, building materials and/or craft materials. Many of these natural resources have significant cultural, subsistence and/or commercial value (Cunningham, 1985) and have become unavailable either due to overexploitation or by being locked up in protected areas. Often a combination of both factors exists as many inaccessible protected areas which are rich in natural resources, are surrounded by densely populated, resource-poor communities. Allowing for controlled utilisation of natural resources in protected areas could aid in alleviating poverty in many of these rural communities, and ultimately aid in achieving conservation and sustainable development goals.

Protected conservation areas exist in numerous forms and enjoy various levels of protection (Hanks and Glavovic, 1992). In South Africa there are national and provincial conservation areas, joint ventures between the state and private owners, as well as communally and

privately controlled areas. Laws regarding the ownership of wildlife vary in each province and are vested in the relevant provincial conservation bodies (Cowling and Olivier, 1992; Bothma and Glavovic, 1992). Despite the varying levels of protection, few statutory reserves permit direct resource use of natural resources within their borders. One of the roles of biosphere reserves is to integrate conservation and resource use, and thus allow for the involvement of local communities in the utilisation and management of natural resources. Developed in the 1970s, the biosphere reserve concept is envisaged as a means of integrating conservation and development goals. Although there are no internationally recognised biosphere reserves in South Africa at present, at least two biosphere reserves exist in name, and several are being planned.

The Thukela Biosphere Reserve (TBR) in the Weenen district was established in 1993 by a group of white farmers in association with the Natal Parks Board (NPB). It presently comprises 22 members, one of which is the NPB. In view of the objectives of biosphere reserves in general, and as part of its neighbour relations policy, the NPB initiated this study to determine the feasibility of promoting a woodcarving industry within and surrounding the TBR. In order to make recommendations for the sustainable utilisation of any natural resource, it is necessary to establish both the socio-economic dynamics of the resource users, their relationship with the resource managers or landowners, as well as to determine the size, distribution and productivity of the resource base.

1.2 Aims and objectives of the study

This study is part of a broader study which aims to establish the need for indigenous wood in the region of the TBR, particularly for the woodcarving industry, and to determine methods and levels of harvesting that are sustainable. The specific aim of this study is to determine the socio-economic issues of the woodcarving industry and other users of indigenous trees.

The specific objectives of this study were to:

- identify the extent and level of carving skills within and surrounding the TBR;
- identify constraints, if any, in practising these skills, and explore means to alleviate constraints;
- measure the economic potential of the industry and predict the limits to its expansion;
- identify preferred indigenous tree species for carving, their conservation status, and possible alien woody species substitutes;
- determine the availability of preferred species to each local community as perceived by the woodcarvers themselves;
- determine traditional harvesting techniques, and preferred size classes of trees;
- estimate the volume of wood consumed;
- identify all other users of indigenous trees and determine their needs;
- evaluate traditional and other conservation measures imposed on the users of indigenous trees by the resource managers[1]; Zulu custom and the tribal and community authorities; and
- provide recommendations for the allocation and sustainable utilisation of indigenous tree species for the woodcarving industry and other users within the TBR.

The information collected, and recommendations made, in response to these objectives should be viewed as an initial assessment of indigenous trees that will aid in directing future

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[1] The members of the Thukela Biosphere Reserve (farmers and the NPB).

research, dispel misunderstandings that appear to be present among various interest groups, and stimulate meaningful interaction between resource managers and resource users towards substantiated management plans for the sustainable utilisation of indigenous trees.

As mentioned, there are 3 other component studies simultaneously being undertaken. These studies propose to:

- assess the attitudes of TBR members, farm residents and neighbouring communities towards the TBR and the utilisation of natural resources in general;

- assess the size, geographical distribution, and productivity of the indigenous tree resource base within the TBR; and

- integrate all the information generated in the project, together with existing relevant information of the area, in a Geographical Information System (GIS) and assess the appropriateness of GIS as a management tool for natural resource utilisation.

It is hoped that together these projects yield sufficient information to formulate recommendations for the sustainable utilisation and allocation of indigenous tree species for the woodcraft industry and other indigenous tree users within the TBR. This study is by no means prescriptive, but should be seen as a foundation on which to build a meaningful working relationship between resource users and resource managers, recognising the fact that this relationship is essentially built on compromises of conservation and local people's aspirations. This compromise has the potential to aid in the resolution of some of the conflict that exists in the area, bearing in mind that much of the conflict is rooted in the imbalance in access to natural resources.

Feedback (verbal and written) with regard to the research findings and recommendations will be provided to the NPB, the TBR members, woodcarvers and other indigenous tree users who are farm residents and members of neighbouring communities.

1.3 The content of this thesis

The theoretical framework for this research project is multidimensional which is indicative of an ever increasing multidisciplinary approach towards research and development. Firstly, the principle of sustainable development is employed as a broad framework to address more specifically, the nature of the relationship between people and conservation areas, and people and natural resources. The concept of biosphere reserves is explored as one way of achieving sustainable development (Chapter 2). Secondly, a methodological framework is explored which attempts to overcome outsider biases inherent in a large proportion of research, and to promote a more explicit ethical framework for research and development (Chapter 3).

Chapter 4 describes the biophysical and social characteristics of the study area, particularly those believed to have an impact on the project design, the quality and quantity of information collected, and the recommendations that can be made regarding the sustainable utilisation of indigenous trees. The findings of the study have been divided into those relating to woodcarving (Chapter 7) and other uses, such as construction materials, fuel, medicine, and food (Chapter 8). This division is due to the original focus of the study, namely the promotion of a woodcarving industry in the Weenen area. As a result, more detailed information, particularly regarding the economic value and potential of the industry, was collected for woodcarving compared to the other uses. The methodology used to elicit this information is described in Chapter 5, including the circumstances that led to the selection of the specific techniques employed. The significance of indigenous trees to rural Zulu communities is presented in Chapter 6 in order to place the findings of this study in the context of other studies, as well as to promote an understanding of the cultural, social and economic value of indigenous trees used by local communities in the Weenen area.

Chapter 9 attempts to draw together the sustainability principle and biosphere reserves with the findings of this study, in order to provide recommendations towards the sustainable utilisation of indigenous trees in the TBR. The final chapter (Chapter 10) assesses the role

of a researcher in resource management, and suggests a redefining of this role, extending beyond ecological principles to include social and economic issues as well.

CHAPTER 2

SUSTAINABLE DEVELOPMENT, NATURAL RESOURCE UTILISATION AND BIOSPHERE RESERVES

"Earth has resources for everyone's need, but not for everyone's greed" Mahatma Gandhi.

2.1 Introduction

The theories and ideas underlying natural resource use are diverse, and include both a human and ecological dimension. In this chapter, the sustainable development principle is employed as a broad framework to examine the relationship between local people and protected areas in terms of natural resource utilisation. More specifically, the biosphere reserve concept is explored as one way of achieving sustainable development and providing a vehicle for the sustainable utilisation of natural resources.

2.2 Sustainabilty and sustainable development

Sustainability has been defined in the Second World Conservation Strategy as "a characteristic of a process or state that can be maintained indefinitely" (IUCN, UNEP and WWF, 1991). The pursuit of sustainability has arisen out of the realisation that the world's resources are finite, and nature's capacity to regenerate resources and absorb waste is limited. A balance of human population growth and its associated consumption of resources, with the finite size and resource capacity of the earth, is necessary (WWF, 1993).

More specifically, the sustainability principle can be applied to development. **Sustainable development** has come to mean many things to many different groups of people and there are about 70 definitions in circulation (Holmberg and Sandbrook, 1992). It generally refers to

"development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). It has also been defined slightly differently as "improving the quality of human life within the carrying capacity of supporting ecosystems" (IUCN, UNEP and WWF, 1991).

Barbier (1987) identifies 3 systems fundamental to the process of development. These are the biological or ecological resource system, the economic system and the social system. A set of goals is attached to each of these systems, each with its own hierarchy of sub-goals and targets. An objective of sustainable development is to simultaneously maximise these goals across the three systems by means of trade-offs. Not all goals will be maximised and there may even be intra-system conflict. Therefore choices must be made as to which goals receive greater priority, and different development strategies will assign different priorities. This model argues that for development to be sustainable, there must be overlap or interaction of the three systems, and that there will be trade-offs between and within the fundamental systems. These trade-offs must be adaptive so that priorities or emphases that are allocated to various goals can change over time in response to change in individual preferences, social norms and ecological conditions (Barbier, 1987).

There are several dilemmas related to the sustainable development principle. The first is the conventional perception of economic growth as the fundamental objective of development. It is not possible to carry on as before in a world that is reaching its capacity to support waste. Evidence of this can be seen in global warming, holes in the ozone layer, pollution of the atmosphere, land, rivers and oceans, and increasing rates of species extinction. Instead, the aim of development should be to increase the productivity of natural capital and to minimise waste (Holmberg and Sandbrook, 1992). Secondly, progress should not only be measured in economic terms, but an evaluation system should be sought that simultaneously measures the quality of sustainable development and the quality of life. Thirdly, it is necessary to determine the magnitude of trade-offs between conflicting environmental goals (Holmberg and Sandbrook, 1992). It will be shown that meeting these three goals is extremely difficult as there are many obstacles to overcome. In addition, there is no set method for achieving

sustainable development as its focus shifts according to prevailing values and ethical norms, location and time scales (Holmberg and Sandbrook, 1992).

However, one ingredient that is thought to be necessary to all sustainable development programmes is participation at community level. Holmberg and Sandbrook (1992) label this local participation at local level as "primary environmental care". It involves meeting basic needs (economic goal), protection and optimal utilisation of the environment (environmental goal), and the empowering of groups and communities (social goal). Although it is noted that primary environmental care will not be able to solve all environmental and poverty problems, there is sufficient experience to show that sustainable development will not be possible without the involvement and empowerment of the people for whom the benefits are intended (Holmberg and Sandbrook, 1992). To illustrate unsustainable development Holmberg and Sandbrook (1992) give the examples of maximum production of goods and services (an economic system goal) without regard to biological resilience, genetic diversity, social justice or participation; and maintaining wildlife habitats to preserve genetic diversity (a biological goal) by forcibly keeping poor people away without providing them with alternative livelihood opportunities.

2.3 Biosphere reserves

2.3.1 The biosphere reserve concept

One of the vehicles designed to implement sustainable development is the biosphere reserve which is one of ten categories of protected areas recognised by the IUCN's Commission on National Parks and Protected Areas. The concept of a biosphere reserve was conceived as a result of the 1968 UNESCO Conference on Rational Use and Conservation of the Resources of the Biosphere, and was formalised into the Man and the Biosphere (MAB) Programme. This programme aimed at reconciling utilisation with long-term protection through an interdisciplinary research approach and is thought to be "the

first deliberate international effort to identify ways and means of achieving the sustainable development of terrestrial ecosystems" (Batisse, 1993).

Fully-functioning biosphere reserves perform three main roles: (a) **conservation** of ecosystems and biota of particular interest; (b) establishment of demonstration areas for ecologically sustainable land and resource use (sustainable **development**); and (c) provision of logistic support for **research**, **monitoring**, **education** and **training** related to conservation and sustainability issues. This requires co-operation among resource managers, scientists, and local residents on activities directed towards priority issues of concern for each biosphere reserve (Francis, 1995). Although it is recognised that each individual biosphere reserve may place a different emphasis on these varying concerns, biosphere reserves should normally respond to each of these roles. The integrity of any proposed biosphere reserve is determined by UNESCO under the "Man and the Biosphere Programme" (MAB), and is recognised if the area is a good example of some of the ways in which conservation objectives can be balanced with development. Sustainable human interaction with the environment is thus integral to the functioning of the area.

The way in which the biosphere reserve concept attempts to combine conservation and development is by integrating :

- the protection of ecosystems and the biodiversity they contain (including genetic resources);
- research and monitoring of ecological and global change (including climatic, hydrologic and edaphic change);
- experimentation with and implementation of various forms of sustainable development for local people in rural areas; and
- environmental education and awareness (for both local people and visitors).

The integration of these objectives is achieved by careful zoning, one of the prominent features which sets apart the biosphere reserve concept from conventional protected areas. There are three types of zones which may be represented in several discrete areas of the

biosphere reserve . The **core** area is strictly protected to meet the conservation objectives: it is free from human settlement and has minimal human interference. The **buffer** zone is designated for management, research, education and monitoring purposes, to enhance the conservation status of core areas. The **transition** area of multiple land uses which can extend over the territory, is where co-operation with local people for sustainable development can be organised (Batisse, 1993). The designation of zoning is not addressed by merely drawing lines on a map nor is a management structure governing the management of these zones simple to formulate. This is because, unlike conventional protected areas with one administrative authority, biosphere reserves may have several.

2.3.2 Internationally recognised biosphere reserves

There are currently 324 biosphere reserves in 82 countries which cover a total area of 211 532 058 ha (MAB, 1994). Imperfect zoning, the lack of a management plan, and lack of co-operation with local surrounding populations are all cited as common weaknesses in many of these designated biosphere reserves. Other obstacles to successful integration of conservation and development goals, that are prevalent not only in biosphere reserves, but in all protected areas, include neglect from government authorities, insufficient protection and management facilities, lack of support from encroaching surrounding populations, improper enforcement of legislation and lack of trained personnel (Batisse, 1993). At present, the co-ordination and administrative mechanisms of biosphere reserves would appear to be informal and based on goodwill and mutual interest. However, it is noted that this type of cohesion may be insufficient for long-term success and a more formal type of management structure and legal status of biosphere reserves needs to be addressed within each country (Batisse, 1993). Despite these weaknesses, it is believed that because biosphere reserves attempt to combine conservation and development within a single but flexible framework, they will receive greater support in the future (Batisse, 1986; 1993).

2.4 Sustainable utilisation of natural resources

2.4.1 Definition of sustainable resource use

Sustainable resource use is "the method or process by which the concept of sustainable development is applied to the use of natural resources, renewable or non-renewable" in an integrated approach taking into account the functioning of entire ecosystems (WWF, 1993). It too must encompass environmental, social and economic dimensions which will overlap in various proportions according to differing local, regional, national and international circumstances. The subject of sustainable natural resource utilisation is especially relevant to rural areas in developing countries where dependence on natural capita is high. These areas are also often characterised by high human population growth rates, an increase in the proportion of the population experiencing poverty, and extreme environmental degradation (The World Bank, 1995).

2.4.2 Natural resources, property rights and traditional knowledge

One of the major factors influencing the utilisation of natural resources is the actual or perceived ownership of these resources or property rights. In the context of renewable natural resources, these issues are centred on property rights. In general, property rights can be classified as state property, where the claim rests with government, for example national or provincial protected conservation areas; private property, where the claim rests with the individual or the corporation, for example farms and game ranches; and common property or communal property, where individuals have claims on collective goods as members of recognised groups, for example tribal trust land (Gibbs and Bromley, 1989).

The latter category of common or communal property exists in both the formal western institutions of Anglo-Saxon common law and Roman Law, and more informal institutional arrangements based on custom and tradition (Berkes and Farvar, 1989). The attitude of

many natural resource managers to these more informal communal property arrangements and associated traditional knowledge[1] has frequently been dismissive. However, modern scientific knowledge is thought to have enjoyed too great a share of leverage compared to that enjoyed by the indigenous people and the value of traditional environmental expertise is rapidly gaining recognition. It is not suggested that the scientific approach to resource management should be renounced. Richards (1980) states that a "sentimental belief in "traditional values" and a conviction that "people know best" without knowing why and under what circumstances, will be ..... unhelpful". Wise and unwise environmental practices coexist in many, if not most cultures. The success of some traditional management systems may have been due to low population densities, and cannot be expected to solve today's resource management problems where demands on resources exceed their productive limits (Johannes, 1989).

2.4.3 The problem of gender inequality

Gender inequalities in terms of access to natural resources and a say in the management of these resources exist in many developing countries where women are generally unempowered and under-privileged (WWF, 1993). As the definition of sustainable utilisation of resources includes social sustainability, gender inequalities preclude the sustainable utilisation of resources from ever being achieved. In many developing rural areas, women are often more involved than men in the use of natural resources such as firewood, soils for cultivation, and water. Omitting women from the sustainability equation is contradicting the equity or social principles of sustainability itself.

2.4.4 Assessing natural resource supply and demand

On a more practical level, one of the factors restricting the sustainable utilisation of resources is the lack of accurate information regarding the size and regenerative capacity of

[1] Traditional refers to practices that have had historical continuity among a group of people (Berkes and Farvar, 1989)

the resource base. It is also difficult to quantify the demand for resources as selection criteria for natural resources are often complex; a learnt skill that is difficult to simulate. In addition, natural resource availability and the demand for natural resources are seldom static, especially with vast destruction of habitats taking place and an ever increasing human population. Without all this information it is very difficult for researchers and/or managers to plan, assess and monitor the success of a particular sustainable development programme. However, the researcher and/or manager needs to be aware of these difficulties, and acknowledge that a conscientious attempt to conserve natural resources and simultaneously promote development, even without all the necessary data, is better than no attempt at all.

2.5 Towards sustainable utilisation of natural resources in South Africa

2.5.1 Achieving sustainability in South Africa

The objectives of sustainable development, biosphere reserves and the sustainable use of natural resources all overlap to some degree. On paper, the attainment of sustainable development and associated utilisation of natural resources via the establishment of biosphere reserves appears deceptively simple. In practice, however, it is much more difficult to ensure, especially in countries such as South Africa where there are many poverty-stricken people in rural areas dependent on a dwindling natural resource base. Furthermore, land ownership is uncertain and inequitable. As resources in communally controlled areas begin to dwindle, people dependent on the resources are beginning to look at protected areas to provide solutions. However, due to the ever increasing demand it is recognised that all these needs cannot be sustainably met by merely supplying the resource in question. Instead, protected areas need to initiate innovative ways of satisfying these needs with the aid of other landowners and state finance, in order to justify their conservation efforts.

The biosphere reserve concept, which allows for the incorporation of state controlled conservation areas, can therefore be seen as an invaluable means of satisfying the needs of

rural people through a more extended and regional approach compared to that of isolated conventional protected areas. Although there are 324 functioning biosphere reserves in other counties (MAB, 1994), the potential of the biosphere reserve concept in the South African context has not been realised.

2.5.2 Biosphere reserves in South Africa

There are no formally registered biosphere reserves in southern Africa (MAB, 1994). Within KwaZulu-Natal, there are several that exist in name (NPB, 1994b) or are in the proposal stage (Preston-Whyte, 1995), but their actual functioning as true biosphere reserves is questionable. The Thukela Biosphere Reserve (TBR) is one of the more prominent of these areas and is the focus of this thesis. Describing the origins and present functioning of the TBR is considered useful in exploring the feasibility of establishing and maintaining such protected areas within the South African context.

The Natal Parks Board which is the administrative conservation authority in the province of KwaZulu-Natal, has published its interpretation of the biosphere concept in a document entitled "Guidelines for application of the biosphere concept in Natal" (Cook, 1993). The key objectives identified are to conserve biological resources; to perpetuate and learn from traditional forms of land use; to learn how natural systems work; to improve management of natural resources; to share knowledge; and to co-operate in solving natural resource problems and thus reiterate the conservation, logistic and development functions of the biosphere reserve concept as defined by the MAB programme.

2.5.3 The Thukela Biosphere Reserve

The Thukela Biosphere Reserve (TBR) is recognised and supported by the NPB, the NPB itself being a member. However, there is no biosphere designation in the NPB's list of protected areas in the Natal Provincial Ordinance 15 of 1974, nor is the TBR registered with the international MAB programme. The TBR does have its own constitution, and members are bound by the law of contract to this document (Bill, 1995). Objectives

pertaining to conservation, development and logistic objectives are provided, consistent with the biosphere reserve concept. However, vagueness in terminology and lack of clarity, especially in terms of who constitutes the "community" exist (Bill, 1995).

The TBR was founded in May 1993 by seven founder members and has a current membership of 22, although this number fluctuates as new members join and others resign. Members differ in terms of their economic well-being, their views on how and whether the TBR should be cohesively managed, as well as their expectations with regard to derived benefits. It is believed that the formulation of the TBR did not include black local people residing within or surrounding the TBR, and when it was made public knowledge, the TBR was seen as "a grave threat to any future land claims" by these people (Alcock, 1994). Local people residing within the TBR also fear the introduction of large game animals (e.g. rhinoceros and elephant) as part of the TBR initiative to promote tourism, as well as the possibility of forced removals to other areas of farms, or even the prospect of eviction from the TBR itself. In hindsight to solving these problems, the TBR has promoted the formation of the TBR farm workers' committee to voice the fears and aspirations of local people.

At present, there is no management plan for the TBR, although it is anticipated that one will be formulated during 1996. The TBR is currently operating in four units, under an umbrella committee. Block A is operated by the NPB, while Blocks B, C and D, are managed collectively by the landowners themselves. These areas cannot be seen to represent the zonation inherent to the biosphere reserve concept, even if Area A, the Weenen Nature Reserve is seen as the core area. The properties that are currently supporting game ranching and tourism may be viewed as the buffer zones but there are no clear transition zones designated to allow for sustainable development.

With the aim to develop most of the TBR for ecotourism, and an ethos that is continually evolving in accordance with specific local conditions, the functioning of the TBR as a true biosphere reserve has not yet been formalised. This process of blind experimentation may even result in an alternative sustainable development model. However, as long as the words

"biosphere reserve" are present in its title, the TBR will always be assessed in terms of the international concept of the MAB programme.

Ignoring for a moment the incompatibilities of the TBR to that of the MAB's concept of a biosphere reserve, the main obstacle to the success of the TBR is and was the lack of true meaningful negotiation with all local residents and neighbouring communities, both at its inception and currently during its development phase. Because of this, local people distrust the visions of the TBR and the benefits to the area that its members advocate. It is also unlikely that local people who will acquire land as part of the land reform programme within the present boundaries of the TBR will support its existence in the present form. This is inconsistent with the thinking that "the instrument for success is normally the adoption by all concerned of a management plan covering the whole area" (Batisse, 1993), and is an important lesson for all biosphere reserves, including those proposed in South Africa.

2.5.4 Land tenure and control of natural resources in South Africa

There are various forms of land tenure currently operating within South Africa and perceptions of ownership differ quite considerably. The main forms of land tenure are private, state, tribal, and freehold. Land allocation in South Africa in the past, has been skewed in favour of the white minority, while the rest of the population has been forced into a small proportion of the land which is relatively unproductive and marginalised (Sunter, 1992). The recently published Land Reform (Labour Tenants) Bill, 1995, and the Restitution of Land Rights Act, 1994, will enable the transfer of ownership of land from private and state owned land to certain labour tenants and former occupants of land. This transfer of ownership, while promoting equity and ensuring human rights, will present a new dimension to the utilisation and management of natural resources in rural areas as resource users become their own resource managers. Although the land reform programme will give people access to land, it will do little to fundamentally change their socio-economic status. As such they will have to continue to rely heavily on the natural resource base, and pressure on this resource base will therefore be much increased.

2.6 Conclusion

The biosphere reserve concept is thus considered to be an appropriate vehicle for achieving sustainable development and the sustainable utilisation of natural resources, both internationally and in the South African context. However, there are many obstacles to overcome, namely actual and perceptions of land tenure and the related control and ownership of natural resources. Consistent with the sustainable development principles embodied in the biosphere reserve concept, it is necessary to recognise not only the properties of environmental sustainability such as status and functioning of ecosystems and genetic resources, but also the importance of present and future social and economic sustainability such as the ownership and accessibility of natural resources, and the equity of control invested in various gender and cultural groups.

CHAPTER 3

A REVIEW OF PRA AND RRA METHODOLOGIES

3.1 Introduction

Management of natural resources in protected areas has been based largely on ecological data with the view that a sound ecological basis is necessary for sustainable management of these resources. It is also important, however, to understand the social dynamics surrounding resource utilisation regarding the resource users, the resource managers, the relationships existing between these two groups, the economic and social values of the resource, as well as attitudes toward its conservation. There needs to be a fusion of the scientific approach which is purely quantitative (resource ecology), the social science approach (socio-economic/demographic) which is also most often quantitative, and the anthropological approach which is predominantly qualitative or descriptive. This fusion is both necessary and feasible in the multidisciplinary approach of ethnoecology, or more specifically ethnobotany. Ethnoecology is concerned with man's sustained use of the natural environment (Milton and Bond, 1986) examining both the social and ecological aspects of resource utilisation.

There are a wide variety of techniques available in the social, anthropological and ecological sciences to elicit information necessary for natural resource management. However, conventional resource management in protected areas has employed those techniques belonging to the latter discipline, which is essentially quantitative. It is only in the last few decades that more socio-economic techniques, which may elicit both quantitative and qualitative data, have been sought for conservation purposes. The correlation of data arising from these often diverse approaches, is not only seen as problematic, but also contentious, especially with regard to "soft" data arising from qualitative research. The distinctions between, and the need for both, quantitative and qualitatvie approaches are discussed in

this chapter. Furthermore, Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal (RRA) are described, and their potential to bridge the gap between various disciplines in order to aid natural resource management, is examined.

3.2 Quantitative and Qualitative research

3.2.1 Quantitative versus qualitative

There is often great debate among social scientists over the merits and demerits of using qualitative and quantitative research methods but Bulmer (1993) argues that different research methods are not alternatives to be chosen over one another on an *a priori* basis, but that different methods are appropriate to particular problems. Methods should therefore not be seen as in competition with each other, but rather as complementary. Criteria suggested for choosing and evaluating the most appropriate method include appropriateness to the research objectives, reliability (ability to be reproduced), validity (ability to obtain measurements of what is required to be measured), representativeness or generalisability, explanatory power, and administrative convenience (including cost and speed), (Bulmer, 1993).

3.2.2 Data collection phase

Although the following distinctions between quantitative and qualitative approaches were made in reference to social methods (Ward, 1993), the general characteristics of especially the latter, can be applied to ecological work as well. Qualitative studies usually have a relatively small survey size (30-200), employ a non-random or purposive sampling method, have a coverage that is typical of specific groups, and make use of unstructured and flexible data collection techniques. In comparison, quantitative studies generally have a large survey size (100+), sample randomly, are representative of a population and employ structured and rigid data collection techniques. Other marked differences include enumeration and method of enquiry. Qualitative studies emphasise the perceptive and initiative abilities of the

interviewer as crucial while quantitative techniques place importance on discipline. The enquiry method is in-depth for the former while uniform and formal for the latter approach.

3.2.3 Data analysis and report content

The two approaches are also perceived to differ in the analysis process. Analysis for qualitative methods is generally innovative, exploratory and individual, and makes use of many varied research techniques, while quantitative methods are seen to be more established, deductive and standardised. Report content of qualitative studies is based on "soft" impressionistic data which provides understanding and insight of prescriptive value into a specific situation, while reports arising from quantitative research are believed to contain "hard", more precise data, providing facts of descriptive value.

3.2.4 General characteristics

Qualitative research can generally be classed as normative or implicative. Different investigatory tools are utilised to build up an integrated research collage, and it is usually more sensitive and often involves carefully selected case studies, some of which involve surveys of a long duration. In comparison, quantitative research is thought to be more positive, wide-ranging, relatively unselective in terms of narrow objectives, and expensive (time and resource consuming), (Ward, 1993).

One of the advantages of the qualitative approach perceived by Ward (1993), is that it enables the investigation of problems outside traditional boundaries of enquiry. This is important where direct measurement of characteristics and understanding of behaviours and attitudes is difficult, as is often the case in natural resource management, as it searches out the meaning, causes and relationships of phenomena i.e. the similarities and differences. Other advantages include a reduction in non-sampling and total sampling errors, and it is generally relatively quick and inexpensive. One of the advantages cited by Ward (1993) for employing the quantitative approach is that it allows for precise quantification with

estimates within defined limits which is representative, thus enabling an estimation of population characteristics, and easy comparisons.

The aim of this chapter is not to provide a rationale for the use of a qualitative methodology. Rather, it is argued that qualitative research is as necessary a component as quantitative research in fully understanding natural resource utilisation and implications for management. It is therefore necessary to locate a methodology that will enable the successful integration of both approaches. Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) are methodologies that have the potential to allow this amalgamation.

3.3 Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal (RRA)

3.3.1 General background

Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) are methodologies that are predominantly qualitative, but also allow for quantification to some degree. These methodologies have emerged from traditional sociological and anthropological techniques in an attempt to overcome inherent outsider biases and to promote a more explicit ethical framework for research and development. They are also methodologies that seek to encourage rapport building, and recognise the value of indigenous knowledge.

RRA was developed in the 1970's in response to dissatisfaction with biases inherent in development work based on hasty visits to rural areas by mainly urban-based professionals, disillusion with the quantitative questionnaire methodology, and an increasing interest in methods of tapping indigenous knowledge (Chambers, 1992). The principles that are embodied in RRA are as follows:

- learning directly from people in the field and face to face;

- learning rapidly and progressively, not following a rigid blueprint, but adapting and improvising
- learning rapidly and progressively, not following a rigid blueprint, but adapting and improvising;
- offsetting biases by being receptive and responsive, not by imposing and dictating, and actively seeking out excluded groups such as poorer people and women;
- optimising trade-offs between the quantity, relevance, accuracy and timeliness of information, including being aware of what is not worth knowing ("optimal ignorance") and not measuring more than is necessary ("appropriate imprecision");
- using a range of methods, investigators, types of information and/or disciplines to cross-check results in a process known as "triangulation"; and
- seeking diversity of information rather than averages i.e. deliberately looking for, noticing and investigating contradiction, anomaly and differences.

Despite being relatively participative compared to other sociological methods, it is important to note that RRA is mainly extractive as outsiders remain the main actors in gathering, processing and using the data. RRA evolved into PRA during the 1980's, mainly due to activist NGO's seeking to integrate the whole of a local community (women and men, the poorest and the not-so-poor) in a process developed from within rather than imposed from outside (Chambers, 1990; 1992). Edwards (1995) describes PRA as an attitude of mind governing how researchers and/or developers interact with others throughout the process of development. A whole range of techniques is employed to ensure development of analytical skills and mutual sharing of ideas and aspirations so that all community members are actively involved with outsiders in guiding the development processes.

The emphasis of PRA is on participation and empowerment of participants, and much debate revolves around the feasibility of achieving these two underlying principles. In addition to those listed for RRA, PRA stresses the following principles:

- encouraging investigation, analysis and presentation by rural people themselves, so that they can have a stake in the results, the outsider adopting a low profile facilitative role;
- accepting and adopting the pace of the community;
- self-critical awareness and responsibility, in which facilitators are continuously examining their behaviour and embracing error as an opportunity to do better;
- sharing of information and ideas among rural people, between rural people and the facilitators, and between different facilitators.

Some of the strengths of PRA include making participants more aware of their problems, enabling the identification of core problems by correlation, cross-checking information, quick identification of problems, quick relation-building with communities, and improved planning and community profiling. PRA also allows for greater involvement and participation by the villagers, and local resources can often be used in the techniques (Edwards, 1995). PRA tends to view a whole spectrum of issues in order to discover underlying inter-relationships. As such it often raises expectations that the project will solve a wide variety of development problems. Thus, disadvantages of PRA that have been listed include raising expectations of local people to unacceptable levels, stimulating a receiving mentality, suspicion of frequent visits by researchers and developers, and creating deprivation and frustration (Edwards, 1995). In an attempt to overcome these disadvantages, transparency is crucial. The outsider or researcher should be absolutely clear as to what can and cannot be done for the community. Examining exactly what is meant by participation and the implications for researchers in managing their work is also an essential prerequisite. In striving for PRA to be more than RRA, it is essential for participation to be an integral part of the whole development process, not just at the initial diagnostic stages.

3.3.2 Conducting PRA/RRA

Many of the techniques used in PRA and RRA are not new or exclusive to these methodologies. Many have inherent biases, and their applicability can often only be assessed in the context of a particular research project or issue. Good participatory and qualitative

research depends on appropriate principles, attitudes, behaviour, and ethics of the researcher. Chambers (1992) states that none of the methods used in PRA and RRA will work effectively if the approach is wrong. The approach he stresses, depends on the attitude and the behaviour of the researcher and his/her ability to facilitate the participation of the local people. Researchers must have respect for local people and their local beliefs and customs. The value of their knowledge and their time should also be recognised.

Technique selection may prove difficult and depend largely on the researcher's previous experience. However, the choice of technique should not be allowed to direct the research process. Instead, the research objective and type of information required must guide the selection of methods (Mosse, 1994). A bias that may arise during RRA or PRA is the aesthetic bias which Mosse (1994) describes as the under-emphasis of unremarkable methods such as informal interviewing which do not produce such visible outputs as maps and charts. In contrast, many researchers overemphasise visual outputs. It has been noted that more than half of the information gained from a visual exercise is derived from the discussion around the exercise (Attwood and Tooley, 1995).

Also, any RRA or PRA exercise should use a variety of techniques or tools to generate and cross-check information. This process is known as triangulation (Frankenberger, 1992). This is also useful in off-setting biases of certain methods with the use of others (Chambers, 1983). An example of this would be the use of private interviews in conjunction with gathering collective opinions through group activities, to off-set any biases inherent in either of these methods.

Estimating, quantifying and comparing are central to quite a few of the more visual techniques such as time trends, seasonal calendars and matrix ranking. For these exercises either ranking or scoring can be used. The researcher should be careful to use the results as an indication of a trend, and not as an absolute result. Mathematical manipulation of the results, such as adding scores across columns, can distort the information and should therefore be used with caution (Attwood and Tooley, 1995)

3.3.3 Description of techniques

Techniques cannot be placed into fixed categories such as qualitative or quantitative, verbal or visual, extractive or participative, and individual participation or large group participation. Instead they appear to exist along a continuum, and their exact position depends on the research problem, the project design, the experience and personality of the researcher, the degree of participation of the participants, and other inherent characteristics of a particular study area. Techniques commonly used during the RRA and PRA process are described below under broad categories.

3.3.3.1 Secondary data reviews

Performing a secondary data review is not exclusive to PRA or RRA methodologies but one that is essential to all good research. Much time may be saved if all available secondary data are surveyed, allowing the researcher or research team to familiarise itself with the socio-cultural, economic and ecological aspects of the study area (Frankenberger, 1992), and to avoid the collection of information that already exists. Information that may be elicited from previously conducted studies may include the social dynamics of the area, the history of the area and its people, infrastructure, state institutions and facilities, community leadership, regional authority, and environmental conditions. Frankenberger (1992) also suggests that maps and aerial photographs of the area may be of use in certain applications.

3.3.3.2 Direct observation or involvement

Direct observation of field objects, events, processes, relationships or people can be included in this category (Frankenberger, 1992). These types of techniques may occur throughout the study and as rapport with people improves, more subtle and complex social relations may become evident, such as awareness of tensions within a community. Longhurst (1981) suggests that appraisal teams can gather useful information to at least

warn them of the complexities of the situation by spending a few days in the area, mixing prearranged interviews with visits to local markets and impromptu sessions with residents. Every opportunity should be used when in the field to learn about the community, whether it is quietly observing or informal conversations with people whenever the opportunity presents itself (Bulwer, 1993). A widely used anthropological approach is the active participation of the researchers in activities in order to gain first hand experience of the daily lives and tasks of participants, as well assisting in rapport building.

3.3.3.3 Interviews

This broad category encompasses a range of verbal techniques that can be conducted with individuals, small groups, or larger groups either on a random basis or with key informants such as school teachers, community leaders, traditional healers, shop keepers and other resource persons in the area. These key informants may allow teams to tap into networks of knowledgeable persons and materials, and provide an opportunity for the team to learn local knowledge categories (terms, beliefs, practices) so that questions asked in the research process will be understandable and appropriate to the local people (Frankenberger, 1992).

Sensitive issues may be broached more easily in a private interview compared to group discussions. Similarly, stories, portraits and case studies are often employed to enquire about people's life histories or a current situation in-depth, often on an individual basis. Group interviews and discussions are another set of tools that have long been in use. Using this technique, different groups in the community are gathered for open-ended discussion on key topics (Frankenberger, 1992). This technique has the advantages that a larger body of information is accessed and verified by all those present, or at least those who actively participate. Group interviewing has some disadvantages as often only group consensus and collective opinions are elicited and dominant voices are heard. A group interview may not be accessible to all in the community and it may cause conflict within the group. Some researchers use these techniques throughout a study, beginning with a workshop to introduce themselves to a community or certain group of people, and explain the nature and purpose of their presence, followed by a brainstorming exercise to elicit the history of the

study area and people, and to ascertain their particular problems (Ramphele, 1990; Van Vlaenderen & Nkwinti, 1993). These tools are also useful in disseminating information during or at the close of the study to provide feedback to the community (Ramphele, 1990).

Interviews tend to be more extractive in nature rather than participative and are usually semi-structured, making use of checklists of topics to cover, based on secondary data reviews, interviews with key informants, and the researcher's previous experiences (Frankenberger, 1992). Short simple questionnaires may be employed concurrently with other methods such as semi-structured interviews or case studies. In order to assess natural resource utilisation it may be necessary to collect particular socio-economic details and relate them to other information gathered from the respondent. The key here is to keep questions short and simple and only to collect as much quantity with as much accuracy as needed (Frankenberger, 1992). Chambers (1990) suggests that this technique is only used later on in the study once researchers have acquired a certain amount of insight into the research problem, and are therefore far better equipped to realise what further information is required, instead of going ahead and collecting data they may not need. Two principles should be adhered to for these questionnaires. They are optimal ignorance i.e. not trying to find out more than is needed, and proportionate accuracy i.e. not measuring more accurately than necessary, (Frankenberger, 1992).

3.3.3.4 Transects and group walks

Transects and group walks are techniques that depend very much on the type of community being researched and on the research objective. It is commonly used in studies to assess agricultural communities and systems, providing a spatial representation of environmental differences, such as soils, crops, livestock, wildlife, land tenure, and institutional issues (Frankenberger, 1992). It also has been used fairly often in South Africa to look at issues of conservation, erosion, and farming practices (MIDNET, 1994). Commonly, a guide or group of guides will take researchers on a walk through the area , the path defined by either the local participants, the outsiders, or both. In addition to gaining a general understanding of the area and the community, this technique is also useful in discovering issues that

otherwise would not have been raised by the community, and of which the outsiders would not have been aware.

3.3.3.5 Diagramming and modelling

Diagramming is also a broad category, and the emphasis is on the visual presentation of information and discussion around it. Mapping and modelling are techniques that fall within this category where participants may be asked to produce maps or models. Different types of mapping and modelling include:

- resource maps/models of catchments, village forests, communities, land use or soil distribution, location of wells, trees, ecological pressure points, and individual field plots;
- social maps/models of residential areas indicating household composition, literacy, asset ownership, employment and human welfare;
- maps/models comparing the present with the past or anticipated future; and
- maps by or for different interest groups.

Maps are produced on different surfaces, for example, paper, the ground and the floor, with different media, such as chalk, pens, coloured powder, cutting and sticking paper. Models make use of various materials such as sand or clay, cardboard and vegetation. Both these tools can provide the researcher with an overview of the resources available within the study area (Frankenberger, 1992).

Seasonal calendars or charts may also fall under the heading of diagramming. Participants are asked to construct a calendar of events that typically occurs in their daily lives over an annual cycle, usually relating to specific issues of human activity and natural, social or economic factors. The calendars can be drawn on the ground using materials such as stones, sticks, different coloured leaves or chalk, or on paper also using a variety of media. Piles of counters are made in separate boxes, each box representing a separate month or season of the year, according to local terminology. The size of the pile reflects, for example, the amount of rainfall or work done for a certain period. Some of the issues that have been investigated using this method, either by joint or separate calendars, include climate,

particularly rainfall; agriculture (fodder availability, crop sequences, pests and diseases, perennial and wild harvest); agricultural and non-agricultural labour divided by gender; labour demand for men, women and children; income; expenditure; the need for and availability of credit; prices; migrancy; food availability and consumption; the incidence and prevalence of sickness and hunger; social events and general well-being (Frankenberger, 1992; Welbourn, 1992; Bulwer, 1993; Mosse, 1994). Inter- annual variations may also be represented using separate calendars (Mosse, 1994).

Venn diagrams may be used to investigate local perceptions of institutional control and decision-making. Key institutions and individuals responsible for decision-making are represented by circles with differing degrees of overlap (Frankenberger, 1992). In addition to the circle overlap or linking lines, the size of the circles are critical as they can be used to show for example importance or prevalence of particular institutions or ideas.

Time lines depicting chronologies of events can be very useful in understanding what led to present circumstances and perceptions of events in the histories of communities. There may be a focus to these discussions such as village infrastructure and services, health and disease, ecological or crop histories, or other livelihood changes (Mosse, 1994) or it may be general and serve as an introductory and rapport-building exercise. Similarly, time trends or trend analyses show changes over time, often decades, for various issues such as migrancy, soil erosion, crop yields, population size, water tables and food prices. This exercise is usually done in the form of a matrix. Older people often contribute substantially to this exercise and time lines.

3.3.3.6 Ranking

Pairwise ranking involves determining preferences whereby pairwise comparisons are used to investigate decision-making criteria between various items, e.g. fodder or tree species, crop varieties, horticulture, fuel types and medical services (Frankenberger, 1992; Mosse, 1994). Each item, issue or problem is compared with another, one by one, until an overall sequence of importance was established.

3.4 Use of PRA/RRA in conservation: selected case studies

3.4.1 Developments internationally

3.4.1.1 General background

PRA and RRA are relatively new to South Africa, and their acceptance as successful research and development tools is increasing. Very little RRA or PRA has been used to simultaneously promote conservation and local rural development in South Africa, although internationally, these methodologies have worked very well (Wild, 1994; Mason and Danso, 1995; Pocknell and Annaly, 1995).

Despite a general lack of literature on the use of RRA and PRA in conservation and natural resource utilisation, three case studies have been selected to demonstrate the types of techniques used, and the strengths and weaknesses of these methods in addressing conservation and resource use.

3.4.1. 2 Bwindi Impenetrable National Park, Uganda

Wild (1994) describes a pilot project allowing sustainable resource use from Bwindi Impenetrable National Park, which like several other national forest parks in Uganda, is surrounded by human populations with exceptionally high densities. People are typically resource-poor agriculturists, subsisting on small plots, and having been used to almost unlimited access to forest products. However, access was limited due to the proclamation of these areas as national parks. This has caused further impoverishment, and created a feeling of bitterness and hostility. The Uganda National Parks (UNP) department asked two organisations that were currently involved with community soil and energy conservation projects, agroforestry and sustainable agriculture to assist in identifying 20% of the park as a multiple use area in which surrounding communities would have access to non-timber forest products on a sustainable basis.

The process chosen was of a participatory nature which involved local community members from the beginning. Initially community use of resources was discussed, followed by an information gathering exercise, involving ethnobotanical studies as well as local community participation in the compilation of an initial assessment of the range of possible species for utilisation. Modification of both PRA and Joint Forest Management (JFM) were used. Techniques used included key event charts, stick graphs of resource and population trends, and key informant interviews to provide background to the resource use in the area. Preference and pairwise rankings of categories of forest products, preferred species, and species characteristics such as growth rates, have provided species information. Physical mapping of village and adjacent forest has identified locations of resources required and potential boundaries of the multiple-use areas. Venn diagrams, group work and visualisation cards have been used to identify community structures and organisations. This has led to the development of structures for community and UNP management of utilisation of resources. Ground attitude graphs, participatory forest plots and transects have acted as baselines and initiated the monitoring process. The promise of access to resources has helped to improve the attitudes of local people toward the park, PRA and JFM were seen as appropriate techniques by the community. There is now a working relationship between the park officials and the local people.

3.4.1.3 Mole National Park, Ghana

Mason and Danso (1995) used PRA to assess local people's perceptions of the benefits experienced and difficulties faced, as a result of residing next to Mole National Park in Ghana. The project was designed to initiate a planning process which would involve local people in the on-going management of the park. The authors make the point that it is sometimes difficult to convince scientifically orientated individuals of the validity of the PRA approach. However, they found the approach useful, and suggested that it was often the only approach acceptable to villagers, biased by years of mistrust and conflict with the Ghanaian National Parks Department. PRA was seen as appropriate to restoring a level of trust between the two parties. A minimum of three visits were undertaken to each village: a preliminary introductory visit, a major assessment visit, and a follow-up feedback visit

averaging 3 days in each village. Separate meetings with men and women were held to discuss issues identified by villagers that were crucial to their co-operation with the Ghanaian Department of Game and Wildlife (GWD). Techniques that were used included local histories, resource and social mapping exercises, time lines on agriculture and water and food availability, non-formal livelihoods, and transect walks in which village land and water resources were mapped and studied. Semi-structured questionnaires were abandoned as the villagers' previous experiences with questionnaires were in connection with forced evacuation. Barriers of hostility and distrust were overcome with patience and transparency encouraged by the PRA approach. In situations where there were language barriers there was a tendency for dominance by a few individuals or complete deference to the village chief. Interpreters resident in each of the villages were used, and the research team received a great deal more co-operation and information than was expected.

On assessing this project, it was found that PRA was a useful approach for building trust in latent antagonistic situations. The research team found that people were far more willing to trust outsiders when conservation traditions of the local people were acknowledged. The authors also stressed that it was very important not to make promises or raise hopes during the research process. PRA was also thought to have provided opportunities for the elderly in each village to pass on local histories and traditions to young people. It can therefore be said that the research team's visits genuinely contributed to the natural process of information transmission within the village societies, a process which is increasingly threatened by the breakdown of traditional societies such as these. The process is also thought to have been useful as it reminded the villagers of the usefulness of some resources, that they had until then, taken for granted. The success of this study is attributed to the flexibility of PRA which appreciates the uniqueness of a community, and allows for adaptation of techniques.

Despite the obvious benefits of having a very structured approach in gaining increased legitimacy within scientific realms, too much structure may bring PRA more toward science than science toward PRA. In situations where mistrust abounds, documentation, including note taking, must be approached rather carefully and always with the permission of the

people. Mason and Danso (1995) also commented that the current trend toward involving local people in protected area management can only work when people's confidence is strengthened and they are empowered. They found PRA to be a better approach to building such confidence and empowerment than any other previously applied technique. If community participation is crucial to ensuring the sustainability of protected areas, then PRA must be viewed as an important component of any conservation approach. PRA in this project built confidence and self-appreciation, and the villagers as a result, requested input into the management of the area.

3.4.1.4 Forest reserve land use, Sierra Leone

The third case study described is the employment of RRA in Sierra Leone to obtain information on the local land use patterns and ecology of a forest reserve from villagers living adjacent to this conservation area. Techniques that were used include mapping, transects, a participatory plant collection exercise, oral histories, short questionnaires, semi-structured interviews and group discussions. It is acknowledged by the authors that the RRA approach enabled the research team to gain a quick yet thorough understanding of the local ecology, resource use, and attitudes towards and processes operating within the forest reserve, an understanding that a conventional approach would not have achieved. However, the authors regard that the most important contribution that the RRA approach made to this project, was that it allowed the needs, attitudes and inspirations of local villagers to be given a voice in the context of future conservation objectives (Pocknell and Annaly, 1995).

3.4.2 PRA/RRA in southern Africa

3.4.2.1 General background

As already mentioned, RRA and PRA in South Africa are fairly new methodologies, and their success is difficult to assess. Where they have been practised, their application has often not been published, or they have been employed largely in needs assessment projects,

with little emphasis on natural resource utilisation. PRA seems to be the methodology predominantly used in South Africa, with very little mention of RRA.

A wide range of PRA techniques have been used for research, planning or development projects, such as socio-economic appraisals of communities for later project development and evaluation, understanding peri-urban farming practices and related constraints, the promotion of a catchment management programme, social forestry programmes, and land reform processes regarding land acquisition (MIDNET, 1994). PRA is also being used for community-based natural resource management in communal areas in northern Namibia. In Botswana, extended PRA exercises are currently being proposed to assist rural communities in the Kalahari to manage their natural resources on a sustainable basis. (MIDNET, 1994).

Techniques employed in these various surveys and planning processes have included wealth ranking, seasonality information pertaining to rainfall, agricultural work and expenditure, health profiles, mapping resources, animals and neighbouring farms, time trends on land issues, the ranking of land uses, seasonality diagrams, matrices to determine resident types and rights, ownership options, eligibility for rights and finance options (MIDNET, 1994).

3.4.2.2 Social studies centred on conservation and natural resource use

There appear to be very few studies that have been conducted on the social dynamics surrounding resource use, as most projects of this nature focus almost exclusively on the quantitative assessment of supply and demand. Some of the methods that have been employed in studies on natural resource utilisation are highlighted. A situation analysis of the woodcarving industry in the eastern Transvaal used a key informant approach (Shackleton, 1993). Woodcarvers (20) and furniture makers (21) were interviewed using a semi-structured interview schedule. PRA tools such as card sorting, matrix ranking and group discussions, were employed where appropriate. No further detail is given, and although the techniques employed were attributed to PRA, it is more likely that they were part of an RRA approach, as the study tended to be more extractive than participative with the researcher formulating the study and eliciting information. Participants were located by

asking each interviewee to direct the researchers to the next woodworker in the area (Shackleton, 1993).

An assessment of the plant resource needs of local traditional healers in Weenen Game Reserve involved herbalists who divided themselves among three different areas, each representing a different vegetation type within the reserve to survey valuable plants. Specimens were collected of each species found, and the Zulu name, plant parts used and uses of each species were noted (McKean, 1994). This technique can be related to transect walks used in RRA and is significant because it acknowledged the value of traditional knowledge and allowed for active participation of the herbalists.

Questionnaires and interview schedules have probably been the most commonly used technique in assessing social aspects surrounding the use of natural resources such as edible plants (Dzerefos *et al.*, 1995), indigenous trees for firewood and construction materials (Griffin *et al.*, 1992; Cleminson, 1993), as well as attitudes towards conservation areas (Infield, 1988; Pitout, 1994).

Infield (1988) with the use of an interview schedule, and Pitout (1994) with a questionnaire assessed local communities' perceptions towards local protected areas in KwaZulu-Natal, namely the Umfolozi-Hluhluwe-Corridor Complex Game Reserve, and the Thukela Biosphere Reserve, respectively. The respective reasons given in these two studies for the employment of fixed response questions as part of their methods, were time constraints and that they allowed for easier interpretation and analysis than open-ended questions. Perhaps the selection criteria for the methodology should have been made in response to the studies' objectives, rather than in response to time constraints and ease of analysis. It is thought that RRA may have been a better approach in both scenarios. This is because RRA allows for relatively rapid appraisal, attempts to overcome outsider biases, and encourages the use of local terminology and local identification of relevant issues. RRA also allows for the gathering of more quantitative data such as demographic information through the employment of short questionnaires. These questionnaires, however, are always conducted in conjunction with other techniques to make sure the findings are valid. In studies where

only fixed response questions are used, it can be argued that the responses provided by participants are mere agreements or disagreements of what the researcher views as relevant issues, and may not reveal other issues that are viewed as important by the participants themselves.

It may be counter-argued that RRA does not stress the quantification of data sufficiently, for example, the ability to "accurately" state what proportion of the participants of the study agreed or disagreed with a particular statement regarding conservation. Another counter-argument that may be offered is that RRA is very flexible, and depends heavily on the personality of the researcher. These characteristics may make it difficult to repeat the study and thus decreases the reliability of the findings, and ability to make comparisons with other studies. In response to these potential arguments, three questions need to be posed. Is the precise quantification of findings relevant and necessary in assessing people's perceptions of and attitudes towards conservation issues?, should certain methods be disregarded in order to ensure that the study is easily replicated?, and is it necessary to compare the findings of the study with that of other studies? If the answers to these questions are negative for a particular study, it is suggested that a more flexible approach, such as RRA or PRA, is adopted in order to address local communities' attitudes towards and perceptions of conservation issues, and not the conventional approach which singularly involves the questionnaire method. If questionnaires are deemed necessary, then they should be employed within a RRA or PRA framework, and in conjunction with other techniques.

3.5 Conclusion

Due to the complex nature of natural resource utilisation, it is no longer adequate to employ methods based solely on ecological principles. Social and anthropological techniques are now also being sought to address these conservation issues. Not only is quantitative data seen as invaluable, but also data of a more qualitative nature, in order to understand the social dynamics surrounding natural resource use. RRA, and especially PRA, are seen as methodologies able to address this requirement. It is important to realise that PRA and RRA are more than a set of techniques, but rather centred around principles which include

counteracting outsider biases, optimal ignorance, appropriate imprecision, participation, empowerment of participants, and the recognition of traditional knowledge.

PRA and RRA have been used successfully in conservation issues internationally, while in South Africa their use is relatively new and their success difficult to assess. Other social studies conducted locally regarding conservation and natural resource utilisation have largely been limited to formal questionnaires or with a focus on quantitative data. PRA and RRA are thought to be potential tools to integrate the various approaches and disciplines, although more thought is needed to achieve the successful integration of qualitative data regarding social dynamics and the ecological data which is essentially quantitative.

CHAPTER 4

THE STUDY AREA

4.1 Introduction

The description of the study area provided within this chapter is centred around information that is likely to have an effect on the access, control and utilisation of natural resources. Relevant biophysical characteristics include those that are likely to affect the productivity, regenerative and carrying capacities of the land i.e. the supply and availability of natural resources. In contrast, the social characteristics of the area that are presented are those likely to affect the utilisation and control of natural resources i.e. those affecting demand. All these characteristics are strongly connected to the issue of land in terms of access, control, and ownership. Although discussed separately, it must be recognised that these characteristics are interactive and dynamic.

The study area falls mainly within the Weenen District, although partly in the Msinga District, and includes both the Thukela Biosphere Reserve (TBR) and the some of the neighbouring communities. Some of the conspicuous differences in terms of natural resources between these two areas are visible in Plates 4.1 and 4.2 on the following page.

On a more regional scale, the study area falls within the Tugela Basin catchment. There have been many detailed regional studies of the Tugela Basin focusing on regional development (Thorrington-Smith, 1960); the geology and hydrology (Matthews, 1969); agriculture and related development (Phillips, 1972); soils (Van der Eyk, 1967); and vegetation (Edwards, 1967). In terms of the social characteristics, most of the studies are recent and have focused on social injustices in the Weenen District such as labour tenant removals (Clacey, 1989; Todes and Krone, 1990), and cattle impoundments (Kockott, 1993).

Plate 4.1 One of the entrances to the Thukela Biosphere Reserve. Note the extensive grass cover, and the presence of trees.

Plate 4.2. Mhlangana, an area in the Msinga District. The barren foreground, mostly devoid of grass and trees, with extensive gully erosion is a stark contrast to the above photograph. The mountain in the background is part of the TBR.

4.2 Biophysical characteristics

4.2.1 Locality

The study area comprises the entire Thukela Biosphere Reserve (TBR) which falls within the Weenen District, and part of the neighbouring communities within the districts of Weenen and Msinga. These two districts are highlighted on the map shown below (Figure 4.1).

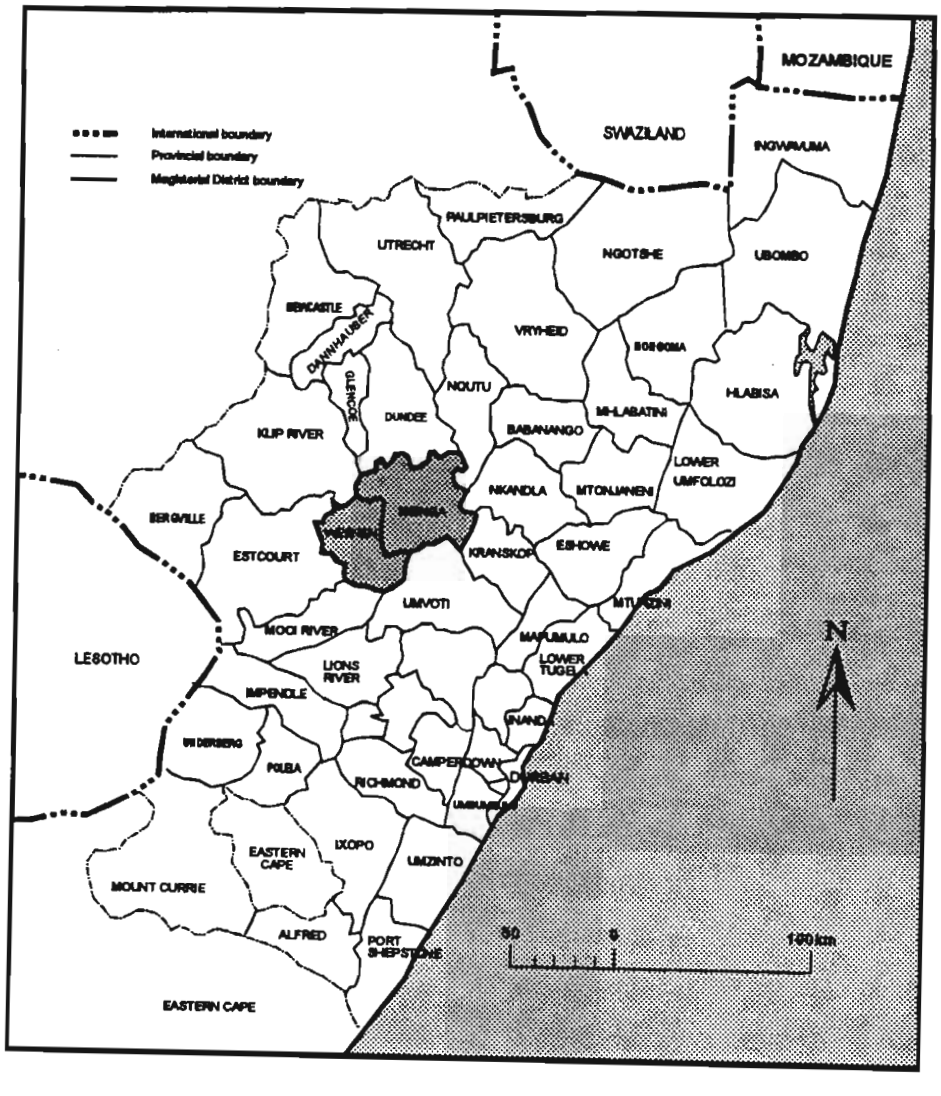


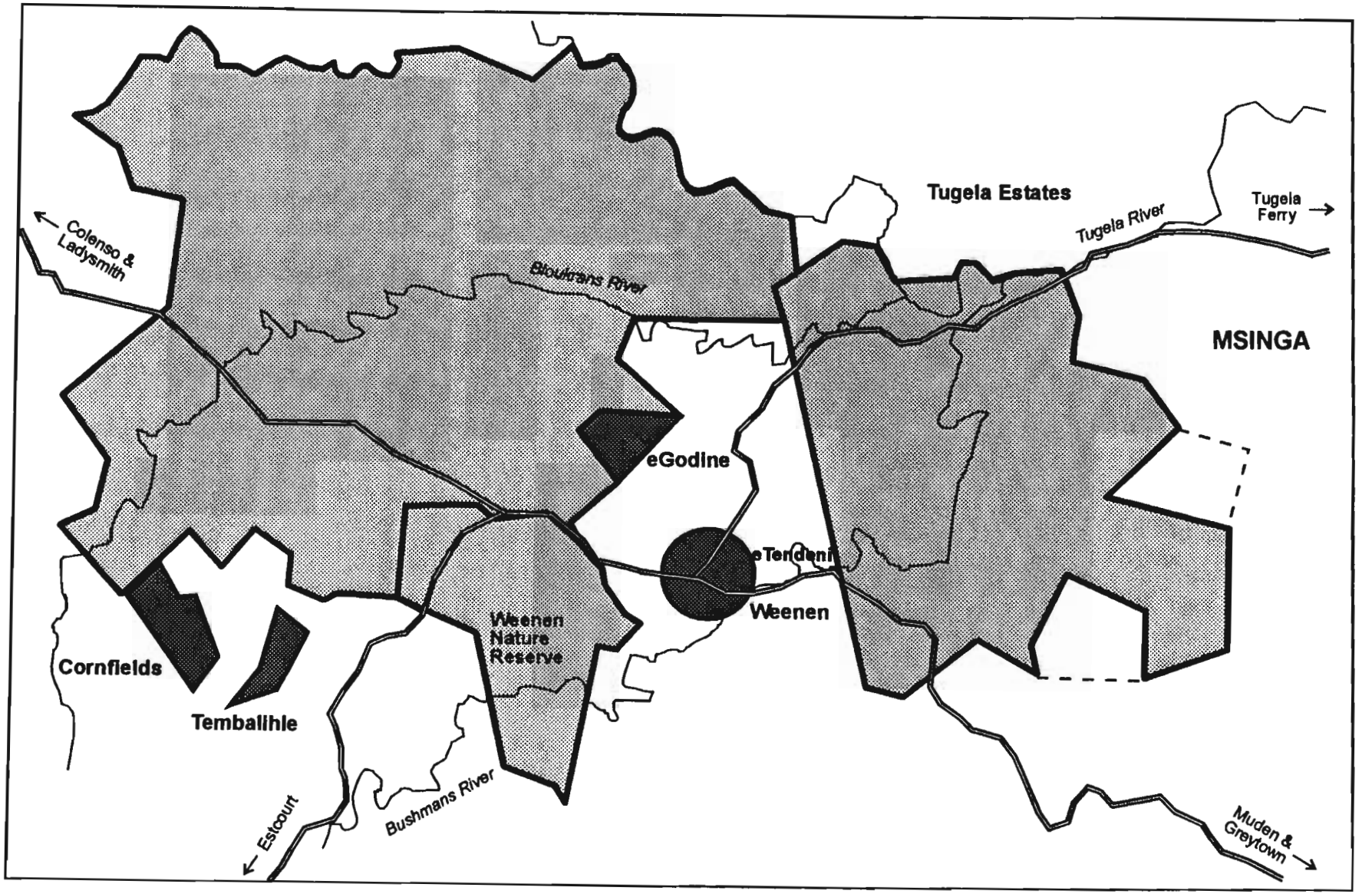
Figure 4.1 A map showing the magisterial districts of KwaZulu-Natal. The Weenen and Msinga Districts, in which the study area is located, are shaded.

The neighbouring communities include Cornfields, Tembalihle, eGodine, eTendeni and associated "tent towns", Msinga and Tugela Estates. The entire area is situated between Ladysmith in the north-west, Colenso in the west, Estcourt in the south-west, Muden and Greytown in the south-east, and Tugela Ferry and Pomeroy in the north-east. The boundaries of the TBR as existing in 1995, the location of some of the major towns, and neighbouring communities are shown in Figure 4.2 on the following page.

4.2.2 Geology, topography and soils

The geological structure of the Tugela Basin, as described by Edwards (1967), consists essentially of younger, predominantly sedimentary members of the Cape and Karroo systems resting upon a number of ancient, folded, intrusive and intensively metamorphosed formations of the Archaean Basement Complex. Based on the present-day surface distribution of the geological formations, and the principal contours and river systems of the basin, the Tugela Basin is divided into seven ecological regions. The study area falls within the Valley region which has been described as "wild and rugged", and more specifically within the Interior Valley Sub-region (Edwards, 1967). Within this sub-region, numerous dolerite intrusions, capping stony ridges, koppies, and steep valley flanks contribute to a rough topography and to a markedly stepped gradient of the Tugela River (Edwards, 1967). The study area generally falls predominantly within the Ecca Series, characterised by shale, sandstone, grit and coal, although the Beaufort Series is well represented to the west and south, characterised by shale, mudstone, sandstone and limestone. Both the Ecca and Beaufort Series are part of the Karroo System. The study area falls predominantly between 900 and 1400 metres above sea level, while there are areas that fall between 300 and 900 metres (Edwards, 1967).

A generalised soil map of the region places the study area within two categories. Claypan soils and vertisoils are found more to the west of the town of Weenen while soils typical of semi-arid regions are found more to the east. Soils within the area are highly erodible and sheet and gully erosion are widespread (Van der Eyk, 1967). In this region, strips of young



Source: MAJ McDowell, Cartographic Unit, Dept Geographical and Environmental Sciences, University of Natal, Durban (revised 1995)

Figure 4.2. The Thukela Biosphere Reserve (lightly shaded area) and neighbouring communities, 1995.

fluviatile alluvium are also found along the major rivers and some of the smaller streams. Apart from these soils, a large proportion of the Valley Region consists of "stony land", mainly made up of hills and steep valley sides. It is occupied by rock outcrops, rock debris and lithosols: very shallow, usually stony soils (Van der Eyk, 1967).

The soils of the doleritic outcrops are relatively more fertile than the soils of the surrounding plains, apart from the soils adjacent to the drainage lines where alluvial and colluvial deposition has resulted in increased fertility. The fertility of the soil directly affects the quality of the herbage on offer to the grazing animal, with the result that the past grazing pressure on more fertile areas has been higher than less fertile areas (AFRA, 1991). This deterioration in ground cover has led to higher runoff and increased erosion in some areas of Weenen (Todes and Krone, 1990).

4.2.3 Climate

The whole of the Interior Valley Sub-region has a mean annual rainfall of 600 to 700 mm, which is unpredictable, and the area has always been prone to droughts. Rainfall is higher in the areas closer to the Drakensberg (Cross *et al.*, 1995). High temperatures in the Valley Region result in high evaporation, which reduces the effectiveness of rainfall. Because much of the region consists of steep slopes with a poor plant cover, much of the rainfall runs off into streams and rivers without being available for plants. The Valley Region is reported to be the driest in the region (Edwards, 1967).

The area experiences a wide temperature range with very hot summers and cold winters with frost (Todes and Krone, 1990). Maximum temperatures as high as 45 °C have been recorded with mean daily maxima just over 30 °C for two to three of the summer months December, January and February, and over 25 °C from September to April. Although these maximum temperatures are similar throughout the Valley Region, the minimum temperatures vary considerably in different parts of the region due to rugged topography, with corresponding variation in the vegetation (Edwards, 1967). The Interior Valley Sub-region experiences the coolest temperature of the region with mean daily minimum

temperatures of 0 °C and 2.8 °C during June and July respectively, with lowest recorded temperatures of -6.7 °C . Severe frost is experienced from May to August (Edwards, 1967).

4.2.4 Hydrology

The Thukela Biosphere Reserve and neighbouring communities fall within the Tugela River Basin catchment. Although the area has abundant water in the main rivers originating in the Drakensberg, namely the Tugela, Bushmans and Bloukrans Rivers (see Figure 4.2), perennial streams are now few, and most watercourses dry up in winter (Cross *et al.* , 1995). There are relatively few dams in the area and water supply for livestock and humans is dependent on boreholes on farms. Within the town of Weenen, and on the banks of the Tugela and Bushmans Rivers, many large fields are irrigated.

4.2.5 Vegetation

The study area falls within Acocks' (1988) broad classification of Valley Bushveld, which is found in valleys of numerous rivers, valleys which are hot and receive less rain than the interfluves which receive between 500 and 900 mm per annum. It is recognised however, that there can be great variation in vegetation, even over short distances, which are of great importance to farm management (Acocks, 1988). As this project is based on the sound management of natural resources, it is necessary to use vegetation descriptions that provide more detail than provided by Acocks (1988). For this reason, this description of the vegetation is taken from Edwards' (1967) "Plant Ecology Survey of the Tugela Basin". Within Edwards' (1967) broad classification of Valley vegetation which occurs throughout the study area, there are vegetation types that are described in greater detail. These are described as follows:

- Aquatic and hygrophilous vegetation

Hygrophilous vegetation in the Valley Region is mainly riverine as vleis are rare. Vegetation communities along the watercourses vary from *Phragmites australis* reedbeds and hygrophilous grassland, to open hygrophilous trees and shrubs, and riverine and streambank woodland. However, heavy disturbance of the vegetation by humans and animals is common along most of the rivers, and many of these communities have been damaged or destroyed.

- Succulent vegetation

Based on the vegetation maps of Edwards (1967) only one community of Succulent Vegetation was identified to occur in the study area, namely *Euphorbia tirucalli* Succulent Scrub. Although this community is restricted to very small pockets of vegetation, it is worth describing as it is a potential dominant over almost the whole of the Valley Region south of the Tugela River, with the exception of those areas prone to frost. *Euphorbia tirucalli* has been reported to invade several other communities, including Semi-Deciduous Bush, *Combretum apiculatum* Tree Veld, and *Spirostachys* Valley Woodland.

- Dry valley scrub and Savanna

The Dry Valley Scrub and Savanna which occurs in the hotter and drier areas of the Valley Region is a complex vegetation upon a rugged topography. The principal trees are *Acacia tortilis*, *Boscia albitrunca*, *Combretum apiculatum*, *Euclea schimperi*, *Olea africana*, *Schotia brachypetala*, and *Spirostachys africana*. There is a general gradient in the vegetation from taller woodland and Savanna types in the eastern Valley Region, to shorter and more scrubby types in the western inland areas. There is a general zonation of plant communities, with the most xerophytic

occurring on the Valley bottom and on the steep north-facing slopes south of the Tugela.

The complexity of the Dry Valley Scrub and Savanna has been enhanced by severe disturbance within the last one hundred years and as a result, secondary plant communities occur over wide areas. It is noted by Edwards (1967) that should present (1967) biotic pressures and soil erosion continue, only the most xerophytic plant communities will survive.

Based on the vegetation maps of Edwards (1967), one community of Dry Valley Scrub and Savanna was identified. The Semi-Deciduous Bush, (*Acacia-Boscia-Olea-Schotia* Scrub), a climax community, is the principal association of hot, dry areas of most of the Interior Valley Sub-region and is surrounded mainly by the Interior *Acacia karoo-A. nilotica* Thorn Veld. To the east it adjoins *Combretum apiculatum* Tree Veld, *Spirostachys* Valley Woodland and *Euphorbia tirucalli* Succulent Scrub.

Most species of the Semi-Deciduous Bush are deciduous during the dry winter, but evergreen species such as *Boscia albitrunca*, *Olea africana*, *Euclea schimperi* and *E. crispa* are prominent. Succulent plants, mainly *Aloe* and *Euphorbia* species occur on shallow and eroded soils. A grass field layer occurs between the shrubs and trees while a shade-tolerant, herbaceous and sub-shrubby stratum occurs in the scrub. A secondary field layer predominates in areas of grazing, browsing and trampling.

- Marginal and Transitional Valley Vegetation

Based on the vegetation maps of Edwards (1967), one community of Marginal and Transitional Valley Vegetation was identified as occurring within the study area. The Interior *Acacia karoo-A. nilotica* Thorn Veld is the most xerophytic and important member of the true Thorn Veld group of communities. From an ecological and agricultural point of view, this community is of considerable

importance because of its widespread invasion of more open grasslands and woodlands. Relic species, such as *Acacia sieberana*, and relic stands of pure *Themeda-Hyparrhenia* Grassland, are frequent indicators of a past *Acacia karoo-A. nilotica* invasion.

- General

There is at least one endemic tree species to the area, *Vittelaropsis dispar*, commonly known as the Tugela Bush Milkwood (Pooley, 1994). *Pleurostylia capensis*, the Coffee Pear, is considered to be fairly rare (Pers. Comm. R. Scott-Shaw). Two other species, *Cassine transvaalensis*, the Transvaal Saffron, and *Harpephyllum caffrum*, the Wild Plum, were listed as "endangered and declining", and "declining", respectively, in a report by Cunningham (1990) on Zulu medicinal plants.

The bushveld has been heavily overgrazed over the last century. This has led to the replacement of more palatable grass species by tougher less grazed species (Todes and Krone, 1990). Though most of the area is covered by dry Valley vegetation, much secondary disturbance of the vegetation is evident. In many instances the deterioration of vegetation and soils represents nearly the worst scenario and almost completely bare rock has been exposed (Edwards, 1967). This has dire consequences for humans and animals: "In 100 years a centimetre of dust will have grown from the rock. In 10 000 years there could be soil to plough. For a man in a hurry, however, bedrock is the end of time. When he hits bedrock he is face to face with nothing" (Alcock in Kockott, 1993).

4.2.6 Conservation status

The entire Thukela Biosphere Reserve, although it has no legal status, may be considered a conservation area, and there are plans by its members to develop it for ecotourism. Although many of the farms are in poor condition due to bush encroachment, overstocking and poor cultivation practices, many rehabilitation programmes have been initiated to

restore it to its original condition. It is believed that this area was once of high quality pastoral value as it was unlikely that the Voortrekkers would have selected an area that was highly eroded or showed the present scrub density and poor grass cover for one of their principal settlement areas (Edwards, 1967). The Weenen Nature Reserve itself, is rehabilitated land that was appropriated by the Department of Agriculture before being handed over to the NPB in 1975. It is considered to be a good example by present landowners of how land can be restored and has stimulated interest among local farmers to join the TBR.

4.3 Social characteristics

4.3.1 History of land occupancy

Archaeological evidence indicates that African farming peoples have resided in the Tugela Basin since 500 AD or earlier, making use of localised pockets of rich riverside soils and year-round sweetveld grazing (AFRA, 1989). Voortrekkers/ Trekboers entered Natal in the 1830s and at the end of that decade laid claim to land in the Weenen area. The African families residing on this land came to be regarded as tenants who made cash-payments to maintain their residency. Cash tenancy was gradually replaced with that of labour tenancy and by 1932 the contract period had been extended from three to six months. Under this system, each household had to provide labour to the land owner for a period of six months in return for the right to use a portion of the land for agricultural production and subsistence (Clacey, 1989).

In 1969 the government introduced a district ban on labour tenancy, entitling the farmers to only five resident families, all of whom had to be employed on a full-time basis. As a result of this ban, it is believed that several thousand people were removed from the Weenen District, beginning with families being moved to Msinga in the 1970's. Some of the reasons for these removals are thought to include strained labour relations, a policy of working for the farmer as a condition for remaining on the farm coupled with low wages and poor service conditions, pressure from state conservation bodies on farmers to adhere to stock carrying capacities, changes in ownership of farms, and mechanisation (Todes and Krone,

1990). Those evicted were strongly opposed to these removals as they believed they were being evicted from their homes, their place of birth, and that of their forefathers to which they had a **de facto** right. Some of these people were moved to a "temporary settlement camp" outside the town of Weenen in the 1960s. This camp, known as eTendeni, has now become peri-urban and still exists today. Nearby are the "temporary" Green Tent Town and the White Tent Town (Alcock, 1994) which were more recently established, 1988 and 1989 respectively, to accommodate people moved off farms (Todes and Krone, 1990).

Despite the labour tenancy ban and the removals that occurred, labour tenancy still exists on farms within the district, although under a variety of guises (Pitout, 1994). Farmers also employ casual labour who do not reside on farm properties.

4.3.2 Social conflict

There is a long history of conflict over land in the Weenen District and the name Weenen itself, meaning "the place of weeping", refers to the place at which Voortrekkers were killed by Dingane's soldiers. In Zulu, the town is named kwaNobamba, "the place where we caught them", referring to the same incident (Kockott, 1993). Relations between farmers and their workers are particularly strained and various assault charges and violations of human rights have been brought against some farmers in the area (Kockott, 1993; Gibson, 1995). The main source of embitterment has been the evictions of families from farms on which they have resided for many generations (Clacey, 1989; Alcock, 1994; Gibson, 1995). Cattle impoundments have caused, and continue to cause, major conflict between landowners and their neighbours (Kockott, 1993; Gibson, 1995). Many local people are also arrested for trespassing and collecting firewood on private farm property. Stock theft has also adversely affected relations between neighbouring communities and farmers. Fighting between various clans occurs sporadically and a taxi war, which is having a marked affect on transport, is ongoing.

4.3.3 Current landowners, tribal communities, and authorities

The Thukela Biosphere Reserve was founded in 1993 by seven founder members, and membership has risen to over 30 in the past, to include approximately 54 000 ha of land (Bill, 1995). However, at the time of the writing of this thesis, the number dropped to 22 members. This number fluctuates as new members join, and others resign, particularly landowners on the boundaries of the TBR. Apart from the Natal Parks Board, who manages the Weenen Nature Reserve, all the other members are white private landowners. Other white farmers (non-members) border the TBR in the south. The communities of Cornfields and Tembalihle, two "black freehold areas" are located on the western boundaries of the TBR. Both these communities, assisted by AFRA, have recently acquired 8000 ha of privately-owned farm land under Act 126 of the government's programme on land distribution (AFRA, 1994). The former KwaZulu homeland of Msinga borders the TBR on its northern and eastern boundaries. Tugela Estates is located to the north. There are several tribal groups in the area, which include both local people residing on farms as well as former homeland territories. These main groups are the Mchunus, the Mabasos, the Mbheles and the Mtembus (Kockott, 1993). The Mtembu and Mchunu tribes, respectively under the authority of Nkosi Ngoza Mvelase and Nkosi Simakade Mchunu, are the two largest tribes in KwaZulu-Natal (Alcock, 1994).

At present, other major players in the area include the Inkhata Freedom Party (IFP), local government, the Natal Parks Board, provincial and governmental planners, the Town Board and the Farmers' Association (Alcock, 1994). Governmental offices for the Pilot Land Reform Programme have recently been set up in the town of Weenen.

4.3.4 NGOs/CBOs operating within the area

There are many non-governmental organisations (NGOs) that have been or are active in the area. These include The Association For Rural Advancement (AFRA), Community Law Centre (CLC), Farmers Support Group (FSG), Rural Foundation (RF) and The Church

Centre (CLC), Farmers Support Group (FSG), Rural Foundation (RF) and The Church Agricultural Project (CAP). There are also community-based organisations (CBOs) active in the neighbouring communities of the TBR, including Weenen, Muden, Msinga and Colenso, such as the Peace and Development Committee and other development committees within Cornfields and Tembalihle.

4.3.5 Land tenure

Presently the ownership of land may be placed in the following categories: state-owned land (the Weenen Nature Reserve and land surrounding the town of Weenen); privately-owned land (farms owned by white farmers), "black spot" free/leasehold communities (Cornfields and Tembalihle); and tribal trust land (Msinga). The recently published Land Reform (Labour Tenants) Bill, 1995, and the Restitution of the Land Rights Act, will enable the transfer of ownership of some of the presently white-owned land to present and past land tenants and other black people who have a claim to land within the Weenen District. This transfer of ownership, while promoting equity and ensuring of human rights may well present a new dimension to the utilisation and management of natural resources in the area.

4.3.6 Land use

Within the TBR, land use is predominantly commercial cattle farming, commercial cultivation of crops along the banks of the Tugela River and in the town of Weenen, and residency for labour tenants. Many of the members of the TBR who farm cattle are changing over to game ranching. The farm residents are generally not allowed to cultivate crops, and most are permitted to keep a limited number of livestock (cattle and goats). Both cultivation and livestock production by farm residents are for subsistence purposes. Much of the area is of marginal agricultural potential. The potential for crop production is highly variable, with some high potential lands around Weenen town, provided irrigation is made available (Todes and Krone, 1990). According to the Department of Agriculture, stocking capacities vary widely from between 4,5 and 22 hectares per stock unit (Todes and Krone,

1990). People living in Msinga keep livestock and grow crops where possible. Both these activities are for subsistence purposes.

4.3.7 Economic and demographic status

Economic and demographic characteristics are markedly different between the white farmers who own extensive property, compared to the black labour tenants or farm residents living on the farms, and the members of neighbouring communities. The white population of Weenen has been declining since the 1960's and is presently about 300, which is the same number as the Indian population which is believed to have levelled off (Cross *et al.*, 1995). The African population of the Weenen area decreased drastically at the time of evictions in the 1970's but has been increasing in the last five years (Cross *et al.*, 1995). There are approximately 4000 people living in the semi-urban township of Tendeni (Alcock, 1994), and 1625 farm residents living within the boundaries of the TBR (NPB, 1994). The total population of the Weenen district of the 1990 census was 12 456 with a population density of 14 km^{-2} (Cross *et al.*, 1995). In comparison, the total population of Msinga was estimated to be 102 064, with a population density of 59 km^{-2} (Cross *et al.*, 1995). The population estimated for Cornfields is approximately 2400 (Garland *et al.*, 1994). No data was obtained for eGodine, Tugela Estates, Tembalihle, or the Tent Towns.

The literacy rates for the Weenen and Msinga Districts was reported to be 38% and 54% respectively (Cross *et al.* 1995). Of the 614 adult farm residents living within the TBR boundaries, 30% were employed (NPB, 1994). Figures for unemployment in 1990 for Weenen was 7% while in Msinga it was 76%. Local communities are generally a very low income population, strongly tied to the local area, and depend to varying degrees, on access to land. Male absenteeism in 1990 was reported to be 16% and 55% respectively (Cross *et al.* 1995), although levels of migrancy are estimated to be lower than generally encountered in what was formerly known as KwaZulu, reflecting closer economic links to the area. Nevertheless, migrants' contributions to household income is substantial. Local wages appear lower than in the main centres resulting in especially low incomes. Some households have no income and rely solely on pension, informal sector earning, or agriculture. The importance of livestock to households is high, while crop production plays a minor role.

Most households have been found to depend on a range of income sources, and exhibit a strong rural orientation. Local sources of income tend to be more substantial than in most homeland areas suggesting more strongly developed links to the land and to the area (Todes and Krone, 1990). Other forms of reliance on the land include fuelwood, construction and craft materials, and medicine (personal observation).

4.3.8 Infrastructure, services and future development

Outlying farming districts of Weenen and Msinga have been marginal in terms of government spending on education and services (Cross *et al.*, 1995). The Weenen District is situated some distance from Natal's economic growth areas, markets and major transport routes. Weenen District has one small town of Weenen which has limited services primarily oriented towards serving local agricultural and consumption needs. Bulk purchases and purchasing of specialised goods are restricted to towns outside the district such as Estcourt and Ladysmith (Todes and Krone, 1990).

4.4 Summary

The study area can be summarised as exhibiting the following general characteristics. A combination of low and unpredictable rainfall, extreme temperatures, rugged topography, and erodible soils, makes most of the area low in productivity and retards regenerative capacities of the natural vegetation. The land also has marginal agricultural value. Interacting with these biophysical characteristics is an unusually high dependence on the land by impoverished black communities for grazing, cultivation, construction materials, fuel, medicine and food. Many black people have been evicted off the land of their forefathers and are now without access to these resources as the land on which they now reside is severely degraded. Land where these resources still abound is largely controlled by white farmers who deny access to members of resource-poor neighbouring communities and regulate access of farm residents.

Even if access was unlimited, the present natural resource base could not satisfy the demand in the area and therefore needs to be controlled. A thorough knowledge of the biophysical and social characteristics is extremely important as these characteristics place numerous constraints on the management of natural resources, and any recommendations made must bear these in mind.

CHAPTER 5

METHODOLOGY AND TECHNIQUES USED IN THIS STUDY

5.1 Selection of an appropriate methodology

It was realised early on in the study, after reading various reports and newspaper articles, and informal interviews with several key informants, that there was a long history of social conflict in the Weenen area. It was therefore deemed necessary to adopt a very sensitive approach for the study, and as a result, Rapid Rural Appraisal (RRA) was selected. RRA allows for rapid and progressive learning directly from local people. It also strives to offset outsider biases, and offers a large range of techniques that can be adapted for a particular research problem. As true participation and empowerment of participants were not attainable goals in this study, the approach could not be labelled PRA. This was largely due to the fact that the project had been identified by outsiders without participation or meaningful input from interest groups residing within the study area, and involved a research process that was almost entirely extractive by nature. Formal questionnaires were not considered appropriate in the light of the complex social dynamics operating in the area. The reason for this is that fixed-response questions are perceived to have limited capacity to ascertain perceptions and attitudes of people, may limit information flow, are inflexible, and generally do not have the capacity to build relationships between the researcher and the participants.

5.2 Description of the research process

5.2.1 The preliminary research phase

Pilot studies and exploratory visits were undertaken to identify and meet concerned parties, publicise the project, and gain understanding of the natural landscape, vegetation, local

conditions and infrastructure. A total of 14 days were spent in the field in order to prepare the way for the main research phase. Informal conversations with a small number of woodcarvers and other hardwood users were held in order to determine some of the hardwood species they utilised, as well as other information to aid in the formulation of a checklist to be used later on in the study. Markets held on pension days in the various centres were visited and these provided a great deal of information and contacts regarding natural resource utilisation. At these markets, many informal stores sold thatch, *iNcema* grass, knobkierries, traditional medicine (plant and animal parts), meat trays and spoons, brushes made out of grass, various beadwork attire, cow hides, chickens, home-made and factory made garments, fruit, vegetables, and meat. Meetings and interviews were set up and/or conducted with woodcarvers and nyangas at these markets..

A general meeting for TBR members was attended in order to introduce the team of researchers and explain the proposed project. Relatively few TBR members commented on the project or raised objections. Meetings were also arranged with the *amakosi* to ask for permission to conduct research and interview people in the areas over which they had jurisdiction. Development committees, NGOs and CBOs were also approached where possible.

5.2.2 The main research phase

The main research phase was carried out over four weeks in July 1995, and the secondary data review and preliminary visits proved to be invaluable in having prepared the groundwork. However, due to the intense conflict and mistrust in the area, it was still extremely difficult to conduct research as people were suspicious of outsiders and the research team's motivations for being in the area. It was also established during this period that many TBR members were extremely negative about the study. Reasons for this resistance included fears that the study would create an awareness of the value of slow-growing indigenous trees and cause an exploitation of this resource, as well as fears that the study would interfere with the running of their farms. Their silence at the general meeting and lack of response to requests for feedback prior to the main research, had thus been incorrectly interpreted to mean acceptance of the research proposal. Due to the

inaccessibility of many of the farm residents and members of neighbouring communities, and the nature of the study, information about the study provided during the preliminary visits had not filtered down, and these people were generally unaware of the study, and ignorant of its purpose.

Because the researcher was not fluent in Zulu, the language spoken almost exclusively by the farm residents and members of neighbouring communities, it was necessary to employ an interpreter. After discussions with various interest groups in the area, it was decided that the employment of a local person or persons, would be the most appropriate solution in the light of the mistrust and conflict in the area. However, there was no-one willing to assume this task as people said they were afraid of the ongoing taxi war in the area and inter-tribal conflict. A university student with experience in community-based development projects was therefore selected, and there were no perceived problems during the study as a result of employment of an outsider.

5.2.3 Selection of RRA techniques

Although preliminary visits and background information did provide some insight for the prior selection and sequencing of RRA techniques, it was impossible to provide an exact list of the methods that were to be used. Instead, it was thought that the research process should be allowed to evolve as the study progressed. The flexibility of RRA, and of qualitative techniques in general, allow for this kind of exploratory research to take place.

Despite attempts to conduct more visual and participative research exercises with respondents such as mapping, seasonality diagrams, and ranking exercises, most of the techniques employed were of a more verbal and extractive nature. These techniques, as described in more detail in Chapter 3, included direct observation and casual conversation. Many of these "casual" and informal conversations had with people of various interest groups, aided in rapport building with some people, and yielded information about the social tensions in the area. Interviews with key informants such as development committee members, traditional healers, and headmen on farms were also conducted. Semi-structured interviews, based on informed checklists were held with men and women of all ages, in

single-sex groups, mixed groups, as well as on an individual basis. These were mostly used to elicit information about natural resource use and management. The check list used covered all known uses of indigenous trees and other plants, with special attention to species names, specific uses and reasons behind their use, perceptions of the resource base, attitudes toward conservation, quantities used, harvesting methods used, and their perceived value.

Time lines and matrices were attempted but were not successful as they required more time than participants were willing to give, and were also found to be confusing. Accompanying participants into harvest areas in the bushveld as a form of transect walk was also unsuccessful, apart from an exercise with one woodcarver. The problem with conducting this technique was again related to time constraints, but also due to participants' fear of repercussions from the landowner who restricted harvesting in many cases.

5.2.4 Constraints governing the research process

As already mentioned, time constraints and lack of incentive on the part of the participants were some of the main factors influencing participation. In communities neighbouring the TBR, people often had other activities to attend to, and had to leave group discussions before they were completed. Within the TBR, many farmers allowed the researcher to interview farm workers, but it was clear that time spent with them was limited. On some farms, it was necessary to speak to workers during their lunch hour. Farm residents who were not employed at the time of the study, appeared more able and willing to spend more time discussing natural resource use. These people were mostly women and elderly men. Interviews with woodcarvers sometimes took place while they were carving as it seemed more appropriate to conduct semi-structured interviews with them as opposed to other methods which would interrupt their work. Due to the research focus of the study, and no perceivable benefits resulting from participation in the study, it is thought that people were less willing to give of their time and had little incentive to participate in the study.

A third factor that influenced the research process and selection of techniques was the need for confidentiality. Because harvesting of natural resources in certain instances had resulted

in arrests, fines and even evictions in the past, people were reluctant to volunteer certain information. Confidentiality was assured to participants in the hope that more accurate data would be elicited. It was extremely difficult to assess the accuracy of the information forwarded by participants, but information was often verified by other participants and interest groups. Techniques such as mapping of resource utilisation that would link people to a particular farm, and possibly cause further conflict between the resource users and resource owners/managers were considered unacceptable.

Prior to main research phase, it was realised that organisational alliance, actual or perceived, would play a large part in the researcher gaining acceptance or being rejected by various interest groups in the area. This is because there is much conflict between certain groups and individuals, such as conflict between farmers and farm residents, farmers and certain NGOs, and between various tribal groups. It was thus important for the researcher not to be seen favouring any particular group. It was fortunate that the NPB, who initiated the project and provided logistical support such as accommodation, were perceived to be a relatively neutral interest group in the study area.

5.3 Number, age and sex of participants

Permission from landowners was obtained in order to speak to farm workers during working hours, as well as other farm residents. Where possible, both men and women were interviewed. Often the nearest worker/s were summoned by the farmer to participate, and there was little control of ensuring good representation of age or gender. Records were kept during the study to ensure relatively equal representation of men and women, of a wide range of ages. Participants were not asked to indicate their age, but this was estimated. For example, it was possible to estimate the age of people who said they were pensioners as being over 60, and often people who were born on the farm reported for how long they had lived there. Most people who were interviewed were married and had children, although a few young single men and women were represented. No children were interviewed and their role in natural resource harvesting and utilisation is not known. Accurate and extensive demographic information was not specifically collected due to the limited time available and the limited periods spent with each person, and also because there is a fair amount of

information of this nature for these communities already (Todes and Krone, 1990; AFRA, 1991; Garland *et al.*, 1994; NPB, 1994; Cross *et al.*, 1995).

A total of 66 farm workers or residents, 26 men and 40 women, of various ages, from 12 farms were surveyed. On several occasions, interviews were held with individuals, while the largest group comprised 20 women. Seven farmers were interviewed in this study, and additional information was acquired from a research project run in conjunction with this study (Bill, 1995). Out of the six identified neighbouring communities, approximately 20 people from three communities were interviewed. Many meetings were set up with two other communities but this did not prove to be successful as no-one attended these meetings. Only five specialist, full-time carvers were located and these were all male.

5.4 Summary

Due to the flexible and informally structured approach employed in this study within the framework of RRA, it is very difficult to describe the exact methods used. This in turn makes it difficult for the reader to thoroughly assess the appropriateness of the methods used, and for the study to be easily replicated. These features, and the fact that the methodology relies heavily on the personality and experience of the researcher, may raise some criticism as to the reliability of the data. Furthermore, the predominantly qualitative nature of most of the information collected, makes for difficult analysis and reporting.

However, despite these potentially perceived shortcomings of this methodology, it is still argued that in light of the complexity of the social dynamics, and history of conflict in the area, RRA was the most appropriate approach for conducting research on natural resource utilisation for this particular study .

CHAPTER 6

THE SIGNIFICANCE OF INDIGENOUS TREES TO RURAL ZULU COMMUNITIES

6.1 Introduction

In the following two chapters (Chapters 7 and 8), the use of indigenous trees for woodcarving, house construction, firewood, medicine, and food by local communities within and surrounding the Thukela Biosphere Reserve is discussed. In order to understand the cultural, social and economic value behind the utilisation of these natural resources, it is necessary to explain Zulu history and culture to some degree and place the findings of this study (described in the succeeding chapters) within the context of others. This brief chapter is based on the findings regarding Zulu and other indigenous people's traditional use of indigenous trees as recorded by historians, anthropologists and resource ecologists. It must be noted that field guides of indigenous trees also provide valuable information with regard to resource utilisation (Palmer, 1977; Palgrave, 1988; Pooley, 1994).

6.2 Woodcarving

Many publications exist regarding the history of Zulu woodcarving (University of the Witwatersrand, 1986; Klopper, 1992), the products that are made (Grossert, 1978; University of the Witwatersrand, 1986; Klopper, 1992) and the processes and the tools that are used (Krige, 1965; Grossert, 1978; Hooper, 1981; Nettleton, 1991). However, there is a general lack of information regarding the accurate recording of species used, the economic importance of this trade and the impact that harvesting of wood for carving has on the resource base. A few studies conducted on woodcarving in Northern Maputaland, KwaZulu-Natal (Cunningham, 1987), the eastern Transvaal (Shackleton, 1993) and Namibia (Terry *et al.*, 1994), have attempted to address some of these issues. Recently

TRAFFIC (Trade Records Analysis of Flora and Fauna in Commerce) has commissioned an overview study of the woodcarving industry in South Africa. (Conrad Steenkamp, pers. comm.)

It is generally believed that the Zulus were conservative in the variety and style of woodcarvings they produced, and were even described by Bryant (1967) as being :

" ..... no great shakes at wood-carving..... being naturally deficient in artistic (or indeed any other) imagination or inventive power, their work always lacked decorative embellishments, and so was by no means comparable with the multifarious artistic products of the East African and Central Bantu craftsmen."

This is not to say that the work of Zulu woodcarvers was unimportant. Klopper (1992) reviewed various historical documents and argued that specialist carvers in the Nineteenth Century in Zululand played a crucial role "in the cultivation of a sophisticated and sometimes self-conscious identity at the courts of Shaka and his 19th-century successes". It is also argued that although Zulu art is essentially utilitarian, it is, and always has been, a vehicle for the expression of social as well as cosmological concerns (University of the Witwatersrand, 1986).

Traditional Zulu woodcarving is done exclusively by men (Krige, 1967). Some of the common-use articles carved are spoons, headrests, tall narrow milking vessels with small knobs or handles on either side, meat trays with four short legs, thatching needles, sticks, and clubs/knobkierries (Krige, 1965; Grossert, 1953, 1978; Bryant, 1967).

Many traditionally used household objects such as milk pails and head rests have now been replaced by modern fabrications (University of the Witwatersrand, 1986). In the study area and from other studies (Cunningham, 1987; Cleminson *et al.*, 1994), it would appear however, that meat trays and spoons are still very much in use in rural areas. Traditional weapons also remain very popular. Figurative sculpture, although never very prevalent in traditional Zulu art (University of the Witwatersrand, 1986), is becoming increasingly common in informal curio markets, especially those located in northern KwaZulu-Natal

(Cunningham, 1987; Cleminson *et al.*, 1994), in more formal markets such as the Durban African Art Centre[1], other art galleries and specialised curio outlets, and in the work generally of more formally trained Zulu sculptors as seen at a recent woodcarving workshop held at the Durban Technikon[2] , October, 1995.

Jack Grossert who was the Organiser and later Inspector of Arts and Crafts in the Bantu Education Department (Umgido, 1994) was very involved in promoting Zulu crafts within the "Bantu" education system during the 1950's. One of these crafts which he wrote extensively about and proposed in education manuals for teachers was woodcarving (Grossert, 1953; 1968). However more recently, art education is being challenged especially in more urban areas, as curriculae are becoming more "technically and scientifically orientated". This is likely to have an adverse effect on many potentially talented young African artists, who through art, would be able to become self-sufficient (Umgido, 1994).

6.3 Construction materials

The value and suitability to climatic conditions of Zulu-style houses has been discussed many times in the literature (Krige, 1965; Knuffel, 1973; Cunningham *et al.*, 1988), as has the process of construction and materials used (Knuffel, 1973; Cunningham and Gwala, 1986) . There have also been studies that attempt to link the use and need for building materials such as poles and laths with the resource base itself (Cunningham, 1985; Muir, 1990; Cleminson, 1993). The use of plants for building materials is thought to have four main advantages. Firstly, plants are a renewable source; secondly the harvesting, use and sale for this purpose generates income and preserves traditional building skills; thirdly, plant products are often available at low cost, and fourthly, traditional forms of thatched construction result in insulated housing well suited to African climatic conditions (Cunningham *et al.*, 1988).

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[1] African Art Centre, 8 guildhall Arcade, Gardiner Street, Durban, South Africa.

[2] Details about this workshop are provided in a newspaper article in Appendix 1.

There is a division of labour in the construction of houses. The men perform the rougher tasks requiring greater physical strength such as the actual harvesting of the poles and laths, and the construction of the frames for dwellings (Krige, 1965; Knuffel, 1973), while the women carry the poles to their homesteads (Krige 1965), fill in the walls and thatch the roofs.

Method of house construction, building styles and building materials vary with cultural group and environmental conditions. For example, the hut traditionally built by the Tembe-Thonga people on the coastal plain of Maputaland (Cunningham and Gwala, 1986) where there is no rock or clay for building purposes, or the similar dome-shaped or beehive style house of the amaNgwane peoples of the Upper Tugela (Knuffel, 1973), are both predominantly constructed from thin poles, laths, palm leaves, strips of bark, lianas, and thatching grass. Houses may also be built using mud or stones in addition to wood and thatch as found in the Msinga area. (Best, 1979; Milton and Bond, 1986). Poles that are favoured are usually termite-resistant (Milton and Bond, 1986)

However, the traditional style and methods of house construction are being replaced by the more modern, which Cunningham and Gwala (1986) refer to as "symptomatic of the cultural, technological and ecological changes" that are occurring in South Africa. However, it is also noted that for the majority of local people, indigenous plants still represent a low-cost building resource (Cunningham and Gwala, 1986) and although styles may change, the demand for indigenous plants, particularly indigenous trees for poles and laths, and the need for woodlots, is increasing (Cunningham, 1985; Muir, 1990).

Indigenous wood is also harvested for fencing poles. Branches of thorn trees are used for bomas to keep livestock from straying at night and protect cultivated fields during the day (Milton and Bond, 1986).

6.4 Firewood

In South Africa, the supply of electricity was historically biased towards urban centres and white settlement. The majority of the population residing outside this grid used alternative

energy sources such as wood, candles, paraffin, gas and dry batteries. Despite major electrification schemes that are now being implemented, many rural areas will be without electricity for many years to come and will continue to depend, as they have always done, on indigenous wood as a source of fuel. However, as the human population increases within these rural areas of South Africa where poverty is often severe, fuel in the form of indigenous wood will become increasingly scarce (Best, 1979).

In the light of this looming problem, many studies have been conducted regarding the consumption of firewood and the various social, cultural, political and economic factors affecting this consumption. As the collection of wood is primarily the task of women among many black communities (Gandar, 1991), many studies have also focused on gender (James, 1992). It is apparent from some of this literature that in remote rural communities where wood is free of charge, abundant and readily available, the practice of the use of firewood is unlikely to change in the near future (James, 1992). The perception of wood as a good fuel in areas such as these is grounded in the fact that it is cheap and readily available, that it is their (the people's) custom to use wood, that it suits the type of food cooked and the manner in which it is cooked (James, 1992). However, many communities are finding it increasingly difficult to access wood and are either having to purchase more expensive alternatives such as paraffin or gas, or use other unsatisfactory sources such as unfavourable tree species that produce hazardous smoke, the leaves and stems of *Aloe* species and crop residues which burn too quickly, and as a very last resort, dung which prevents important nutrients from returning to the soil (Best, 1979).

The fuel crisis within rural and peri-urban South Africa has stimulated the Department of Mineral and Energy Affairs into commissioning many research projects around the country. Recently, a number of regional Biomass Assessment Reports were published. The Biomass Assessment of KwaZulu-Natal assessed the utilisation of wood and other sources of energy by people living in the rural areas of the former KwaZulu homeland, analysed both the potential and current harvestable fuelwood yield, and compared current consumption of wood to the estimated supply (Mander and Quinn, 1995). This report found the dependence of rural households in former KwaZulu homelands to be high: it is reported that 95% of households used wood for heating water, 97% used wood for cooking and all households

used wood as a back-up energy source when they ran out the energy source they normally used. Most of this wood was reported to come from exotic trees whereas historically, indigenous trees were utilised. Monthly expenditure on wood varied between zero, R29.80 and R72.20 per household per month in various parts of the region. The average monthly household expenditure on fuel (all types) varied between 5% and 15% of total income.

The production of woody biomass was reported to be strongly related to climatic and topographic characteristics of a region. Based on the interpretation of satellite images and orthophotos, and studies on savannah productivity and amounts of firewood harvestable, the production of firewood (tons per year) was estimated. These figures were then compared to the consumption estimates (tons per year) and it was found that consumption and production were of the same order of magnitude but that if consumption was in the moderate to high category, demand was likely to have exceeded supply. It is also important to note from this report that inequitable production of fuelwood occurs across the region, with patches of extremely high production located within areas of predominantly low production. The report concludes with recommendations for policy and strategies relating to the sustainable utilisation of woody biomass resources in KwaZulu. Some of these strategies include the importation of wood, small-grower-development, social forestry, and woodland management.

6.5 Medicine

Traditional medicine is a very important part of South Africa's health care system and is professionally administered by specialist healers, the *isangomas* and the *nyangas*. This system depends largely on the availability of indigenous plant species[3]. There has been a lot of research focused in the past few years mainly on the species used, but also to an extent on the economic value of trade in medicinal plants and the impact of this trade on the resource base. Out of all the ethnobotanical research currently being conducted in South Africa, plants used medicinally are receiving most of the attention. Cunningham (1991;

[3] Traditional medicines are also made from animal parts but were not relevant to this project.

1992) has been especially active in this field of research providing valuable insight into the use of indigenous plants for medicinal purposes.

It has been estimated that the vast majority of people in Africa use traditional medical practitioners as a source of health care, and the majority of the plants used for this purpose are harvested from the wild, and many species are facing disappearance, at least locally. The most vulnerable species are popular, slow reproducing species with specific habitat requirements and a limited distribution (Cunningham, 1992). Management proposals for endangered or declining species include *ex situ* conservation such as cultivation in nurseries, or *in situ* conservation which would involve intense management within and outside protected areas. Traditional healers have also been found to practice various conservation measures and often have extensive indigenous knowledge regarding the ecology of various species.

6.6 Food (fruit)

Many studies have emphasised the importance of fruit in terms of the diet and nutrition of many indigenous peoples of South Africa such as the Tembe-Thonga of Natal and Mozambique (Felgate, 1982), the Zulus in northern Maputaland (Cunningham, 1985) and local people in the Eastern Transvaal (Dzerefos *et al.*, 1995). Not only is the fruit of trees eaten whole, but wine and other fermented drinks are also produced from certain species, an important one being *Sclerocarya* spp. (umGanu) (Felgate, 1982). This product is not only enjoyed by the household, but also used to entice help of neighbours and passers-by in the construction of houses (Bryant, 1967; Krige, 1965), and even more significantly, it can be sold to generate much needed income (Felgate, 1982). The sale of fruit is also known to supplement household income in certain areas (Dzerefos *et al.*, 1995).

The availability of specific fruit types is strongly related to ecological zones and seasonality. The importance of fruit to a particular community is also dependent on the availability of other food sources throughout the year and income availability. Fruit was found to play an insignificant role in human nutrition and only eaten as a relish in areas, for example, where there was an abundance of land available for cultivation, food available throughout the year,

and adequate income such as cash sales from the sale of dagga (Felgate, 1982). In some studies, people perceived certain trees to bear fruit even during periods of drought (Dzerefos *et al.*, 1995) which may be important as famine-support.

It would appear that much of the expertise and traditional knowledge surrounding the harvesting and preparation of indigenous fruit is disappearing in some communities. In one study, it was reported by the older women that the children were not as sick and as hungry "in their day" as they are today because women used to know better how to gather food from the forests and from the veld (Felgate, 1982). In other regions such as the Eastern Transvaal, the younger generation still enjoyed the indigenous fruits as much as their parents, although this did not apply to the use of indigenous herbs (Dzerefos *et al.*, 1995). Many thorn trees produce gum from stem wounds, and this sweet, chewy substance is collected and eaten by children as a candy substitute (Milton and Bond, 1986). Also documented is the nutritional value of the pods, leaves and seeds of species such as *Acacia tortilis* and *Dichrostachys cinerea* as fodder and browse for livestock (goats and cattle) and game (Milton and Bond, 1986).

6.7 Other uses

Although there are many other uses for indigenous trees, only a few examples are provided. The roots and barks of certain *Acacia* species are used for tanning the pleated leather skirts (isidwaba) traditionally worn by married women in some areas (Milton and Bond, 1986). The pods, fruit, leaves, bark, twigs and roots of some indigenous trees are also the sources of dyes (Milton and Bond, 1986; Cunningham, 1987). Dense and resilient wood of certain trees make for durable tool handles and benches. Thorns may be used to remove splinters from the skin or pierce ear lobes (Milton and Bond, 1986).

6.8 Indirect environmental and social benefits of indigenous trees

Apart from the above mentioned benefits and commercial value of indigenous trees, a number of environmental and social benefits also need to be recognised. These are often difficult to quantify in terms of economic values (Myers, 1988). For example, the aesthetic

value of trees and their place in community life is difficult to express in monetary terms such as the provision of safe roosts for poultry, shade for herders and their livestock and venues for family and community gatherings (Milton and Bond, 1986). Tree legumes make large amounts of nitrates available in the soil and can enhance pasture grasses and annual food crops (Milton and Bond, 1986). Furthermore, trees protect against soil erosion and safeguard watershed systems (Milton and Bond, 1986; Myers, 1988).

6.9 Summary

The value of indigenous trees to Zulu rural communities is obviously enormous, and diverse. Their utilisation is made further complex from various interacting ecological, social and economic factors, and appears to be constantly changing. The effect that utilisation has on indigenous trees and the environment is not fully understood in many cases, and much more research is needed, especially for non-medicinal plants. Efforts also need to be directed towards formulating management plans for sustainable utilisation of indigenous trees including both *ex situ* and *in situ* approaches. This is important not only for the prosperity of the resource base and ecosystems, but also for the prosperity of traditional customs and the ability to meet basic needs of rural people.

CHAPTER 7

WOODCARVING IN WEENEN

7.1 Introduction

There is virtually no information on woodcarving in the Weenen District except a brief mention that there was trade of "wooden pillows" (headrests), spoons and walking sticks, among other traditional products such as clay vessels, woven grass-mats and skin "petticoats" recorded in the late 19th-century (Burton-Clark, 1985). Hooper (1981) in her review of historical and anthropological literature, museum collections and fieldwork undertaken in the late 1960s and early 1970s, records the manufacture and use of headrests, meat trays, a variety of spoons, knobkierries, sticks, and spear-shafts in Msinga, an area adjacent to the Thukela Biosphere Reserve (TBR).

7.2 The woodcarvers

There were very few specialist woodcarvers located in the Weenen area, and there was not a great variation in the type and style of carvings produced. There were no woodcarvers, apart from men who made knobkierries and spears, who lived on farms within the TBR. It was reported that two woodcarvers had been evicted from farms within the past year, and it was confirmed that the reason for the eviction for at least one of these men and his family was because he was caught harvesting an indigenous tree. Many men resident on farms were hesitant even to talk about the knobkierries they carved for fear of repercussions. Men who lived outside the TBR in resource-poor neighbouring communities often poached wood from property within the TBR and were aware of the risks involved. Harvesting of wood was regarded in a very serious light by the land owners. Information collected from these farm residents and members of neighbouring communities is thus presented in such a way as to not link them geographically to any part of the TBR or neighbouring areas.

Only men were found to partake in woodcarving and this is consistent with other findings (Krige, 1965; Bryant, 1967; Grossert, 1968). Reasons for this division of labour could be a combination of the heavy manual labour involved in harvesting the trees, lack of time on the part of the women who are already heavily involved in other domestic activities such as fetching water and firewood, and an acceptance by the community that woodcarving is strictly a man's occupation; there tends to be a natural division of labour in Zulu culture. Only woodcarvers who worked at their trade on a full-time basis were available for discussions. People who carved on a part-time basis were at work during the week, and attempts to locate them on the weekend were unsuccessful. However, it was possible to interview men who carved knobkierries and sticks for spears. These carvers were of all ages. In contrast, the men who carved meat trays and spoons were in their mid-forties and older. The majority of carvers worked without assistance from family members or other persons.

7.3 Training and woodcarving experience

The men who manufactured articles out of wood can be grouped into specialist carvers who produced items such as meat trays, spoons, and spear shafts, and non-specialist carvers who made knobkierries for themselves for everyday use. This is basically a distinction in the time spent, as well as the skill and knowledge required for producing a particular item. For specialists, woodcarving was generally their only form of employment. Four of the specialist carvers learnt their trade from their fathers and/or grandfathers, and have been carving since they were boys. The fifth specialist carver interviewed, who was thought by local people to make meat trays of superior quality, taught himself out of necessity for generating income. He worked previously in a timber factory and had not been able to find other suitable employment. At the time of the study, he had been practising his trade for 15 years.

Only one man, a carver who produced articles for the curio industry, was passing his carving skills onto others. Although he was not teaching pupils at the time of the study, he usually had three students, none of whom were relatives. He did not charge them for lessons but kept a percentage from the sale of the products they made. One of the other carvers said that although children enjoy watching him work, they showed no desire to learn his trade.

However, it was also reported that young children are learning to carve from their parents or brothers and take their crafts or handwork to school to show the class. Two teachers at a farm school confirmed that they are not actually teaching this skill at school but that the children learnt at home. Unfortunately this information was only elicited towards the end of the study, and there was no time available to explore it further. However, it was possible to glean some information on this subject from the literature. Zulu woodcraft at school level has been described by Grossert (1968; 1978), and a manual on how and why to include woodcarving as part of the school curriculum was produced by the same author in 1953. Together with information gathered in this study, it may be possible to recommend that woodcarving be promoted at school level as part of the education curriculum, as a way of reintroducing traditional knowledge of plants and perhaps a possible avenue of income generation in an area which has high levels of unemployment.

7.4 Woodcarving products

Despite the limited amount of woodcarving in the study area, a variety of products are made. A summary of products and species preferences is provided in Table 6.1. For convenience they are categorised in the following way: traditional weapons (knobkierries, spear shafts, and shield staves), traditional household implements (spoons, meat trays and moulds for weaving beer strainers) and non-traditional ornamental objects (spoons, bowls, animal carvings, busts or statues, and masks).

Species		Trad. weapons			Trad. household implements				Non-trad. products			
Scientific names	**Zulu names**	K/krre	Spear	Sh/stv	M/tray	Spoon	Mould	Spoon	Bowl	Anml	Bust	Mask
Indigenous species												
Acacia sieberana	umKhamba				3	3						
Berchemia zeyheri	umNcaka				4	6		1	1			
Brachylaena elliptica ?	iPhalha	1		1								
Buddleja saligna	uNqandambazo	1										
Combretum apiculatum	umBondwe-omnyama								1			
Cussonia sp.	umSenge				1							
Dichrostachys cinerea	umGagane	1										
Dombeya cymosa	iGcibo	2		1								
Ehretia rigida	umHlele/umKlele		4									
Euclea crispa	umGcalanci/umGcalancu	1										
Grewia flava ?	umHlabampunzi	2										
Grewia occidentalis	iNhlolo/iKlolo	1										
Olea europea. africana	umNqumo	13			3	2		1	1	1	1	
Pappea capensis	imVuma/umVuma	1										
Ptaeroxylon obliquum	umThathi/umThathe	1										
Schotia brachypetala	umGxamu				4	1						
Spirostachys africana	umThomboti									1	1	
Tarchonanthus camphoratus?	iGqeba-elimlophe											
Vepris lanceolata	uMozane	4										
Vitex rehmannii	umDuli/umLuthu										1	1
Zanthoxylum capense	umNgumabele	2										
?	iliLwane	1										
?	uMombu/uMumbu						1					
Exotic species												
Melia azederach	umSelinga				1							
Bottlebrush	?				1							
Jacaranda	?				1							
Pine	?			1								
Poplar	?					1						

Table 7.1 Indigenous and exotic tree species that are utilised for carving. Unconfirmed scientific names are marked with question marks.

7.4.1 Traditional weapons

7.4.1.1 Knobkierries

The majority of Zulu staffs serve a dual function as walking sticks and clubs or knobkierries, and are carried daily by men. Many of these have large bulbous heads, and they may be used as defensive weapons against wild animals or snakes in the veld, or else against human attackers. In some instances the shaft is decorated with simple incised designs or covered in copper wire and more recently, brightly coloured plastic cord. With the exception of clubs with crudely carved heads, staffs with figurative carvings are virtually unknown in KwaZulu-Natal (University of Witwatersrand, 1986). The knobkierries in the study area were generally undecorated and had large bulbous heads (see Plate 7.1).

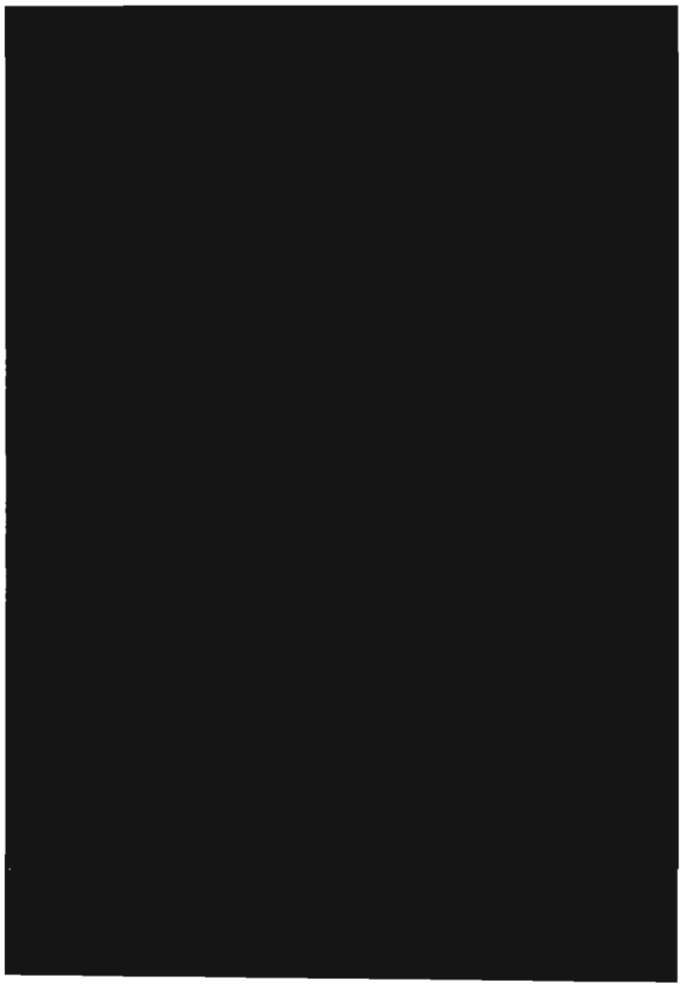

Plate 7.1 Photograph showing two knobkierries made from *Olea europea* subsp. *africana*.

Of the men interviewed who produced knobkierries, it was reported on at least 13 separate occasions that *Olea europea* subsp. *africana* (umNqumo) was used. Brief discussions with many of the sellers of knobkierries on pension days confirmed this species to be the most commonly used. Only branches were used and not whole young trees. The reason that this species was the most popular is said to be that it was very strong[1]. One man harvested the roots of *Olea europea* subsp. (umNqumo) that protruded from the riverbed and reported that the tree did not die from this practice. Another species that was reported to be used, but that was not nearly as popular, was *Vepris lanceolata* (uMozane). Other species mentioned by one or two persons were *Buddleja saligna* (uNqandambazo), *Dichrostachys cinerea* (uGagane), *Dombeya cymosa* (iGcibo), *Euclea crispa* (umGcalanci), *Grewia occidentalis* (iKlolo), *Pappea capensis* (umVuma), *Ptaeroxylon obliquum* (umThathi), and *Zanthoxylum capense* (umNgumabele). The scientific name of two species referred to as umHlabampunzi and iPhahla could not be confirmed, but in accordance with Pooley (1994), may be *Grewia flava* and *Brachylaena elliptica* respectively. An unidentified species referred to by local people as iliLwane was also mentioned and this Zulu name could not be located in any of the literature or field guides such as Palmer (1977) and Pooley (1994).

The time taken to make a knobkierrie was said to vary from person to person. One carver said he could make 15 a day if he sat for a whole day and carved, while another said that it took him a few hours to make one knobkierrie after the wood had been dried. Others said they could make 30 a month, or the equivalent of one a day. None of the men made knobkierries as a full-time occupation so the number they were able to produce depended on the spare time they had available. Availability and access to wood was also a factor that affected the number of knobkierries produced.

7.4.1.2 Spear shafts

Four men were found to make spears and they all used *Ehretia rigida* (umKlele) for the shafts because it is a very strong wood. Coloured wire from telephone cables was reported to be woven on occasion around the shaft for decoration. One man reported that it was very

[1] When one carver was asked if the knobkierries made from *Olea europea* subsp. *africana* (umNqumo) ever broke, he replied that naturally they did, because even God (Jesus) died.

important to carve when the wood was dry and that he took three days to make one spear. Examples of the type of spear that is made in the Weenen area are presented in Plate 7.2.

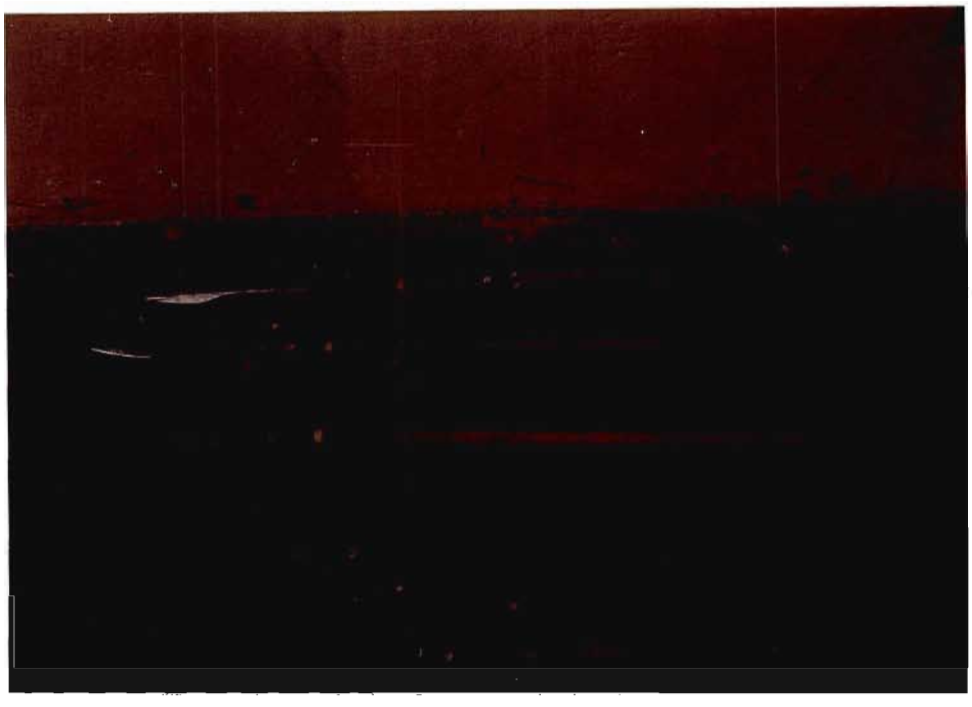

Plate 7.2 Photograph of spears made from *Ehretia rigida* in the Weenen area. Note the decoration on the shafts.

7.4.1.3 Shield staves

Only one carver was found to make staves that are placed through loops of cow hide at the back of traditional shields. The wood used for these staves are pine, *Dombeya cymosa* (iGcibo), and iPhahla, which is thought to be one of the *Brachylaena* species. The top of the stave is decorated with the pelt of small wild cats. The appearance of these shield staves is shown in Plate 7.3.

Plate 7.3 Shield stave made from (from top to bottom) pine, iPhahla, and *Dombeya cymosa* (iGcibo).

7.4.1.3 Constraints

No carver complained about the availability of markets for selling knobkierries and spears. However, access to the wood itself was found by many people outside the TBR to be a problem, particularly illegal harvesting on private property which could result in prosecution. One man reported that he did not harvest from the farm on which he lived for fear of being arrested. Another who resided in a neighbouring community, said he would continue to harvest *Vepris lanceoalata* (uMozane) and *Olea europea* subsp. *africana* (umNqumo) from a privately-owned farm in order to make knobkierries, even though he had been arrested and fined before for this practice.

7.4.1.4 Economic value

Many men reported to carve knobkierries for their own personal use while a significant proportion made them to sell, either for orders or for sale at the informal market on pension days. The average price for a knobkierrie was R10, while some sold for R15, locally or in Johannesburg. One man reported that he sold his knobkierries for between R20 and R30

each depending on the size, but this was inconsistent with many other men who sold knobkierries they made for R10. It was also reported by one carver that out of all the wooden products he made, such as spoons, meat trays and spears, knobkierries showed the biggest turnover because they were the easiest to make. He sometimes made and sold 15, 20 or even 30 a week, but he did not make them every week as it was a problem to access wood. One man said that on occasion he took a bundle of knobkierries to Johannesburg, the number depending on the amount of wood he was able to steal. The spear shafts were reported to sell for between R30 and R35, and shield staves for R35.

The commercial value of these sales should not be underestimated as in some cases the sale of a single knobkierrie is equal to or more than a day's wage for a farm labourer. Production of knobkierries thus served as an important supplement to income for many men.

7.4.1.6 Conservation ethics

Harvesters were very aware of only taking branches so as not to kill the tree, and they also preferred an older tree as they could obtain the desired "knob" shape on the end of their sticks. When one man was asked if he practised any conservation measures he specifically gave the example of knobkierries, for which only branches were used in order to prevent tree mortality.

7.4.1.7 Perceptions of resource availability

Perceptions of farm residents regarding the availability of wood varies. Generally it was reported that there were many *Olea europea* subsp. *africana* (umNqumo) trees on the farms on which they lived. Other species that were reported easy to find on the farms on which they resided were *Dombeya cymosa* (iGcibo), *Ptaeroxylon obliquum* (umThathi), *Vepris lanceolata* (uMozane), and *Zanthoxylum capense* (umNgumabele). The scientific names of two species mentioned, umHlabampunzi and iPhahla were unconfirmed but may be *Grewia flava* and *Brachylaena* elliptica respectively (Pooley, 1994). An unidentified species referred to by local people as iliwane was also mentioned. This Zulu name was not

located in any of the literature or field guides such as Palmer (1977) and Pooley (1994). It was also mentioned that there were many seedlings of these species around and that a decline in the availability of these species had not been noticed. On another farm, a group of men said that there was not enough *Olea europea* subsp. *africana* (umNqumo) trees in their area but that this had always been the case.

Members of neighbouring communities felt it a problem to access the wood as it grows within "fenced places" i.e. on privately owned land within the TBR, and they risk prosecution to acquire it. A few individuals did report that they have been arrested before for this reason.

7.4.1.8 Attitudes of TBR members towards the harvesting of wood for knobkierries

Many farmers were strongly opposed to the harvesting of wood for knobkierries because they believed that entire young trees were destroyed to make these products. However, in all cases it was reported by the carvers that only branches are used. Some farmers reported that they had a serious problem with outsiders poaching their wood for knobkierries and that these people were difficult to catch. Farm workers or residents were generally hesitant to provide information about the manufacture of knobkierries as the harvesting of wood on the farm on which they reside was in many cases prohibited by the farmer. A second concern raised by some farmers, was that they associated knobkierries with fighting and violence, and therefore did not want to sanction their production.

The manager at the Weenen Nature Reserve, said that although any proposals for resource utilisation would have to be passed by management, he thought that harvesting *branches* only of *Olea europea* subsp. *africana* (umNqumo) would not be a problem in terms of sustainability. This would obviously depend on the total demand for this species.

7.4.2 Traditional utilitarian /household implements

Traditional utilitarian products that were made and sold in the Weenen area were meat trays (uqwembe/iqoko/isithebe), a selection of spoons (izinkhezo), and moulds (umbhuku) for

weaving beer strainers (amavovo). There was no evidence of wooden mortars for grinding maize, wooden milking pails or traditional headrests. The possible reason for the absence or knowledge of wooden mortars is the availability of suitably shaped and sized rocks in the area that are used for grinding maize. This is unlike certain areas in northern Zululand where rocks are unavailable and wood is used instead (Cunningham, 1987). More recently, however, other factors have contributed to a general decline in local people grinding grain in the Weenen area. These include drought or the prevention of cultivation by farmers. This has resulted in people either buying ground maize from stores or receiving it as part of their rations from farmers in the case of farm workers. No information on milk pails was elicited in the area and this could be as a result of their replacement by galvanised iron buckets which are considered much more hygienic and easier to wash (Grossert, 1968). The fact that no headrests were found to be produced by carvers in the area is consistent with the literature that headrests are rarely used or commissioned now but are often kept as ancestral relics. Alternatively, they may be buried with their owners (University of Witwatersrand, 1986).

7.4.2.1 Meat trays (iziqoko)

An example of the type of meat tray produced in the area is provided in Plate 7.4. It was difficult to elicit the demand for meat trays in the area. Many people were not sure of the number of these items in their households and simply replied that the number depended on the size of the family and the amount of money available. One woman said that she owned three meat trays, and the number normally ranges from 1-4 per family. Generally, a family has one large tray for meat from which it is served onto smaller ones. They are generally not for every day use but reserved for special feasts. Meat trays may be borrowed from neighbours if a family does not have sufficient number. All people interviewed said that there were no woodcarvers living on the farms who made meat trays, and that they had to purchase them on pension days at Msinga, Tugela Estates or Cornfields. One woodcarver stated that he did not sell many meat trays because they lasted a long time. Only one family reported to be using western-style platters in place of traditional forms.

Plate 7.4 Meat trays produced in the Weenen area. These examples are made from *Acacia siberiana*.

The process involved in producing a meat tray and the tools used

The time taken to produce a meat tray varied among carvers from 2 medium sized trays in one day or one large one per day, to one tray per two or three days. One carver said he made as many as 30 for selling at pension days but the number was dependent on the availability of wood. Generally, the trays were not made in succession but each stage was completed for several trays before the next stage was started. Wet wood was generally preferred as it was reported to be softer and therefore easier to carve. The process for meat tray production is described as follows: the tree or branch is chopped down with the use of an axe or saw, and then chopped or sawn into logs which are transported to the carver's house either carrying the logs (several trips are needed), using a wheel barrow or in rare cases, a motorvehicle. The logs are then sawn longitudinally into two halves. Each half was then carved into a meat tray. The wood is then smoothed with a file or sandpaper. The process up to this stage of meat tray production is illustrated in Plates 7.5 to 7.10.

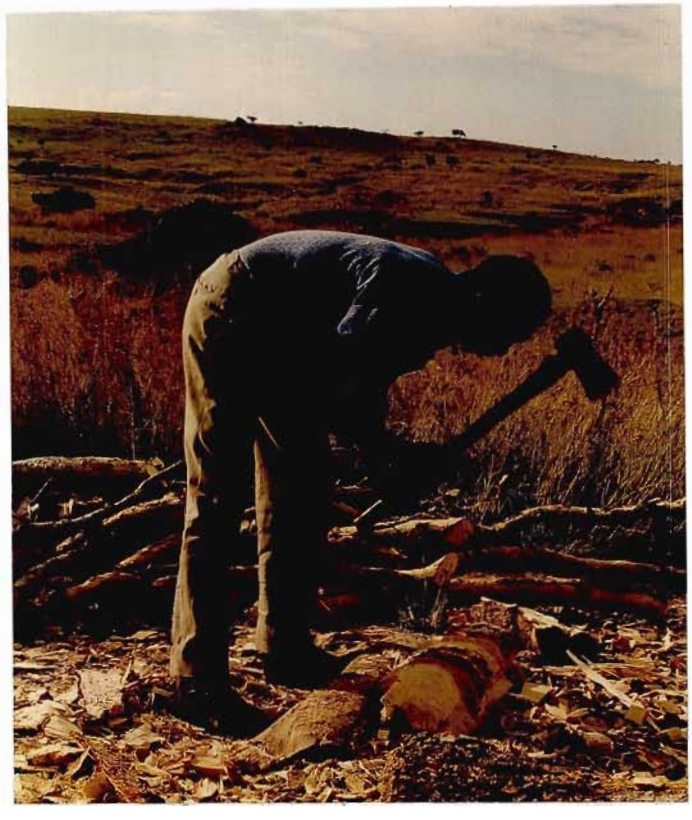

Plate 7.5 The carver is beginning to shape the *Acacia siberiana* log with an axe.

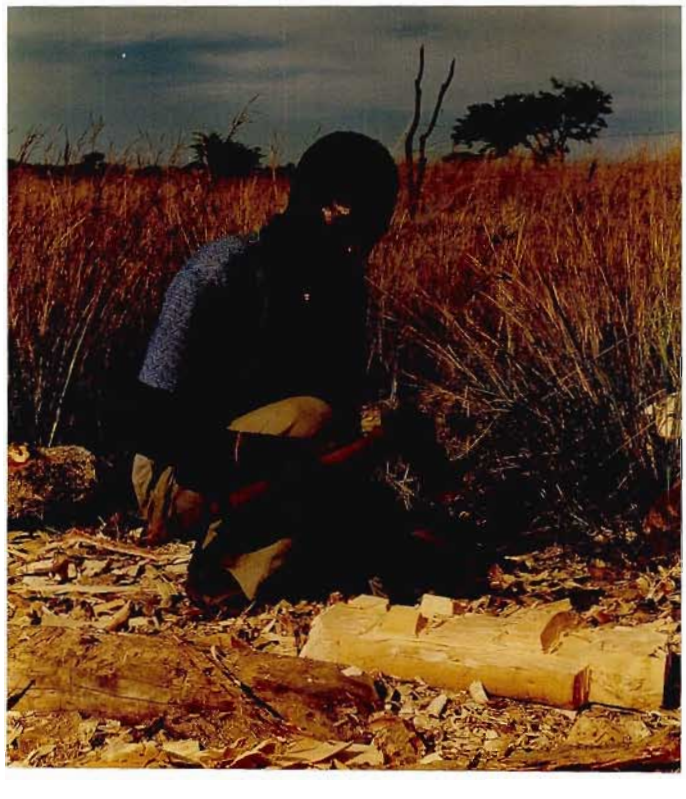

Plate 7.6 The form of a meat tray is appearing.

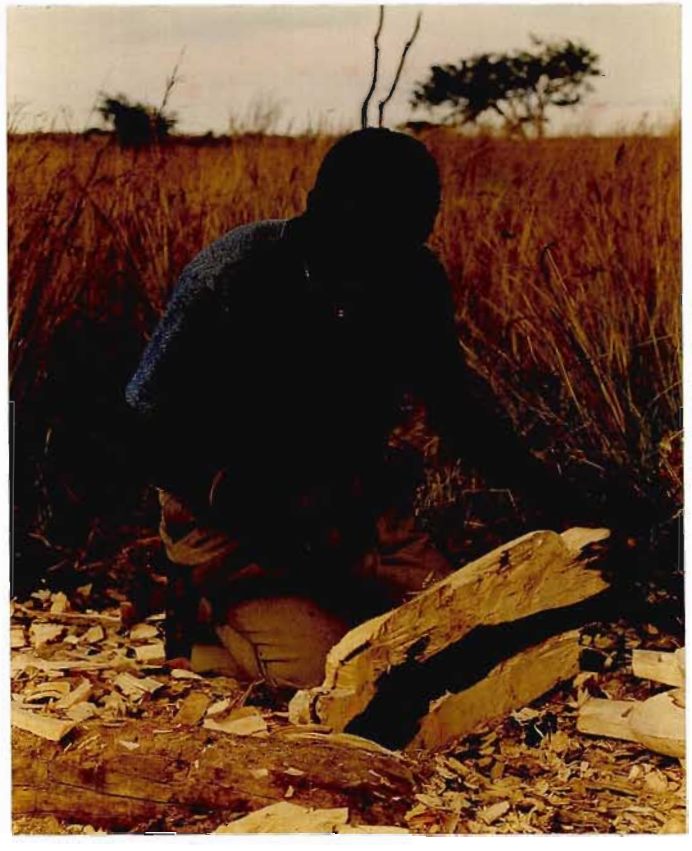

Plate 7.7 Still with the use of an axe, the meat tray is further shaped.

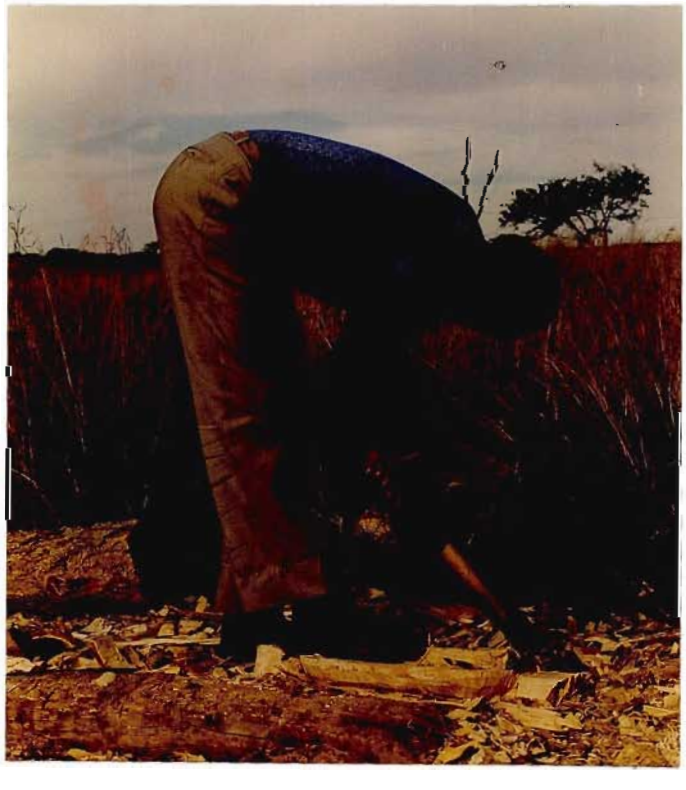

Plate 7.8 An adze is being used to hollow out the centre of the meat tray.

Plate 7.9 A file is used to smooth the edges.

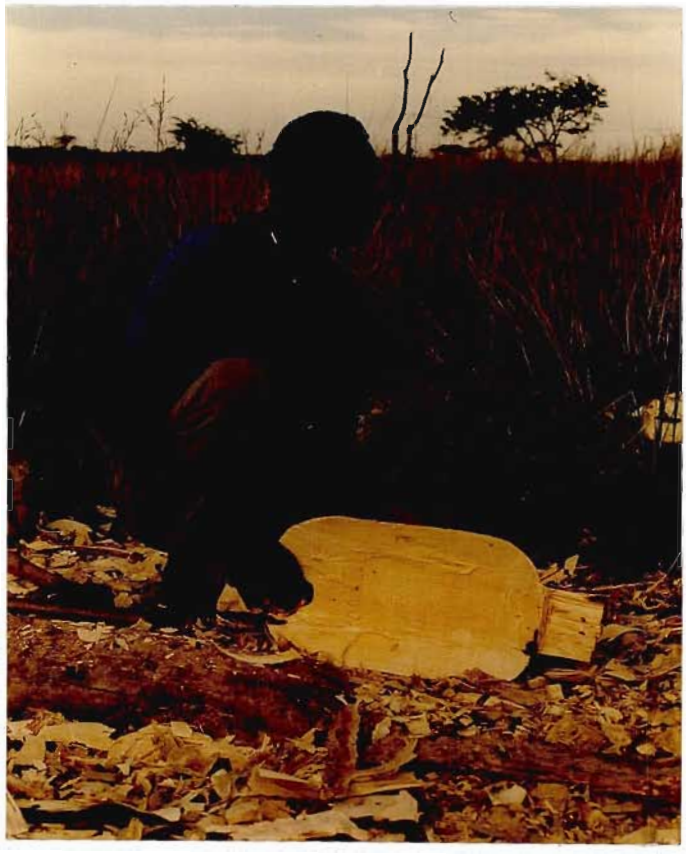

Plate 7.10. The meat tray is almost ready for the blackening process.

When all the meat trays from one tree or branch are at this stage, a hot fire is made, metal is heated and part of the outside is blackened for decoration. Depending on the carver and the wood, fat is then applied. One woodcarver uses pig fat to stop *Berchemia zeyheri* (umNcaka) from cracking while another uses cow fat to rub onto the blackened parts of *Acacia siberiana* wood to enhance its appearance.

Species used

Four species, *Acacia siberiana* (umKhamba), *Berchemia zeyheri* (umNcaka), *Olea europea* subsp. *africana* (umNqumo), and *Schotia brachypetala* (umGxamu) were commonly used by woodcarvers to make meat trays, depending on the availability of the trees in their area, the size of meat tray required, and the individual preference of the carver and buyer. *Cussonia sp.* (umSenge), a much softer wood, was also reported to have been used in the past. One carver said that he did not use *Schotia brachypetala* (umGxamu) because it was prone to destruction by termites. This, however, was disputed by other carvers using this species. One woodcarver said that he had heard that willow (scientific name unknown) was also good for carving, but that he had not tried it as it grows on privately-owned farms and was therefore not accessible to him.

In agreement with one woodcarver, the research team provided *Eucalyptus grandis* (Blue Gum) logs for experimentation. The woodcarver produced three large meat trays (see Plate 7. 11) and found the wood easy to carve. Unfortunately the wood cracked upon drying and it is therefore deemed an unsuitable substitute for indigenous trees normally used[2]. *Melia azedarach* (umSelinga) was used by one woodcarver when he received orders for very large meat trays. This species may be a suitable substitute. Meat trays made from bottlebrush and jacaranda were also located at the Wagendrift Craft Centre, west of Estcourt.

[2] This was confirmed by other woodcarvers at a workshop held in October 1995 at the Natal Technikon Sculpture Department.

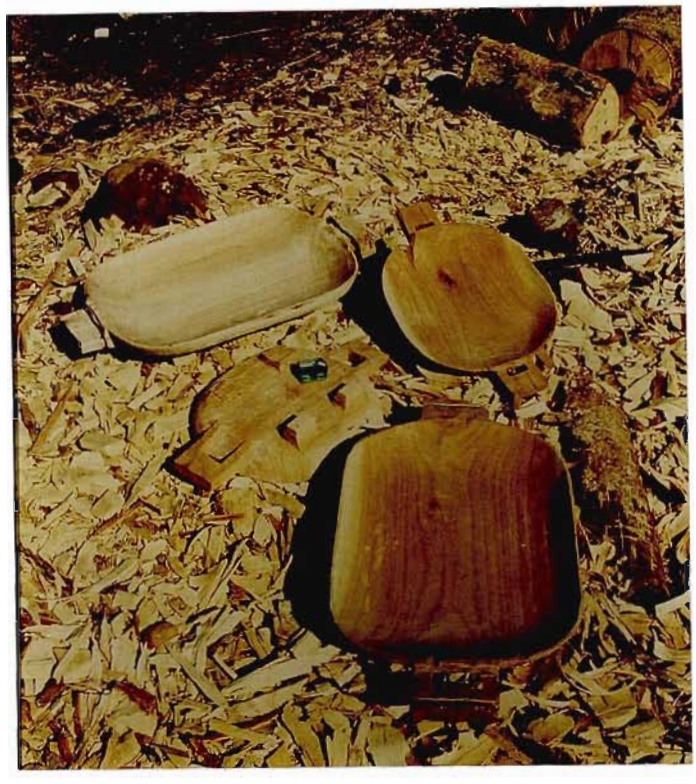

Plate 7.11 Meat trays produced from Blue Gum wood. The wire visible in the photograph was used to prevent the trays from breaking apart.

The quantities of wood used, and the size classes and shapes targeted, were difficult to ascertain as they appear to be very variable. It was also difficult for woodcarvers to remember how many trees they harvested or how many products they made in a given time period. The information elicited therefore permits only crude estimates of wood consumed during a given time period.

One carver who only made use of *Acacia siberiana*, harvested one large or two small trees a month. The selection criteria he used were size and shape. Trees had to be straight and relatively large. Trees that were partly rotten due to bark removal for medicinal purposes were not used. Another carver, who also used predominantly *Acacia siberiana*, only selected an individual tree if it was straight and large enough to cut two logs from it, to enable him to carve 4 meat trays simultaneously. Carvers typically used large trees to produce large trays, and either branches, or small trees to produce small trays.

A woodcarver who harvested *Olea europea* subsp. *africana* (umNqumo) and *Berchemia zeyheri* (umNcaka), used branches of trees for producing small trays and tree trunks for larger ones. He was able to produce 6 meat trays from big or old trees and four from young trees. Another said he used between four and six trees of these same species per month.

Questions were also asked regarding the height at which the tree is cut from its base, and whether or not the trees were coppicing or showing signs of regrowth. One carver said that if the tree was suitable, he would cut it right at its base near ground. He had noticed that many of the trees he had cut previously had coppiced. He was not certain as to why some coppiced while others did not. Three *Acacia siberiana* trees he had previously harvested were examined. Two trees had both been cut in September 1994, and after approximately 10 months, the tree that had been cut approximately 40 cm above ground level showed much coppicing (see Plate 7.12). However, the other, cut 10 cm above ground, had only coppiced slightly (see Plate 7.13). A third tree, harvested in December 1995, 40 cm above ground level and situated on the edge of an erosion gully with some roots exposed, had coppiced, but the new shoots, approximately 30 cm high, had been intensively browsed by goats. The other carver who also made use primarily of this species said he had not noticed trees shooting after they have been cut, but then added that a young tree would reshoot.

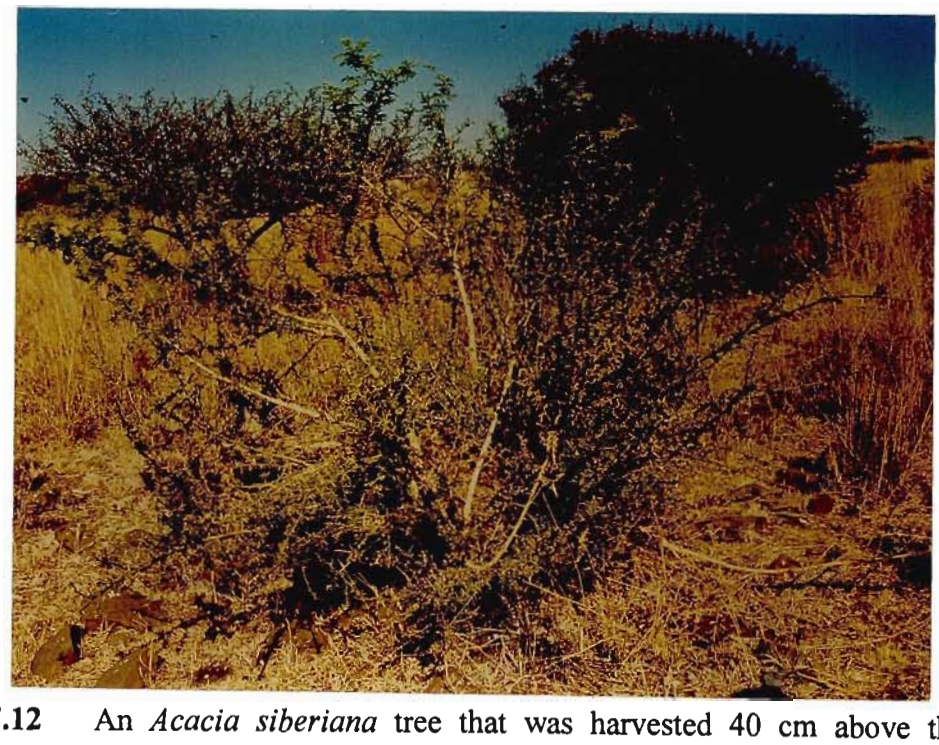

Plate 7.12 An *Acacia siberiana* tree that was harvested 40 cm above the ground exhibiting coppicing. The arrow shows the position of the cut stem.

Plate 7.13 An *Acacia siberiana* tree that was harvested 10 cm above the ground. The arrow is pointing to the very small amount of coppicing that has occurred.

A carver who used other species such as *Olea europea* subsp. *africana* (umNqumo), *Berchemia zeyheri* (umNcaka) and *Schotia brachypetala* (umGxamu), said he cut the trees about 30 cm above ground level, and some reshoot or coppice. Another carver said he deliberately cut a tree 60-70 cm off the ground because he wanted it to reshoot and grow again.

Constraints

The main constraints that these carvers faced were the availability of markets and availability and access to an adequate supply of wood. Both these factors limited the amount of income they earned and rendered woodcarving sales insufficient to support their families. Markets were localised, and limited in most cases to orders received and pension day sales. Asked if there was competition between woodcarvers, all replied that there were not many carvers in the area and therefore competition was limited. Apart from the carvers who had access to wood on communal land, the others stole wood from privately-owned

farms and ran the risk of being arrested. One of the woodcarvers said that he had approached many farmers for wood but they had always turned down his request, except perhaps if the wood was dead.

Perceptions of resource availability

A carver who used *Acacia siberiana* (umKhamba) exclusively harvested the trees from the surrounding area of communal land, that had recently been acquired by the community. He was finding it increasingly difficult to find large trees necessary for his trade. Another carver, who lived in a community nearby, also said that he had to travel very far to harvest *Acacia siberiana.* One of these men said that he expected to have exhausted his supply within the next few years. A reason given for this was that indigenous trees used for carving grow very slowly and trees that are now of a harvestable size were present when he was a young man. He was the only person harvesting *Acacia siberiana* in his area at the time of the study and reported that it was not used for fuel because the smoke produced burns the eyes.

Others carvers making use of *Olea europea* subsp. *africana* (umNqumo), *Berchemia zeyheri* (umNcaka) and *Schotia brachypetala* (umGxamu), said that there were not enough of these trees in the veld. They reported that there used to be many trees, but they were presently difficult to find, and only available in a few places. In the case of *Olea europea* subsp. *africana* and *Berchemia zeyheri* in particular, they reported that they were only harvested if they had been specifically commissioned. One carver said that he would probably stop carving when his supply on the farms was exhausted. At the time of the study, he provided the only source of income for his family.

Conservation value

Regulations set by one community committee neighbouring the TBR disallowed the harvesting of small trees, but allowed the harvesting of large individuals. In another neighbouring community, one woodcarver said that there were no special rules for carvers. A carver who was exceptionally aware of conservation measures and very knowledgeable

about indigenous trees, their growth and biology, said that he deliberately did not cut a tree close to its base as he wanted it to reshoot and grow again. He said that people selling plant material for medicine without the necessary qualifications or permission had not been trained about plants and did a lot of damage to the resource base.

Economic value

The price for which meat trays were sold varied, depending on the size. Small trays ranged in price from R15 to R30 (approximately 40-50 cm in length and 25cm in width), medium trays sold for approximately R35 to R55 (approximately 60-70 cm in length and 35cm in width), and large trays (approximately 80-90 cm in length and 45 cm in width) ranged from R90 to R120, occasionally selling for R200. Sizes that fell in between these approximate size categories were priced accordingly. One carver said that he sometimes decreased the price depending on the buyer, should bargaining occur. The meat trays were produced largely for the local market, and together with spoons, often sold at informal markets held on pension days (see Plate 7.14). Only two carvers sent their meat trays elsewhere, occasionally to Pietermaritzburg, or even to Durban and Johannesburg where they fetched a higher price. Meat trays were sold either through orders or at local pension days which appeared to provide a large informal marketing opportunity for many products.

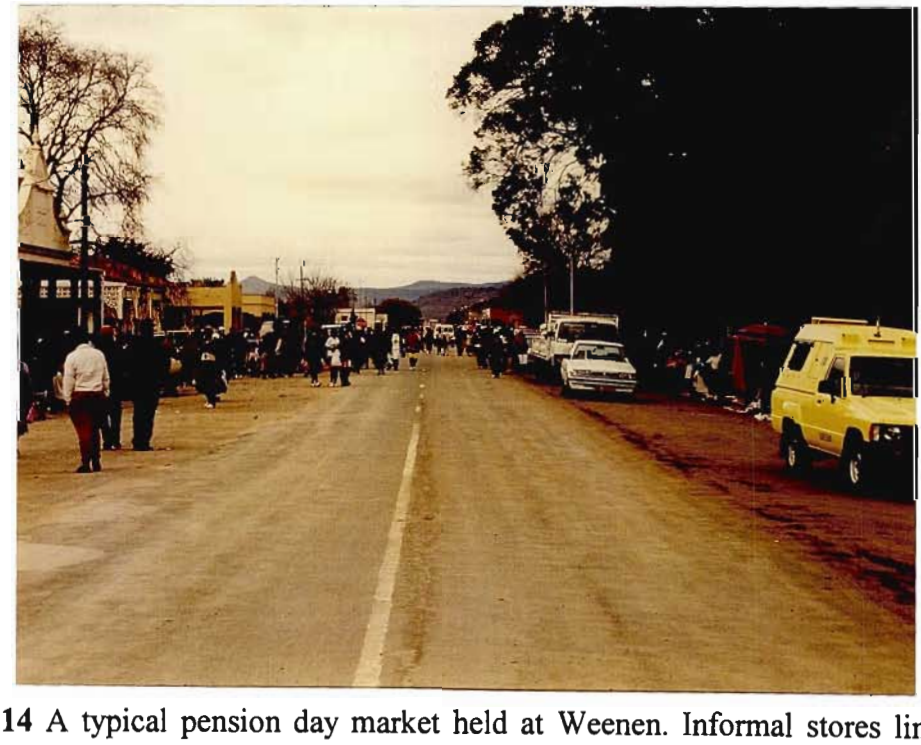

Plate 7.14 A typical pension day market held at Weenen. Informal stores line the main road.

It was extremely difficult to ascertain the monthly or average income that was acquired through the sales of meat trays. Sales were reported to be uncertain. Information about income was considered sensitive and it was difficult to ask directly, especially in the presence of other family or community members. One woodcarver estimated that he made approximately R1000 bimonthly. Others simply said that the income derived was inadequate.

Farmer's attitudes

All the farmers interviewed said that they were not aware of anyone on their farms who carved meat trays. One farmer did report that he had evicted a man for harvesting a large *Acacia siberiana* (umKhamba) tree. He said that this carver had cut a tree down to make only one meat tray, and that the rest of the wood was wasted. The carver, however, said that he had an agreement with the farmer that he could harvest trees providing he did not harvest particular species[3]. The carver claimed to have abided by these regulations, and stated that the son of the farmer caused his eviction, even though he had permission from the father[4]. On this particular farm the farm residents said that a second woodcarver had also been evicted but this was not confirmed with the particular farmer involved, nor was it established whether carving was the reason for the eviction.

7.4.2.2 Spoons

The same four species of indigenous trees that were used for making meat trays were used for making spoons, namely *Olea europea* subsp. *africana* (umNqumo), *Berchemia zeyheri* (umNcaka), *Acacia siberiana* (umKhamba) and *Schotia brachypetala* (umGxamu). Poplar was also found to be used at the Wagendrift Craft Centre, west of Estcourt.One carver said he only used branches to make spoons and he waited for the wood to dry before carving them. The spoon was then sanded using sandpaper, and finally decorated using a heated

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[3] These species were *Olea europea* subsp. *africana* (umNqumo), iGqeba, *Schotia brachypetala* (umGxamu) and *Berchemia zeyheri* (umNcaka).

[4] Inconsistencies between farmer and son/farmer and manager of regulations regarding natural resource use is reported to be the cause of much conflict between the farmer and farm workers and is discussed in Chapter 10.

metal tool. Small spoons used for eating maas or large spoons (izixembe) for stirring or serving, took only a couple of hours and 10 could be produced in a day.

Perceptions of resource availability

Perceptions of resource availability were similar to those for meat trays as the same species were utilised. However, as spoons are smaller and require less wood, there was generally perceived to be an adequate supply. Often offcuts of wood left over from meat tray production were used, although smaller branches harvested from living trees were also used.

Economic value

Prices of spoons varied depending on the size and type of spoon, and the seller. The price ranged from R1 for very small spoons for administering snuff, to R13 for large spoons for stirring or serving. The maas spoons sold for R5 each, or R45 for 13 spoons if bought in bulk. The spoons for stirring or serving (isixembe) sold for R8 each or R45 for 13 if bought in bulk. One carver also made very small spoons for administering snuff and other medicine, and sold 12 for R12. The number of spoons that a carver sold per month depended on local orders, although he also received orders from overseas through visitors to whom he had sold in person on previous occasions.

7.4.2.3 Moulds (umBhuku) for making beerstrainers (amavovo)

uMombo/uMumbu (scientific name unknown) wood and sisal stems were selected for making the moulds for the weaving of beerstrainers as they are light in weight. uMumbu wood was said to be "poached" off private farm land. Only two of the carvers interviewed made these moulds, and one reported to sell them for R6. There was no great demand reported for these moulds, as they were said to last a long time, and fewer women were weaving beerstrainers than before.

7.4.3 Non-traditional objects

Only one woodcarver was found to carve objects that were not traditionally part of the Zulu culture. In terms of distance, he was not considered to belong to a community neighbouring the TBR, but was included in the study because of the nature of his work and the difference in the market he supplied. He comes from a line of woodcarvers and had been practising for 17 years at the time of the study. Much of his inspiration is said to come through dreams. He used to sell to Vukani, a craft organisation at Eshowe, but said he and other woodcarvers he knows stopped selling to this retailer because they felt the prices that they were being offered were too low. At the time of the study, he sold to a hotel in the Valley of a Thousand Hills, to which his brother delivered his carvings every three weeks.

7.4.3.1 Products made and species used

This woodcarver used 5 species of indigenous trees. He made spoons, meat trays and bowls from *Berchemia zeyheri* (umNcaka), spoons, bowls and ornamental carvings, such as birds and human figures or busts from *Olea europea* subsp. *africana* (umNqumo), human figures or busts, animals and birds from *Spirostachys africana* (umThombothi) and *Combretum apiculatum* (umBondwe-omnyama), and masks and statues from *Vitex rehmannii* (umDuli/umLuthu). He used mostly wood of *Olea europea* subsp. *africana* (umNqumo), followed by *Berchemia zeyheri* (umNcaka). Plates 7.15; 7.16 and 7.17 are examples of products made.

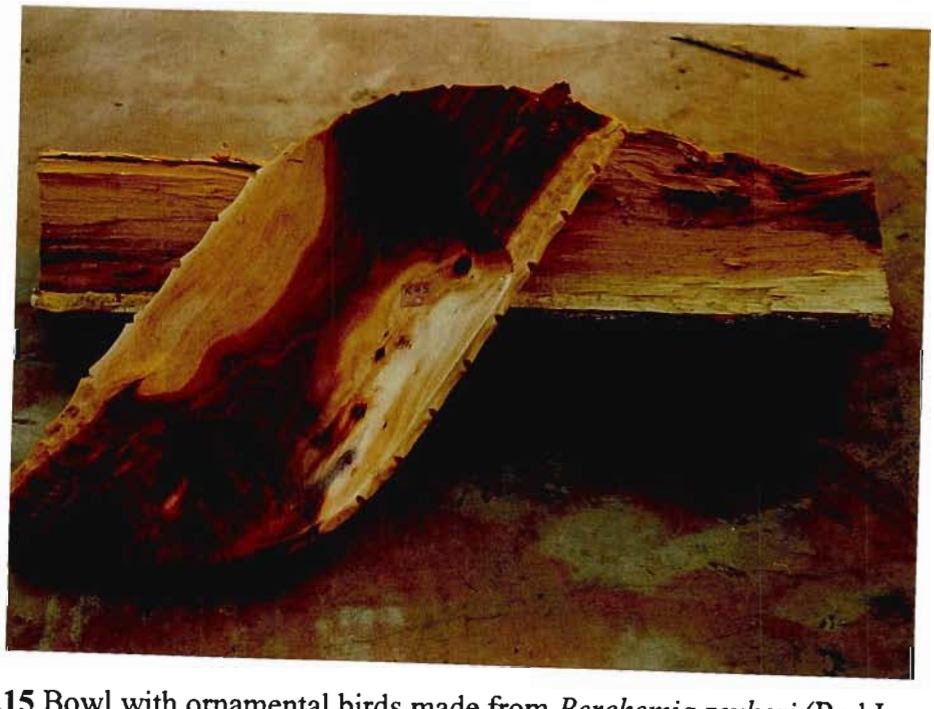

Plate 7.15 Bowl with ornamental birds made from *Berchemia zeyheri* (Red Ivory).

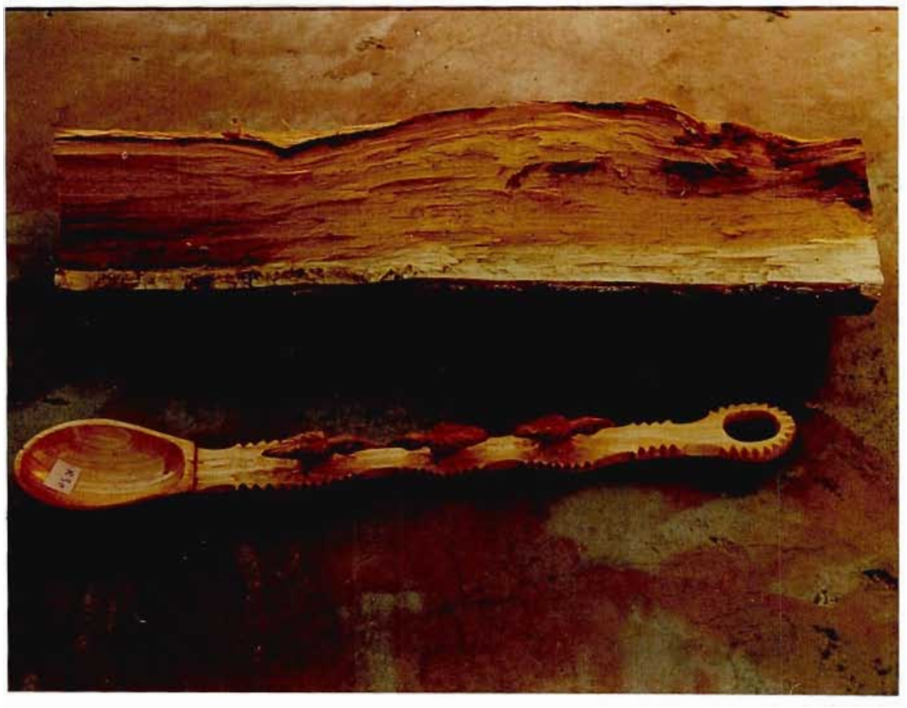

Plate 7.16 Decorative spoon made from *Berchemia zeyheri* (Red Ivory).

Plate 7.17 Statue/bust made from *Olea europea* subsp. *Africana* (Wild Olive).

The tools he used included an axe for chopping and a saw for cutting into smaller logs, as well as an adze to finely shape the carving, and sandpaper and files for the final smooth finish. These tools are shown in Plate 7.18 and are similar to those used by carvers described elsewhere in this chapter. In rare cases, this particular carver hired a vehicle for transporting wood, but this depended on available finance.

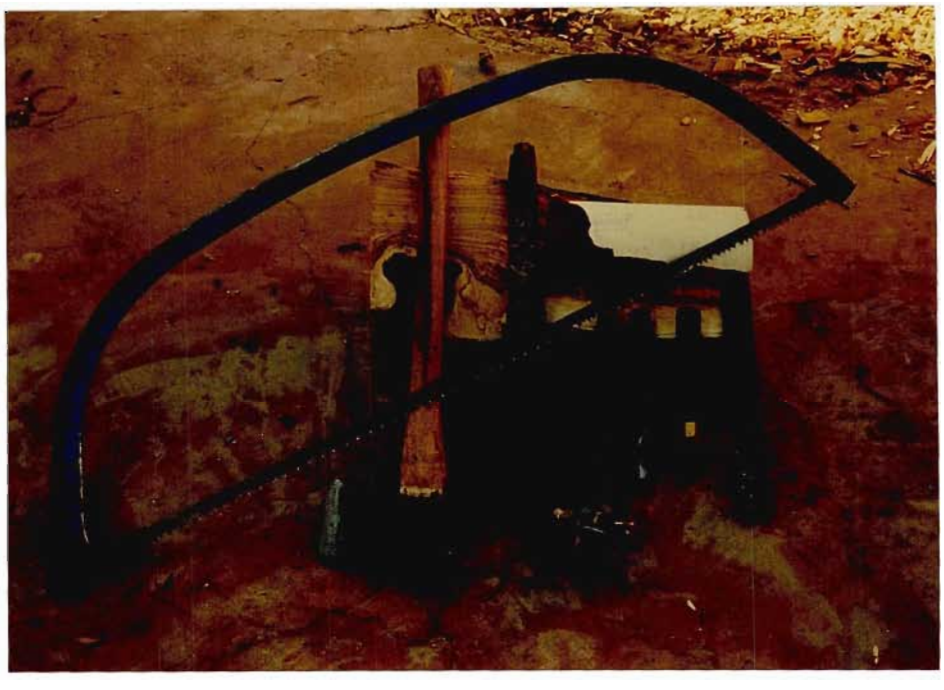

Plate 7.18 Tools used for woodcarving. From left to right: a saw, two axes, an adze, two chisels, a file, and sandpaper.

It took this carver one day to make a bowl and a spoon, and he estimated that on average, he made 8 spoons and two bowls a week. This number depended very much on the demand. It was not possible to accurately estimate how many trees he harvested as it depended whether the wood was hard or soft, living or dead, the number of logs that could be cut from branches, and whether it was necessary to harvest the whole tree. A rough estimate was given as one or two trees per week. In rare cases people informed him about available wood, but he needed to hire transport to fetch the wood. He reported that a tree usually coppiced after harvesting, but reshooting was dependant on adequate rainfall.

7.4.3.2 Conservation ethics

This carver harvested his wood several kilometres away in the forests on the sides of a mountain on tribal land. Woodcarvers in the area were required to obtain written permission from the *inkosi* ("chief"), and although there were no special rules, it was understood that the *inkosi* preferred trees not to be cut off right near the ground. He said that woodcarvers only cut the tree right at its base if the tree was dead, otherwise they made use of branches. For his carvings he used live and dead wood. However, *Berchemia zeyheri* (umNcaka) had to be carved wet because it became too hard when dried.

7.4.3.3 Perceptions of resource availability

This woodcarver had been carving for 17 years and in the past he used to collect wood close to his house. But since the drought in the 1980s and intense pressure on indigenous trees from women collecting firewood, he has had to travel far (several kilometres) to harvest his wood. He said that the place from where he collected had many seedlings and there were no goats there to destroy them. However, *Spirostachys africana* (umThombothi) and *Combretum apiculatum* (umBondwe-omnyama) were especially difficult to find.

7.4.3.4 Constraints

The biggest constraints he experienced were insufficient tools, lack of assistance, and lack of accessible markets locally. He would prefer it if he could concentrate solely on carving while others harvested the wood and sold his products. Asked if many people stop by because they see the sign advertising his presence, he replied that they did but that it was time to get a new sign which was more formal than the existing sign erected in 1969, and one that would display the distance. He reported that the number of visitors to the area was declining, particularly that of foreign visitors. He reported that there were three other carvers in the area, but that there was not much competition amongst woodcarvers as their products were sufficiently different in style.

7.4.3.5 Economic value

Spoons were sold for between R25 and R30 while bowls were sold for R45 on average. The busts or statues were sold for R90. He reported that his spoons showed the highest turn over. Woodcarving was his only source of income and his wife sometimes contributed to the household's income through her sewing. He did not view his contribution from carving as adequate to support his family.

7.5 Discussion and recommendations

7.5.1 Quantifying wood use for woodcarving

The information obtained in this study regarding the amount of wood consumed and income generated is mainly qualitative, as is the case with the majority of other studies conducted on woodcarving (Shackleton, 1993; Terry *et al.*1994). The reason for this is that the quantities of wood of each species used are very variable, as are the sales of products. Shackleton (1993) found that production and therefore the derived income varied considerably from month to month depending on the availability of dry wood, wood size and species, finance, time of year, working order of machinery, success with selling stocks, and number and type of orders. It was found in that same study that many of the woodworkers experienced several months of the year without income. In the case of the present research project, it was not considered viable to have people invest effort in maintaining diaries as there are so few woodcarvers in the area. Furthermore, as monthly consumption of wood and resulting income generation is so variable, only a long-term study would provide quantitative information of any real value. Memory and recalling of information also played a major role, especially when eliciting information such as quantities of wood used, number of products sold, and income derived. Many of the carvers said that they could not remember how many products they made or how much wood they harvested.

Due to this qualitative nature of the information, it is difficult to link this data with quantitative information collected in the ecological study. Even in a study where weights of

wooden items were recorded over a period of several years, it was found that there was no precise method of relating these weights to the standing crop or productivity data. Reasons for this include the great variation in the size of wooden articles produced, in the degree of wastage that occurs, and in the growth rates of the species used (Cunningham, 1987). Furthermore, it is very difficult to elicit precise information on selection criteria used in harvesting wood, and to link it with the availability of suitable trees or branches in terms of their size, and more problematic, their shape. The selection of wood for carving is a learnt skill and one that is difficult to approximate. An added constraint in this project, was that it was impossible to accompany woodcarvers on a harvesting visit into the field as they often harvest wood illegally from private properties. As such, carvers did not want to risk being arrested. This also made it difficult to determine whether trees coppice after harvesting. Coppicing information and visual demonstration of selection criteria was only possible with one woodcarver who harvested only *Acacia siberiana* in a communally-owned area.

The range of species utilised reflects varying combinations of preferred species and species availability. This was also found to be true in the Ingwavuma District in KwaZulu-Natal, where the use of craftwork materials, including wood for the carving industry, reflected the local availability of materials (Cunningham, 1987). However, many of the species preferred in this study for carving such as *Olea europea* subsp. *africana* (umNqumo) and *Berchemia zeyheri* (umNcaka) may be disappearing and in a few years time other less favourable species may be forced into use. Although it is perceived by the woodcarvers that there is no competition between them as specialist users of wood, it was reported that competition for commonly used species by non-specialist users does exist, for example, the collection of wood for fuel. Species that are sought after for a number of uses include *Berchemia zeyheri* (umNcaka), *Olea europea* subsp. *africana*, *Schotia brachypetala* (umGxamu) and *Vepris lanceolata* (uMozane). It is therefore important to consider these species in particular in terms of their distribution and abundance for management purposes.

7.5.2 An appraisal of the woodcarving industry in Weenen

The potential to establish a sustainable woodcraft industry in the Weenen area depends on the fulfilment of many criteria such as:

- the availability of species favoured by woodcarvers and buyers of carvings;
- the willingness of the farmers to allow harvesting of these trees on their property;
- the availability of markets;
- the willingness of woodcarvers to be trained to advance their current skills to a certain marketable standard; and
- the willingness and ability of organisations in the area to co-ordinate training workshops, administration, and transport required by this industry to make it viable.

The ability to meet the these criteria was partially determined in this study and is as follows:

- the availability (abundance and distribution) of indigenous tree species is still to be determined in a separate ecological study;
- the farmers were generally not supportive of this project nor do they appear willing to allow additional harvesting of wood on their farms, especially slow growing species such as *Berchemia zeyheri*, *Olea europea* subsp. *africana* and *Schotia brachypetala*, and especially if large specimens are required;
- with growing interest in the tourist industry from overseas visitors, it would appear that with the correct approach and marketing skills, woodcarving products of acceptable standard could generate much needed income. The Natal Parks Board in particular, has access to an extensive marketing network with curio outlets in many of their protected

areas, and may have the administrative skills and capacity to distribute woodcarving products;

- the woodcarvers are already skilled in working with wood, and with the correct tools and exposure to different styles, it is thought that they could meet marketable standards; and

- locally-based organisations that potentially have the capacity to oversee the harvesting of wood, facilitate training workshops and/or transport carvers and their products are the Natal Parks Board (NPB), the Rural Foundation, CAPFARM Trust, members of the TBR, especially the TBR committee and the committee of eight farm worker "representatives", the TBR anti-poaching unit (APU), and CBOs such as development committees. However, not all these organisations or structures are on equal footing in terms of administrative skills, finance and manpower and much time and money would need to be invested in order to co-ordinate the promotion of a viable woodcarving industry in the area.

It would thus seem that there are two major constraints in promoting this industry. Farmers are unwilling to allow access to suitable carving woods and there is a lack of the infrastructure necessary to co-ordinate the training of woodcarvers and the transport of products to markets, especially as the carvers live great distances apart. Even if the land owners agree to provide the necessary wood and had the assurance that their trees would not be overexploited, a large investment in terms of time and money would still be required. In view of the fact that only a small group of people, the men who carve and their families, would directly benefit from this investment, and the immense social conflict in the area, it is recommended that more basic needs[5] are first met.

7.5.3 Potential markets and future arrangements

The African Art Centre based in Durban is currently selling wooden sculptures, mainly to foreign tourists, for between R300 and R1000 per item. Presently, the demand is greater

[5] Basic needs such as firewood (energy), water, grazing and cultivation.

than the supply but the stability of this market is doubtful (May, pers. comm.). Buyers are critical of the craftsmanship and the wood used. Preferred wood includes *Berchemia* spp. (red ivory) and *Olea europea* subsp. *africana* (wild olive). This is consistent with the findings in a study in the Eastern Transvaal where carvers can sell products made from these species for a higher price (20-25%) than similar products made from wood such as kiaat (Shackleton, 1993). However, it is not likely that the products made by the woodcarvers in the Weenen area would match up to these demands as the products they make are for use and not objects of art. It is not known how the products made by the one woodcarver who lives outside of the Weenen area would be received and it is suggested that his products be taken to this centre to test their marketability.

The Natal Parks Board has access to a large marketing network as it supports a number of curio outlets at its game reserves. Contacts have also been established with international markets in the United Kingdom (Pete Koekemoer, pers. comm.). In the area the Natal Parks Board has been responsible for establishing two curio outlets, at the Weenen Nature Reserve (Siyafunsisana) and the Wagendrift Craft Centre, west of Estcourt. However, problems are experienced with Siyafunsisana, to which the people in the study area have access. A taxi war in the area has made transport unsafe and unpredictable, transport is expensive, there is a general lack of visitors to the Weenen Nature Reserve and very few of these visitors purchase the craftwork available[6].

[6] Mainly beadwork and basketry, but a few carved spoons were seen at the time of the study.

CHAPTER 8

USE OF TREES FOR CONSTRUCTION MATERIALS, FIREWOOD, MEDICINE AND FOOD IN WEENEN

8.1 Introduction

Information regarding the use of indigenous trees other than for woodcarving was also collected as it was considered necessary to determine the degree of competition between woodcarvers and other wood users. This information was elicited predominantly from farm residents. Local people reported using trees for building materials, firewood, medicine, and fruit. Occasionally other uses such as yokes for oxen and tool handles were mentioned, but these uses did not account for a significant amount of wood harvested.

8.2 Construction materials

8.2.1 Introduction

It was found that the labour involved in house construction was generally divided by gender. The men harvested the poles and built the frames while the women filled in the frames with mud and thatched the roofs. However, widows reported that they harvested the poles in the absence of their husbands. The majority of houses that were seen within the TBR and surrounding areas had thatched wooden-framed roofs supported by mud-packed wooden-framed walls. Beehive-style houses were rarely seen but did exist. Some houses had corrugated roofs but these too were seldom seen. The photograph below shows a "typical" house in the Weenen area in the process of construction with its wooden wall and roof frames (Plate 8.1). Access to indigenous trees for building is a very important resource for these farm residents as many are living below the poverty line and money for alternative materials such as corrugated iron and building blocks is generally not available.

Plate 8.1 A typical dwelling in the Weenen area.

8.2.2 Species used in house construction

Twenty-three indigenous tree species were reported to be used for the construction of the walls of houses, whereas predominantly wattle, and sometimes gum were used for the roof framework. The list of species used in house construction is provided in Table 8.1 and 8.2.

Preferred species			**Less commonly used species**		
Scientific name	**Zulu name**	**No.**	**Scientific name**	**Zulu name**	**No.**
Poles for roof frames					
Wattle	?	11	*Acacia nilotica*	iSanqawe	1
			Eucalyptus spp.	?	2
			Vepris lanceolata	uMozane	1
Laths for weaving					
			Diospyros lycoides ?	umNqandane	1
			Dombeya cymosa	iGcibo	1
			Olea euorpea. africana.	umNqumo	1
			Ziziphus mucronata	umPhafa/ umLahlankosi	1
			?	iKhati	1
Door frames					
			?	uGodide	1
			?	umQathonga	1

Table 8.1 A list of species that are used for roof poles, laths for weaving, and door frames. The number of times a use was reported is recorded in the table.

Preferred species (in order of NBce)			Less commonly used spp (alph. order)			Species avoided (alph. order)		
Sci. name	**Zulu name**	**No.**	**Sci. name**	**Zulu name**	**No.**	**Sci. name**	**Zulu name**	**No.**
Acacia nilotica	iSanqawe	15	*Acacia karroo*	umuNga	2	*Acacia karroo*	umuNga	1
Vepris lanceolata	uMozane	7	*Acacia robusta*	umNgamanzi	1	*Acacia tortilis*	umSasane	1
Olea europea subsp. africana	umNqumo	7	*Acacia tortilis*	umSasane	2	*Boscia albitrunca*	umVithi	1
Vitex rehmannii	umDuli/umLuthu	6	*Brachylaena ilicifolia*	iGqeba	1	*Spirostachys africana*	umThomboti	4
Acacia caffra	umTholo	5	*Clerodendrum glabrum*	uPhehlacwathi	1			
Dombeya cymosa	iGcibo	4	*Combretum erythrophyllum*	umDubu	1			
Ziziphus mucronata	umPhafa/ umLahlankosi	3	*Dichrostachys cinerea*	umGagane	2			
			Ehretia rigida	umHlele/umKlele	1			
			Euclea crispa	umGcalanci	1			
			Grewia occidentalis ?	iNhlolo/iKlolo	2			
			Melia azededarach	umSelinga	1			
			Pappea capensis	umVuma	1			
			Ptaeroxylon obliquum	umThathi	1			
			Spirostachys africana	umThomboti	1			
			Zanthoxylum capense	umNgumabele	1			
			?	iLulwane	1			
			?	isiQoqoba	1			
			?	umFikijolo	1			

Table 8.2 Tree species, mostly indigenous, used for poles for the wall framework of dwellings in the Weenen area. The number of times the use of a particular species was reported is recorded in the table.

Acacia nilotica (iSanqawe) was found to be the most commonly used and preferred species harvested for poles for the walls of houses and the reasons given for its preference were that the trees produce straight poles and the wood is more resistant to termites than other species. Other commonly used species included *Vepris lanceolata* (uMozane) as it produces straight poles, *Olea europea* subsp *africana* (umNqumo) as it is resistant to termites, *Vitex rehmannii* (umDuli), *Acacia caffra* (umTholo), *Dombeya* cymosa (iGcibo) and *Ziziphus mucronata* (umPhafa).

Species that were only reported on one or two occasions to be used for poles to build the walls of huts included *Pappea capensis* (umVuma), *Ptaeroxylon obliquum* (umThathi), *Euclea crispa* (umGcalancu), *Brachylaena ilicifolia* (iGqeba), *Grewia occidentalis* (iKlolo), *Zanthoxylum capense* (umNgumabele), *Ehretia rigida* (umKlele), *Acacia robusta* (umNgamanzi), *Dichrostachys cinerea* (uGagane), *Acacia tortilis* (umSasane), *Acacia karroo* (umuNga), *Clerodendrum glabrum* (uPhehlacwathi), *Spirostachys africana* (umThombothi), *Combretum erythrophyllum* (umDubu), *Buddleja saligna* (uNqandambazo), and iLulwane, isiQoqoba, and umFikijolo (scientific names unknown). *Melia azededarach* (umSelinga) was the only exotic species recorded and was not a preferred species as it is not very strong and houses had to be rebuilt more often.

Four species were reported on occasion not to be used for house construction for various reasons: *Boscia albitrunca* (umVithi) because of its medicinal properties, *Spirostachys africana* (umThombothi) for its poisonous latex, and *Acacia tortilis* (umSasane) and *Acacia karroo* (umuNga) because they were easily destroyed by termites. The avoidance of the latter two species is not necessarily in conflict with their reported use in the paragraph above as people may be forced to used species for reasons other than being preferable species (discussed under "constraints").

Between the poles, laths are woven perpendicular to the wall framework. Because these sticks are woven, it is necessary for them to be flexible and therefore *Ziziphus mucronata* (umPhafa), *Olea euorpea* subsp. *africana* (umNqumo), *Diospyros lycoides* (umNqandane), *Dombeya cymosa* (iGcibo) and iKhati (scientific name unknown) were reported to be selected.

Two species were reported to be used for the building of door frames. These were uGodide and umQathonga, their scientific names not being known. It was also reported that *Acacia caffra* (umTholo) and *Acacia karroo* (umuNga) bark were used as rope for binding building materials together before the use of nails.

Gum and wattle were reported to be used by all interviewees for the construction of the roof pole framework. Indigenous trees were said not to be used as they do not produce poles of a suitable length to height ratio i.e. poles that are suitable in length are too thick in circumference. These wattle and gum poles were bought from Mooiriver, Muden, and Greytown. One woman said that if there was no money for wattle poles, then *Vepris lanceolata* (uMozane) and *Acacia nilotica* (iSanqawe) were used as substitutes. As mentioned previously, some houses had corrugated iron roofs. This building material was said to be preferable to wood-and-thatch roofs but was considered prohibitively expensive.

8.2.3 Quantities of wood used in hut construction

It was extremely difficult to ascertain the quantities of wood required for building houses. This was for two reasons. Firstly, access to people's houses was difficult as residents were suspicious of outsiders asking questions about wood use. It was also not considered appropriate to enter homesteads when only women were present and many farm residents were interviewed where they were working and not at their houses. This prevented measurements (quantity and size) of poles and laths used. Secondly, people had difficulty in recalling exactly how many poles were used per house (a range was given) and especially how often a house was rebuilt or a new house was required. This was also due to the fact that these estimates varied widely according to household size, style of builder and termite resistance properties of the wood used.

The number of poles cut from indigenous trees and used to build a framework for the walls was said to depend on the size of the building, the builder, and the spacing between poles. Estimates of the number of poles used for the wall framework varied between 20 and 100, with 30 estimated for a small house, and 60-80 if the poles were spaced close together. It was

said that one or two poles can be harvested from a single tree depending on its size. Branches were used if the trees were large enough, otherwise small trees were cut at the base of their stems.

The number of poles used for the roof framework ranged from 15 to 30 and was said to depend on the amount of money available and the size of the house. As few as 6 poles was estimated by one group of people for a small house.

Farm residents were also asked about the number of houses within a homestead. The number ranged from 3 to 14, but most people said that there were 6 or 7 buildings in their homesteads. The number was said to depend on family size and the number of wives. It was also reported that a house generally lasted 10 to 15 years, and that it was sometimes possible to use the old poles for rebuilding. However, where termites were a problem, it was necessary to rebuild more often, i.e. after 5 to 8 years. Termites were widely reported to present a serious problem not only for pole deterioration but particularly for thatching on the roof. The infestation of termites was said to depend on the rainfall. Only one resident interviewed used chemicals to control this problem.

8.2.4 Constraints

The constraints of accessing wood for construction are reported as perceived by the farm residents. The regulations perceived by the sample of people interviewed may differ to what the farmers believe they have set. Farm residents' perceptions of regulations set by the landowner on the harvesting of trees for house construction varied from free access to very stringent controls. Generally it was found that on farms where many families resided i.e. more than 6 or 7, residents were restricted to certain species such as *Acacia nilotica* (iSanqawe), *Vepris lanceolata* (uMozane), and *Olea europea* subsp. *africana* (umNqumo) or as on one farm, no harvesting at all. *Vitex rehmannii* (umLuthu) was a species that farmers specifically wanted avoided. It was also found that farmers generally preferred residents to use only thorn trees and on certain farms, only branches were allowed to be harvested for poles. One farmer required that residents request permission first, and once granted, there was no limit to the number of poles of *Acacia nilotica* (iSanqawe) harvested. This is consistent with the thinking

that this particular species causes bush encroachment. However, on one farm, residents were not even allowed to use this species even though the residents perceived that they were abundant. The residents felt the reason for this was that the neighbouring farmer would think that they had taken it from his land. As a result residents on this farm were restricted in harvesting *Combretum erythrophyllum* (umDubu) which was in short supply and *Melia azedarach* (umSelinga) which was considered to be a poor quality building material.

A group of women on one farm said that the men were complaining about the restriction on building houses and accessing the materials. They were also complaining that regulations were not constant, and certain families were favoured and allowed more wood. The women felt that the reason the farmer did not want the men interviewed for this project was because he knew the men would voice their complaints. On another farm, residents were restricted to a certain portion of the farm, but they felt that there was not enough wood in this allocated area. One woman was arrested for cutting wood for house construction on a portion of the farm that had not been allocated. Another constraint was the inconsistency in regulations, especially on farms where both farmers and their sons, or farmers and their managers gave orders which were often contradictory. Residents said they were often confused as to what they were and were not allowed to do.

8.2.5 Perceptions of resource availability

It was reported on some farms that there was plenty of *Vepris lanceolata* (uMozane), *Ziziphus mucronata* (umPhafa), *Dombeya cymosa* (iGcibo), *Grewia occidentalis* (iKlolo), and *Acacia nilotica* (iSanqawe) while on other farms there was thought to be an inadequate supply of species such as *Acacia caffra* (umTholo), *Acacia nilotica* (iSanqawe), *Acacia tortilis* (umSasane), *Acacia karroo* (umuNga), *Spirostachys africana* (umThombothi) and *Olea europea* subsp. *africana* (umNqumo). In the latter situation residents harvested illegally from neighbouring farms. Even on farms where this shortage was reported, residents believed that there were large numbers of seedlings of these species. The shortage of wood for house construction was perceived to be a result of the many families living on the land and all requiring poles.

Only a few members of neighbouring communities were interviewed about the availability of suitable trees for poles. In some communal areas it was reported that there were no poles for hut building as trees were normally cut down for firewood before they reach the required size. In another neighbouring community one member reported that he stole wood for building from privately owned land within the TBR.

8.2.6 Economic value

There was no payment reported for indigenous trees harvested for poles for building except on one farm where harvesting is not allowed and poles are bought from residents on other farms at R2.50 a pole. Assuming this to be market value, and based on the estimates of the number of poles of indigenous wood required (20-100), the wooden wall framework per house is worth between R50 and R250. Some residents said they would prefer to build the walls out of blocks but these were prohibitively expensive.

It was reported that the cost of a wattle pole varies from R7 to R12, excluding transport costs. Based on the estimates of the number of wattle poles required (15-30), the wooden roof framework costs a household between R105 and R360 to construct. As already mentioned, indigenous species such as *Vepris lanceolata* (uMozane) and *Acacia nilotica* (iSanqawe) were used for the roof as substitutes if finances were not available. Corrugated iron, although a preferred roof material, was considered too expensive as a substitute at R34 per sheet. It was not ascertained how many sheets were required for a single home.

The market value of thatch per bundle was said to be approximately R5 and about 40 bundles are required per house, valuing the thatching per house at R200. Including the wooden frameworks and thatching of a house, and excluding the filling materials such as mud, nails and other miscellaneous items, labour and transport required to access building materials, the value of the type of house prevalent within the TBR is approximately R355 to R810.

8.2.7 Estimating the quantity of wood used for construction

Although the quantity of wood used in the construction of houses cannot be estimated directly from this study, a rough estimate could be derived using information from other studies. However, the merit of performing such extrapolations is questionable for localised management plans, and can lead to gross over-estimation or under-estimations of the quantity of wood required for house construction in a specific area. From a household survey conducted in 1994, 194 households were found to be residing on farms within the TBR (NPB, 1994a). Using an average number of houses per household of 6, the number of houses built with wooden frames from indigenous trees was approximately 1164. Best (1979) estimated that a house 9 metres in diameter, using a wood frame to hold stone slabs for the walls, required 0,419 m^3 of solid wood (about 10 bundles) while a solid wood walled house, with logs planted vertically in the ground, of the same size required 87,05 m^3 of wood. Both these estimates and house styles were based on houses at Mashunka, in the Msinga District, an area adjacent to the TBR, and are therefore thought to be similar to the type of houses constructed within the TBR. If *Acacia* spp. and *Dichrostachys cinerea* wood weighs approximately 1000kg per cubic metre (Milton and Bond, 1986), then the mass of wood required for the houses mentioned above would be 419 kg and 87 000 kg respectively. Also in Msinga, almost 3000 kg (3 cubic metres) of wood (*Acacia* spp and *Dichrostachys cinerea*) was estimated per hut which was valued at R180 excluding transport (Milton and Bond, 1986). In the Eastern Transvaal it was found that a considerable quantity of indigenous wood was found to be standing in buildings, with average masses of 4193 kg to 5091kg in households in various settlements (Griffin et al. 1992). Milton and Bond (1986) also estimated that a family of six owning two dwellings, rebuilding them at 15 yearly intervals, would require 400kg of wood per year for construction purposes which they valued at R24 per year per family.

From the above values, there appears to be two orders of magnitude with regard to the quantity of wood required for construction purposes. Without more detailed information from the study area itself, estimating from other studies is probably of little significance. Even if one were to have accurate information as to the demand for indigenous trees for construction materials, there still remains the problem of relating this demand to the resource base available. Availability in its simplest terms is the size and distribution of the resource base.

Attempts have been made in other studies to quantify the amount of wood available for construction materials (Cleminson, 1993; Griffin *et al.*, 1992, Muir, 1990). Mathematical models have also been employed to predict the relationship between supply and demand for future periods with varying measures of sustainability of the resource base (Cleminson, 1993).

8.2.8 Future arrangements

There is a high demand for indigenous trees for construction materials as they are considered to be the cheapest option, and relatively easily accessible. In neighbouring communities such as Cornfields, where indigenous trees have been overexploited, building materials have been the single most-mentioned source of financial stress (AFRA, 1991). It was also found in another neighbouring area, that of Msinga, where *Dichrostachys cinerea* and *Acacia tortilis* had become scarce, many families had to build their houses with corrugated iron and plantation-grown wattle (Milton and Bond, 1986) which are far more expensive construction materials.

Due to the great demand for building materials in the area both by farm residents and members of neighbouring communities, it is considered impossible to supply all these needs. However, it is probable that improved access to indigenous trees for construction materials could be achieved, especially if the control of bush encroachment is taken into account. Generally, farmers impose fewer restrictions on the harvesting of wood for house construction on farms where there are fewer families living, compared to farms where there are many people residing. Furthermore, access may be improved if the TBR members viewed their properties and associated resources as one functioning conservation area and a continuum of commonly owned natural resources, and developed an holistic approach to resource management. However, information concerning the availability, distribution and productivity of the resource base is first required, and is being assessed by an ecological survey.

Residents who did not have access to suitable building materials at the time of the study, expressed the desire to be allowed access to *Dombeya cymosa* (iGcibo), *Vepris lanceolata* (uMozane), *Acacia nilotica* (iSanqawe), and *Vitex rehmannii* (umDuli) for poles for building. *Acacia nilotica* (iSanqawe), a favoured construction material, particularly should be allowed to

be harvested much more freely on certain farms as it is one of the species involved in bush encroachment.

8.3 Firewood consumption

8.3.1 Introduction

Women were found to collect firewood in Weenen (see Plate 8.2) although both men and women knew of the traditional lores surrounding the use of wood for fuel. Generally dead wood was collected but where there was a shortage, people harvested live trees. It was extremely difficult to ascertain the amount of wood harvested for fuel as it varied according to household size, seasons, and the number of special occasions held. Wood is often collected and stored in piles at the homestead (see Plate 8.3). Also, a young woman has to accumulate a large pile of firewood as part of her dowry. It was not one of the project's objectives to quantify the amount of fuelwood consumed, but rather to ascertain which species are favoured, used, or avoided, perceptions of availability, and identify potential competition with other uses of indigenous trees such as woodcarving, house construction, medicine and food.

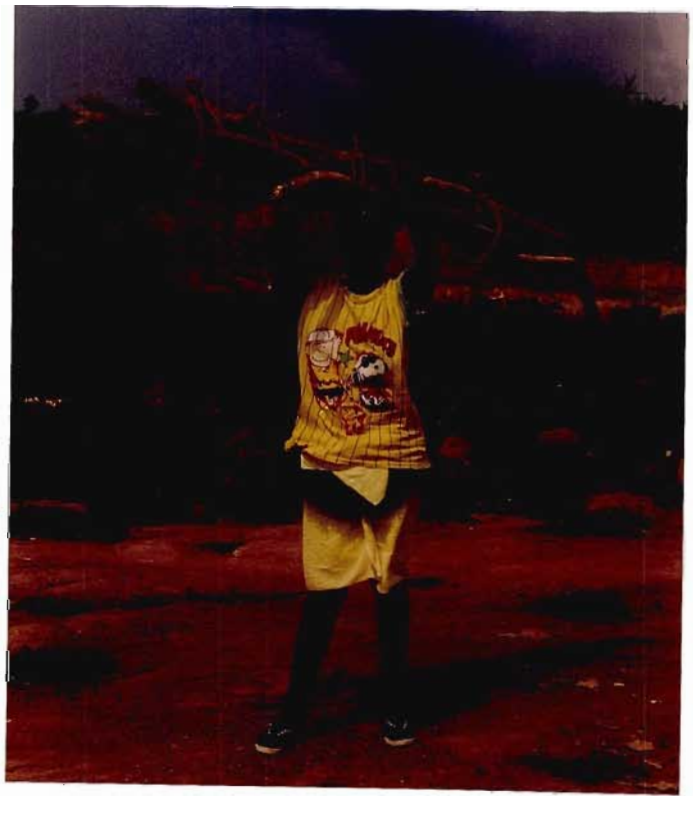

Plate 8.2 A young woman carrying a bundle of wood to her homestead.

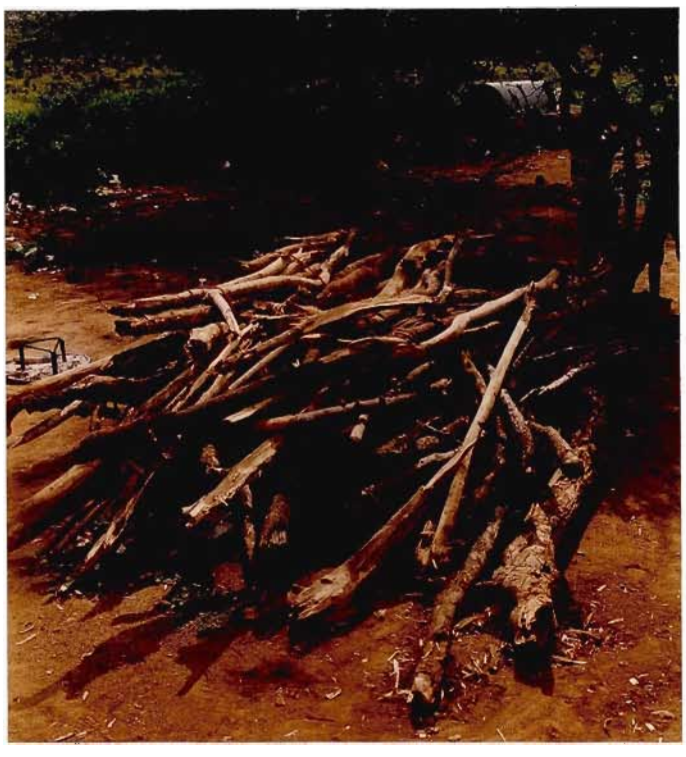

Plate 8.3 A typical wood pile kept at a homestead.

8.3.2 Species used for firewood

It was generally reported that only dead wood was used for fuel. However, in areas where there was insufficient dead wood, live trees were harvested. Most species were considered suitable for firewood but varied in their ability to produce good coals and smokeless fires, and their availability. Species are categorised as being preferred (good as a source of fuel), simply being used (available but not a particularly good source of fuel), or being avoided for various reasons. In total, 36 species are accounted for. However, the list presented in Table 8.3 is not exhaustive.

Certain species were used for special occasions such as *Ptaeroxylon obliquum* (umThathi) and *Ziziphus mucronata* (umPhafa). The latter was not used for daily cooking in the house, but used outside when cooking Zulu beer for feasts or special occasions. *Clerodendrum glabrum* (uPhehlacwathi) was previously used to start fires before the advent of matches.

Euclea schimperi (iDungamuzi) was not used for firewood as it was believed to cause separation within families. The Zulu word "iDungamuzi" literally means to split the household. The avoidance of this species was reported by all people interviewed and the origins of this

Popular species			Species used			Species not used		
Scientific names	**Zulu names**	**No.**	**Scientific names**	**Zulu names**	**No.**	**Scientific names**	**Zulu names**	**No.**
Combretum apiculatum	umBondwe-omnyama	1	*Acacia caffra*	umTholo	1	*Acacia robusta*	umNgamanzi	1
Schotia brachypetala	umGxamu	2	*Acacia karroo*	umuNga	2	*Acacia sieberana*	umKhamba	1
Vitex rehmannii	umDuli/umLuthu	3	*Acacia nilotica*	iSanqawe	3	*Combretum erythrophyllum*	umDubu	1
Tarchonanthus camphoratus ?	iGqeba-elimlophe	1	*Acacia robusta*		1	*Diospyros lycoides?*	umNqandane	1
			Acacia tortilis	umSasane	4	*Euclea schimperi*	iDungamuzi	7
			Berchemia zeyheri	umNcaka	1	*Ozoroa paniculosa*	isiFuce/isiFice	1
			Buddleja saligna	uNqandambazo	1	*Pappea capensis*	umVuma	1
			Cassine transvaalensis	umGugudu/ iNgwavuma	1	*Rhus rehmanniana*	iNhlokoshiyane	1
			Coddia rudis	isiGugwane	1	*Scolopia zeyheri*	iChichamhlolo	1
			Dichrostachys cinerea	umGagne	3	*Spirostachys africana*	umThomboti	4
			Diospyros lycoides ?	umNqandane	1	*Ziziphus mucronata*	umPhafa/ umLahlankosi	8
			Ehretia rigida	umHlele/umKlele	1	*?*	uGodide	1
			Euclea crispa	umGcalanci	1	*?*	umQathonga	1
			Grewia occidentalis	iNhlolo/iKlolo	1			
			Hippobromus pauciflorus	uThiye/uThiya	1			
			Maytenus heterophyllum	isiBhubhu	1			
			Olea europea subsp. africana	umNqumo	1			
			Zanthoxylum capense	umNgumabele	1			
			?	iGqeba	1			
			?	iKhati	1			
			?	isiQoqoba	1			

Table 8.3 Indigenous tree species that are either popular, merely used, or avoided for firewood. The number of occasions on which a particular species was mentioned is recorded provided in the table.

taboo are not known. Another species commonly avoided for fuel was *Ziziphus mucronata* (umPhafa) as it was reserved for the burying of amakhosi ("chiefs"), fencing graves, and to carry the spirit of a dead person. *Scolopia zeyheri* (iChichamhlolo) was also mentioned not to be used for firewood, but reasons for this avoidance are not known. *Diospyros lycoides* (umNqandane) was reported not to be used for firewood because of its medicinal properties. *Acacia robusta* (umNgamanzi) was said to be avoided because it is thought to bring bad luck to twins. The other species mentioned were *Acacia sieberana* (umKhamba) and *Combretum erythrophyllum* (umDubu) the smoke of which burns the eyes, and *Spirostachys africana* (umThombothi) which has a poisonous latex and produces smoke which is toxic.

8.3.3 Economic value

Farm residents did not purchase firewood from the farmer. Some farmers, none of whom were members of the TBR, allowed harvesting of firewood in great quantities on their properties as a means of controlling bush encroachment. The arrangement with one of these farmers was that local people harvested the trees themselves but then were charged R80 transport costs for a tractor load of wood to their homesteads. They were not allowed to transport this wood in their own or hired vehicles. The NPB estimated that the 22 tons of wood, that was removed from the Weenen Nature Reserve in 1994/1995, and provided to local communities, was worth R2 200 i.e. R100 per ton (NPB, 1995).

8.3.4 TBR members

Regulations set by farmers generally allowed for the collection of any dead wood and prohibited the harvesting of live trees. Bush clearing of *Dichrostachys cinerea* has been ongoing in certain parts of the Weenen Nature Reserve, and it also serves as a neighbour relations exercise. This activity was reported to be continuing during 1995/96 (NPB, 1995).

8.3.5 Future arrangements

It would appear that as for construction materials, availability of firewood is negatively correlated to the number of people using the same resource. On farms were there were only a few families residing, firewood was said to be plentiful, but on farms with many families i.e. greater than 6 or 7, finding sufficient firewood was reported to be a problem. People residing in neighbouring communities, especially in Tugela Estates and the rest of Msinga, reported that firewood on communal land was virtually non-existent. These people either purchased wood or stole it from privately-owned land. The choice of indigenous wood as a preferred source of fuel is not likely to change. The perception that wood is a good fuel is probably grounded in the fact that it is cheap and readily available, that it is the habit of the people to use wood, and that it suits the type of food cooked and the manner in which the food is cooked.

No estimates of firewood consumption can be made from the information collected in this study. Firewood consumption as already mentioned varies between households and using estimates from other studies in other areas or in the past may result in gross over- or under-estimations. Whatever the true estimates of consumption are in the area, the fact remains that on certain farms, and particularly in the case of neighbouring communities, accessing sufficient firewood is extremely difficult and is collected at great cost or risk.

Based on the large number of people living on the borders of the TBR, reported scarcity of firewood and difficulties regarding its access in the area, it is debatable whether the requirements for firewood can be sustainably achieved by the resources within the TBR. However, through the clearing of bush encroached areas, supply of firewood may be dramatically increased, especially to farm residents who were experiencing difficulty in this regard at the time of the study. This bush clearing will at the same time benefit landowners by opening up new grazing areas.

8.4 Medicinal use

8.4.1 Introduction

The study of tree use for medicinal purposes is a very large undertaking on its own and is well beyond the scope of this study. Nevertheless, questions surrounding medicinal use of trees in this study focused on those species used for woodcarving, trees commonly used by residents for treating common ailments, and tree species that specialist healers have difficulty in finding.

8.4.2 Species used

The species that were recorded to be used for medicinal purposes are listed in Table 8.4, together with a description of the part of the tree used and the reason for use.

8.4.3 Constraints and perceptions of availability

Residents who had a general knowledge of plants to enable them to treat common ailments did not report that species for these treatments were scarce. However, there were indigenous trees used by specialist healers that had been available in the past, but were reported to be very difficult to find. Many medicinal plants were collected illegally from privately-owned farms and their exact location was well known to these specialists. Some of the species that were reported to be scarce at the time of the study are denoted by an asterix (*) in Table 8.4.

8.4.5 Economic value

Economic value of indigenous trees for medicinal purposes was not determined, but is nevertheless thought to contribute significantly to the well-being of residents. In 1991 , a study conducted in Cornfields revealed that almost 60% of the residents interviewed gathered plants or plant materials for medicinal uses (AFRA, 1991). The quantities used or economic benefits were also not determined in AFRA's (1991) study. However, specialist healers

Scientific name	Zulu name	No.	Part of tree	Use
Acacia caffra	umTholo	3	Bark and roots	Induce vomiting (3)
Acacia nilotica	iSanqawe	1	Bark (boiled)	Treat chest problems (1)
Acacia sieberana	umKhamba	1	Bark	Get rid of bile (1); disputed by others
Acocanthera oppositifolia	inHlunganyemba	1	Roots and bark (mixed &ground)	Form syrup to treat headaches & snakebites (1)
Berchemia zeyheri	umNcaka	3	Bark	Induce vomiting (3)
Cassine transvaalensis	umGugudu; iNgwavuma	1	?	Enema and to induce vomiting (1)
Clerodendrum glabrum	uPhehlacwathi	1	?	Treat small goats for worms (not humans) (1)
Coddia rudis	isiGugwane	1	Roots	Induce vomiting (1)
Dichrostachys cinerea	uGagane	1	Roots (boiled)	Applied with a cloth to treat sore feet (1)
Diospyros lycoides	umNqandane	1	Sticks	prevent evil spirits and storms (1)
Euclea crispa	umGcalaci	1	Roots	Treat toothache (1)
Euclea schimperi	iDungamuzi	1	?	Sprinkling to ward away evil spirits (1)
Grewia occidentalis	iNholo;iKlolo	1	Roots	Clean the blood (1)
Hippobromus pauciflorus	uThiya	2	Roots	Induce vomiting for luck (2)
Olea europea subsp. *africana*	umNqumo	1	?	Induce vomiting (1)
Ozoroa paniculosa	isiFuce	1	?	Used as an enema and to induce vomiting (1)
Pappea capensis	umVuma	2	Bark	Used to induce vomiting (2)
Ptaeroxylon obliquum	umThathi	2	Roots and bark	Used to induce vomiting to call ancestors back (1) Used as incense (strong smell) (1)
Schotia brachypetala	umGxamu	6	Bark	Enemas (2) and to induce vomiting (4)
Scolopia zeyheri	iChichamhlolo	1	Roots and sticks (boiled)	Sprinkling (1)
Tarchonanthus camphoratus?	iGqeba-elimlophe	1	Roots and sticks	Induce vomiting (1)
Vepris lanceolata	uMozane	1	? Leaves	Induce vomiting to clean the blood (1) Fetch and call one that has died (1)
Vitex rehmannii	umLuthu; umDuli	2	? Bark/roots	Used as an enema (1) Sprinkling (1)
Ziziphus mucronata	umPhafa; umLahlankosi	1	Roots and bark	Induce vomiting (1)
?	uGuguwezinhlanya	1	Mixture of roots, stem and bark	Cure madness (1)
Encephalartos sp.	isiGqiki-somkhovu	1	Root, stem and bark	Sprinkled to prevent evil spirits (1)
?	amaHlungangwane	1	Roots and sticks	Treat yellow eyes (jaundice) & bone diseases(1)
?	umGwonyanfengane	1	Bark and roots	Steaming or to induce vomiting for luck (1)
?	oMayime	1	Roots, sticks and leaves	Sprinkled to prevent evil spirits (1)

Table 8.4 A preliminary list of indigenous trees used for medicinal purposes in the Weenen area. The numbers of times a particular use was reported is recorded in the table.

reported that the income derived from their practice was insufficient to support them and their families.

8.4.6 Conservation ethics

The specialist healers were found to be very conscious of preserving the resource base on which their livelihood depends. Trees that had been ring-barked were noted on farms, and the reason for this activity is not known. Either bark was taken for medicinal use or the perpetrator acted on purpose to kill the tree, perhaps relinquishing it for firewood.

8.4.7 Traditional knowledge

People, especially those who knew and used indigenous plants, were very knowledgeable about their healing powers as well as the biology and ecology of these species. Much of this knowledge is unrecorded. Fortunately in the study area, this information is being passed on to the younger generation.

8.4.8 Farmers' attitudes

Farmers generally have a negative attitude towards the use of trees for medicinal purposes as they report seeing many ring-barked trees which they attribute to nyangas. The nyangas spoken to were adamant that they never ring-barked trees as they were aware of the damage it causes. One man reported that it was people who were not trained how to harvest properly that were causing all this damage. Some of the specialist healers said that they had on previous occasions approached the farmer to request permission to harvest certain plants for medicinal use, but that these requests had always been refused.

8.4.9 Future arrangements

It is not thought that the use of trees used to treat common ailments by residents has a significant impact on the resource base, unless these residents were ring-barking trees for this

purpose. It is also thought that the specialist healers are not having a detrimental affect on indigenous trees as they are specifically trained to conserve their resource base. They are also very knowledgeable about the biology and ecology of these species. It is therefore suggested that the TBR enter into a partnership with these healers to provide them with medicinal plants from the wild, and perhaps even through cultivation in return for valuable knowledge and the training of other people as to the importance and methods of conserving indigenous plants.

The ground work for this partnership has already been initiated, in the form of a preliminary report on the plant resource needs of traditional healers from the Weenen area (McKean, 1994). Fifteen of these specialist plant users walked transects through the Weenen Nature Reserve collecting specimens of species that they would like to harvest which totalled 36 plant species, of which 10 were tree species. Recommendations resulting from this survey included prioritising this list, estimating abundance and distribution of these priority species, and promoting the establishment of nurseries to cultivate some of these species (McKean, 1994).

8.5 Edible fruit harvested

8.5.1 Introduction

Fruit of indigenous trees did not appear to play a large role in the diet of local people in Weenen because it was not always available, especially during periods of drought. It was reported to be eaten merely because it tasted pleasurable.

8.5.2 Species used

There were 16 species of trees reported to be utilised for their fruit. Three indigenous tree species were particularly valued, namely *Berchemia zeyheri* (umNcaka), *Harpephyllum caffrum* (umGwenya) and *Vitellaropsis dispar* (umPhumbulu). Species reported on three occasions as significant in terms of the fruit they produce were *Cassine traansvaalensis* (umGugudu), *Euclea crispa* (umGcalanci) and *Pappea capensis* (umVuma). Fruit of species that were reported only once or twice to be eaten were *Acokanthera oppositifolia* (inHlunganyemba), *Boscia albitrunca* (umVithi), *Diospyros lycoides* (umNqandane), *Ehretia*

rigida (umKlele), *Grewia occidentalis* (iKlolo), *Olea europea* subsp. *africana* (umNqumo), *Rhus rehmanniana* (iNhlokoshiyane), *Ziziphus mucronata* (umPhafa), and umQathonga (scientific name unknown). These species were reported to produce fruit mainly in the summer.

It was reported by most people interviewed that the only fruits available in any significant quantity at the time the study was conducted, were the fruits (amaDolofiya) of the wild cactus, *Opuntia* sp. (isiPhapha). The indigenous species had not borne well for several years and the reason given was the drought. Nectar of *Schotia brachypetala* was also reported to be consumed for its sweet taste.

People interviewed also provided a few names of species that were consumed by animals. This information was not specifically asked for but was recorded when given. The list, although superficial, is presented in Table 8.5, and gives an indication of the in-depth knowledge and acute observations made by local people. For example, it had been observed that the gum of *Ozoroa paniculosa* is collected by bees. The pods of the *Acacia* species listed are also worth special mention as they are an important food source for both livestock and wild game. Although many of the fruits reportedly eaten by people were not specifically reported to be eaten by animals in this study, they are reported elsewhere to be consumed by animals (Pooley, 1994).

8.5.3 Use of fruit elsewhere in the province

In a study conducted in 1991 in Cornfields, it was found that just over 40% of the residents interviewed gathered wild fruits, but the actual importance to their diet, nutrition or economic benefits were not determined (AFRA, 1991). As already reported, edible fruit of indigenous trees by local people in the Weenen area appears to be of little nutritional value and plays an insignificant role in the people's diet because it is not readily available. This is unlike studies in other communities. For instance, in Maputaland, northern KwaZulu-Natal, fruits from 76 species were known to be eaten, providing vitamins deficient in the staple starchy foods, as well as offering economic benefits in the sale of wine produced from the fruits of some of the species (Cunningham, 1985).

Scientific name	Zulu name	Human consumption	Animal consumption
Acacia nilotica	iSanqawe		Pods eaten by goats and cattle.
Acacia robusta	umNgamanzi		Pods and leaves eaten by cattle, goats and buck.
Acacia tortilis	umSasane		Leaves and pods eaten by goats and buck
Acocanthera oppositifolia	inHlunganyemba	Fruit (1)	
Berchemia zeyheri	umNcaka	Fruit (12)	
Boscia albitrunca	umVithi	Fruit (1)	
Cassine traansvaalensis	umGugudu	Fruit (3)	
Diospyros lycoides	umNqandane	Fruit (1)	
Ehretia rigida	umKlele	Red fruit (1)	
Euclea crispa	umGcalanci	Fruit (3)	
Grewia occidentalis	iKlolo	Fruit (1)	
Harpephyllum caffrum	umGwenya	Fruit (9)	
Olea europea subsp. *africana*	umNqumo	Fruit (1)	
Opuntia sp.	IsiPhapha (amaDolofiya)	Fruit (12)	
Ozoroa paniculosa	isiFuce		Gum taken by bees
Pappea capensis	umVuma	Fruit (3)	
Rhus rehmanniana	iNhlokoshiyane	Small red fruit (2)	Small red berries eaten by birds
Schotia brachypetala	umGxamu	Nectar (2)	
Spirostachys africana	umThombothi		Seeds eaten by duiker in winter (farmer)
Vitellaropsis dispar	umPhumbulu	Fruit(9)	
Ziziphus mucronata	umPhafa	Fruit (1)	
Scientific name unknown	isiQoqoba	Not eaten by people	Fruit eaten by birds
Scientific name unknown	umQathonga	Fruit (1	

Table 8.5 A list of indigenous tree species and their products that are eaten by humans, livestock, and wild animals.

8.6 Other uses

There were other uses of indigenous trees recorded such as for fencing, tool handles, and oxen yokes. Much of the fencing at homesteads had been erected many years previously, and the women interviewed at their homes could not recall the species used. Many farm residents had no current need for fencing materials as they were no longer allowed to keep livestock, or the numbers were limited and the animals kept away from the homesteads. Similarly, in most cases the farmers and the drought prevented cultivation. Thus, no cultivated fields were noted and the need for indigenous trees to make oxen yokes is perhaps a thing of the past. The use of iGqeba (scientific name unknown) leaves to make a head-dress for married women was also reported to be historical. If these are dying traditions, then it is important to document them before the information is lost. These uses are therefore provided in Table 8.6.

Scientific name	Zulu name	Use
Acacia karroo (1)	umuNga	Oxen yokes (1)
Acacia nilotica (1)	iSanqawe	Oxen yokes (1)
Acacia robusta (1)	umNgamanzi	Oxen yokes (1)
Brachylaena ilicifolia (1)	iGqeba	Previously used to make a "crown" to decorate married women (1).
Dichrostachys cinerea (1)	uGagane	Hammer handles (1) "Droppers" in fencing (1)
Ptaeroxylon obliquum (1)	umThathe	Axe handles

Table 8.6 Various uses of indigenous wood in the Weenen area.

Women interviewed who made beer strainers and mats out of grass and reeds all reported that they used commercial dyes and not natural dyes obtained from plants in the present study area. So, unlike other areas where the harvesting of roots and other plant organs presents a problem in the sustainable utilisation for trees, this is not thought to be a problem in the present study area. Based on findings of other studies, species that have the potential to be used as a source of dye elsewhere, found in the study area, are listed in Table 8.7.

Species	Part of plant used	Colour	General information	Source
Acacia siberiana	bark	grey	Especially satisfactory and used for any material	Grossert (1953)
Aloe marlothii	roots	golden-yellow	Roots boiled with weaving material.	Cunningham (1987)
Clerodendron glabrum	fruit	blue-grey	Poor quality dye. Seldom used. Not colour fast, large quantity of fruit needed.	Cunningham (1987)
Combretum molle	roots	yellow-brown	Seldom used.	Cunningham (1987)
Idungamuzi	leaves roots-outer layer	reddish-brown black/dark-brown	Especially satisfactory and used for any material	Grossert (1953)
Rhus rehmanniana inhlokoshiyane	bark	reddish-brown	Especially satisfactory and used for any material	Grossert (1953)
Schotia brachypetala	bark	red-brown	Bark beaten then boiled. Estimated 1 kg bark per kg weaving material.	Cunningham (1987)
Wattle	bark	light brown	Especially satisfactory and used for any material	Grossert (1953)
Zanthoxylum capense	roots	light yellow	Seldom used.	Cunningham (1987)

Table 8.7 Tree species that are found in the Weenen area and reported to be used for dyes in other studies.

8.7 Summary and general recommendations

It was apparent from this preliminary assessment that the local people in the Weenen area depend on indigenous trees extensively, especially for fuel and for construction materials. Indigenous trees as a source of medicine is also important, although more information for this use is required. There appeared to be many specialist traditional healers in the area, and most people had a general knowledge about medicinal values of trees for treating common ailments. The fruit of indigenous trees was not found to be an important source of human nutrition in the area, especially as it is scarce during frequent periods of drought. However, the fruit of *Opuntia* sp. which is abundant even in the dry years, is consumed in large quantities by many local people, and may be an important source of nutrition. Any attempts to eradicate this alien should bear the significance of this species in mind.

Controlling bush encroachment may be a partial solution for improving access of wood for fuel and construction materials, at least for farm residents living within the boundaries of the TBR. This suggestion requires further research and the extent of bush encroachment in the area needs to be established. Some of this information may be obtainable from the ecological study that was conducted in conjunction with this study. Partnerships with specialist healers may also aid in improving access to trees of medicinal value and their extensive knowledge may be used for management and monitoring.

Although the various uses have been discussed in relative isolation to each other, it must be recognised that these uses overlap and impact on a common resource base. The potential for competition between users and uses therefore exists, and any future research or management plan must take this interaction into account. Chapter 9 thus attempts to draw together the findings from this chapter, with the findings presented in the chapter on woodcarving, and the general social dynamics operating in the area, and provide recommendations for future efforts towards the sustainable utilisation of indigenous trees within the TBR.

CHAPTER 9

TOWARDS THE SUSTAINABLE UTILISATION OF NATURAL RESOURCES

9.1 Introduction

This thesis has attempted to cover many disciplines, principles and concepts, and link them together within the theme of sustainable resource utilisation. In order to explore the complexity of the relationships inherent in resource management within the constraints of this thesis, it has been necessary to sacrifice depth of the subject matter for a more holistic perspective. The emphasis of this chapter is thus on the importance of an holistic approach to research necessary for sustainable resource management, which includes not only ecological principles, but interacting social and economic dynamics as well.

The aim of this study was to elicit information on the use of indigenous trees by local communities and to provide recommendations based on this information to form the basis of a management plan. Various constraints were found inherent to both these phases of the study, and were a function of both project design and external conditions inherent to the study area, as well as the nature of this type of research.

9.2 General characteristics of and constraints inherent to natural resource use studies

9.2.1 The problem of defining sustainability

In order to formulate a management plan involving the sustainable use of natural resources, it is necessary to first define "sustainability". Few would question the concept of sustainable

development as it encompasses the very rational notion of utilising resources within the earth's capacity to meet those needs, as well as the very noble notion of caring for the earth for the benefit of present and future generations. However, because the concept is so broad, and simultaneously embraces broad ecological, social and economic principles, it is open to wide-ranging and often conflicting interpretations. This leads to the problem of how one assesses whether a natural resource is being managed sustainably or not. Another problem is the differing emphasis that is placed on ecological, social and economic aspects by various interest groups, as the goals of all three cannot be simultaneously maximised, and compromises are necessary. The degree to which comprises can be made without jeopardising the integrity of an ecosystem or resource base, or neglecting to provide for people's basic needs, is not a simple matter to determine. Thus the concept of sustainability itself is probably unattainable, and management plans should rather be focused "towards sustainability" or the "wise" use of natural resources.

9.2.2 Estimating demand for a particular resource

Assessing the demand for a particular source should not only focus on the quantities of the resource required, species and size class favoured, but should also include other selection criteria based on cultural and economic affiliations. Furthermore, demand may result from more than one form of use, and these uses may compete for the same resource. The social dynamics operating around resource utilisation may be extremely complex and have deep ramifications on resource use. Also, demand for a resource may constantly change, and therefore needs to be monitored. To address many of these issues adequately, co-operation with resource users is required, which of necessity involves rapport building. As already stated, it was not the aim of this study to provide in-depth information on the quantities of indigenous wood consumed in the Weenen area, nor was this possible within the time available. Factors affecting demand, and constraints that local people were experiencing accessing indigenous trees have been reported in Chapters 7 and 8.

In this study, due to the need for confidentiality arising out of conflict in the area, it was not possible to accompany users into the field, especially those harvesting wood illegally. Also, many farm workers were interviewed away from their place of residence and direct

estimates of natural resources could not be made. Instead, the participants were asked to estimate wood consumption, relying often on long-term recall abilities that may not always have been accurate. Even when people were interviewed at their homesteads, it was not considered appropriate in many cases to measure woodpiles or building poles as sufficient rapport had not been established with these residents.

9.2.3 Correlating supply and demand

Difficulties also existed in correlating supply and demand, which is the core issue of a management plan. One of the aims of a component study, was to assess the size and distribution of the indigenous tree resource base within the TBR. However, farms operate fairly independently in units, and a farm resident confined to the utilisation of a particular resource on that farm is governed by regulations set by that particular farmer or TBR member. Thus even though the ecological study may show a certain species to be abundant and sustainably usable upon assessing the entire area, social interactions may prevent many of the resource users from benefiting from this information. This is also applicable to resource assessments at a larger scale, such as the biomass assessment of KwaZulu-Natal (Mander and Quinn, 1995). Similarly, Shackleton (1995) estimated that the annual national supply of fuelwood far exceeds the demand, and therefore suggests that the solution lies not in the planting of more trees, but in their redistribution. This view may be far too simplistic as it is doubtful whether the necessary resources required for this redistribution are available, or whether such a national programme could be implemented in view of the extremely complex social and political dynamics operating in various local communities in South Africa. It is therefore argued that recommendations resulting from biomass assessments cannot promote the sustainable utilisation of a resource unless they are conducted at the scale in which the resource user interacts with the biophysical and social environment, as well as constantly being monitored.

9.2.4 The need for confidentiality

There is often conflict surrounding the utilisation and management of natural resources. This was found to be especially true in the TBR where harvesting or utilising a particular resource has resulted in prosecution for trespassing, arrest for illegal harvesting or grazing, or eviction from a farm resulting in loss of employment and/or residence. In the light of this conflict, strict confidentiality was offered to participants in return for information regarding natural resource use. This confidentiality was ensured by withholding names and geographical locations of participants. Participants are referred to as residents within the TBR, or members of neighbouring communities. Because localities are therefore not provided, and levels and constraints of utilisation differ from farm to farm, recommendations cannot be made specifically to individual landowners and resource users, and out of necessity, are frustratingly vague.

9.2.5 Incorporating indigenous/traditional knowledge

As already discussed in Chapter 2, the value of indigenous knowledge has previously been dismissed, although this attitude is changing. However, it is also cautioned that the scientific approach should not be merely disregarded in the sentimental belief that all indigenous knowledge can provide the answers to resource management problems. Similarly, it should not be assumed that the practices of local people are necessarily the most informed or expedient, merely because they are familiar with their surrounding environment. Instead, both approaches need to be assessed simultaneously, and where appropriate, integrated.

In this study, it was found that the residents on both the farms and in neighbouring communities were very knowledgeable about indigenous plants and their uses. This is perhaps not surprising when one considers their dependence on these natural resources primarily for fuel, shelter, grazing, medicine and craft materials. This knowledge is also being passed on to children who were found to have no problem in identifying various species. Not only are people very knowledgeable about the names and uses of plants, but from constant observation, also have knowledge about the biology and ecology of these

species, such as the flowering and fruiting times, and interactions with animals. This source of information needs to be valued and recognised, and integrated into a management plan.

9.2.6 Addressing gender inequalities

The role of the researcher in addressing gender inequalities in resource management studies is discussed in the following chapter (Chapter 10). However, it is also considered appropriate to discuss how gender inequalities may influence the research process and impede recommendations that can be made.

Gender inequalities were particularly apparent in the Zulu communities within the study area. Some of the women were reluctant to speak to the researcher as they felt that it was not their place as women of the household to speak on behalf of the household on natural resource use. The fact that men are the head of their households is mirrored in a male-only farm workers' committee which represents the interests of the farmworkers within the TBR. Division of labour according to gender was also observed. Men were reported to be responsible for the harvesting of construction materials, building the frame of the houses, and managing livestock Although many of the women interviewed were aware of what species were needed for construction materials, and the building process in general, they were quick to point out that it was the men with whom these matters should be discussed. With regard to livestock, this division of labour was even more apparent. Women on the other hand, were responsible for harvesting thatch grass and the actual thatching of a house, cultivation where permitted, and the production of various grass and reed products such as sleeping mats and beerstrainers. Women are also responsible for the collection of firewood and water. These differences and/or inequalities need to be recognised, and addressed in the formulation of a management plan where possible.

9.2.7. Local nomenclature and terminology

Local nomenclature and classification systems may differ greatly compared to that of a scientific approach. One of the problems experienced by the researcher in this study was

matching the Zulu common names of plants with the scientific name as it was not always possible to collect voucher specimens. For example, one name that was continually a problem was iGqeba as it could refer to four different species, *Brachylaena elliptica*, *Brachylaena ilicifolia*, *Buddleja saligna*, or *Tarchonanthus camphoratus*. All these species have leaves that are relatively similar in appearance, elliptic and green above, white or greyish on the underside (Pooley, 1994 and personal observation). An extension to iGqeba is sometimes given, for example, iGqeba-elimhlophe or iGqeba-elimnyama which does aid in narrowing down the scientific names to one or two species. Several Zulu names could not be matched at all to scientific names even after consulting other ethnobotanical studies and numerous fieldguides. These were iKhati[1], isiQoqoba, uMombo, umGuguwezinhlanya, amaHlungangwane, oMayime, umGwonyamfengane, umFikijolo, and iluLwane.

9.2.8 Control and access to land and its associated natural resources

Control and access to land and associated natural resources may influence both the research phase and the implementation of a resultant management plan. In this study, the landowners who controlled access to many natural resources, were part of a biosphere reserve. However, farms are currently being managed as individual units by the respective landowners. There are attempts within the various cell blocks to co-ordinate the fencing of boundaries, hunting ventures, the stocking of game, anti-poaching units (APUs) and the introduction of infrastructure such as roads. However, it would appear from the study that there is no attempt to co-ordinate the utilisation of natural resources by farm residents and members of neighbouring communities. Farmers appear sensitive to any form of perceived interference as to how they interact with their labour force and residents living on their farms. It was suggested to a member of the research team that it was not considered etiquette to interfere with another farmer's labour and as a result the arrangement in terms of the use of natural resources is strictly between the farmer and the farm residents. Additional disparities arise within the boundaries of one farm where regulations set by the farmer differ to those set and implemented by his manager. Farm residents complained on

[1] iKhati did not refer to an *Erythrina* species.

numerous occasions that this inconsistency left them confused as to what they were and were not allowed to harvest.

The majority of the TBR members were very reluctant to share their resources with surrounding communities, and some, with the people that reside on their farms. Their arguments were that one needed only to look at the condition of neighbouring areas to see denudation of vegetation and extremely poor soil condition; many indigenous trees grow very slowly and therefore replenish at a slow rate, and they do not want people roaming around their property. Farmers also feared stock theft, ringbarking of trees, wastage of resources, and overexploitation of resources.

9.3 Recommendations for natural resource use within the TBR

9.3.1 The nature of these recommendations

Based on the information collected during this study which is presented in chapters 7 and 8, the social dynamics operating in the study area, and the characteristics and constraints inherent to research of this nature, it is possible to make certain recommendations. These recommendations are not meant to be prescriptive or an end in themselves. Their aim is to suggest direction for future research, to dispel misunderstandings that appear to be present between various interest groups, and to stimulate meaningful interaction between resource managers and resource users that might lead to substantiated management plans.

9.3.2 Constraints inherent to the TBR

The biosphere reserve in theory can promote the sustainable utilisation of resources; however, in the case of the TBR, there are many obstacles, both internal and external, preventing it from performing this function. The main constraints are land tenure uncertainties, superficial cohesion between members, lack of a jointly-agreed upon management plan, including the design of appropriate zoning, inadequate participation of local people and lack of financial resources for investment in the necessary infrastructure.

Despite these constraints, the vision to promote ecotourism within the framework of the biosphere reserve concept is probably one of the more appropriate ways of ensuring sustainable development and combating poverty in the region. This form of low impact land use is even more favourable in light of the general environmental degradation, adverse climatic conditions, and relatively low productivity in the region. However, ecotourism is a long-term goal and the problem of how to satisfy short term goals resulting from the high level of dependence of local people on natural resources remains.

9.3.3 Whose responsibility is it?

The apparent success of international biosphere reserves appears to be related to the fact that land ownership of national parks or protected areas is vested in the state, whose role is to manage the land for its citizens. This differs from the TBR where the majority of land is privately owned and less than a tenth is owned by the state. No part of the TBR is presently communally owned or managed, nor does it consist of any tribal land. Therefore, it remains unclear as to exactly who, or which organisation, should assume responsibility for meeting local communities' basic needs.

Although the TBR cannot be held responsible for the well-being of all local people in the area, because landowners derive benefits from the establishment of the TBR, sometime at the expense of local residents, it should compensate these people in some way. One of the benefits it is able to provide is allowing access to certain natural resources. However, this benefit is limited in supplying the needs of high-density populations, and state intervention and finances are required. The ideal situation would be state investment in this type of regional approach to speed up sustainable development as part of the RDP. However, it is highly unlikely, nor is it advocated that government sanction this venture in its present form while so much inequity (in terms of land ownership and thus control of resources) exists, and so many human rights violations have been reported.

9.3.4 General considerations and recommendations

Due to the sheer demand in the region, it would be impossible for the TBR to supply these required natural resources to all its neighbours and residents on a sustainable basis. However, it may be possible for the TBR to improve access to certain resources to local people residing within its borders and/or specialist resource users such as woodcarvers, traditional healers, and people who use reeds and grasses for weaving. In order to achieve this, certain partnerships meeting certain criteria would need to be formed between the landowner/resource manager and the resource user. Already existing in varying capacities, are the TBR members' committee, the farm workers' committee, and the anti-poaching unit (APU) within the TBR, as well as various community-based development committees in the neighbouring areas and loose associations of traditional healers. One of the main components lacking in these structures is the representation of women who are also very involved in natural resource use. Within these structures, and others that may need to be formed, successful management partnerships would need to integrate traditional knowledge and management systems with scientific, ecological approaches. These partnerships may not only be based on the one-way provision of natural resources, but also allow for continual monitoring of the resource base, and be used to enhance a conservation ethic through education-based programmes in the wider community.

9.3.5 Specific recommendations towards the sustainable use of indigenous trees in the TBR

Although the different uses of wood have been discussed separately in Chapters 7 and 8, their impacts are accumulative, and there is competition for the use of the resource base, especially the use of fuel and construction materials. This finding is consistent with studies elsewhere (Muir, 1990; AFRA, 1991; Griffin *et al*, 1992; James, 1992; Cleminson, 1993). For example, it was reported by local people in this study that the harvesting of wood for firewood in densely settled areas often extends to the harvesting of live trees, thus adversely affecting the availability of building materials.

Due to the sheer demand of wood for construction materials and firewood, it is unlikely that the TBR could supply wood to all these generalist resource users on an ongoing basis. However, it may be in a position to support the needs of specialist users such as woodcarvers and traditional healers. These specialists were not only found to practise traditional conservation measures, but could also contribute vastly to the formulation of natural resource management systems based on their extensive traditional knowledge.

Uncontrolled access to indigenous trees within the TBR would have disastrous results as is apparent in the neighbouring areas of Msinga and Tugela Estates where the demand far outweighs the supply. These densely settled areas are almost totally denuded of their indigenous tree resources with the result that either people steal wood from privately-owned farms, including those within the TBR, or have to substitute with other often very expensive fuel (paraffin) or building materials (plantation grown wood, corrugated iron, blocks). It is thus apparent that access to indigenous tree resources needs to be controlled. However, Muir (1990) conservatively estimated that it would cost up to four and a half times more to establish a simple but extensive management system at a particular forest reserve to ensure sustainable utilisation of trees, than the cost of establishing a woodlot of exotic trees that could replace the current wood production of the same forest reserve. He therefore suggested that woodlots be urgently established to substitute the bulk of wood harvested from indigenous forests. Muir (1990) also recognised that there are certain specialised resources that woodlots cannot supply and systems for managing extensive, low-level subsistence utilisation of forests should be urgently developed. It is also suggested that household-based wood growing should be promoted in order to provide a longer-term solution than the harvesting of slow growing indigenous species from the wild.

In terms of the TBR, there are several constraints to implementing these suggestions. Firstly, if woodlots are to be established, who would be responsible for providing the funds? Many of the TBR members are lacking in finances, especially those in the transition phase of shifting their income generation from cattle to game ranching. Additionally, Weenen has low rainfall and very cool winter temperatures, climatic conditions which do not promote a high growth rate of trees. In order to promote the long-term solution of home-based wood growing, people would require water. At present many do not have immediate access to water even for human consumption. This was found to be a valid constraint in the eastern

Transvaal, where insufficient water and problems with animals particularly goats eating the trees, were cited as problems for growing trees at homesteads (Griffin *et al*, 1992). Also, the lack of secure land tenure may discourage people from investing in this type of venture as found in Cornfields (AFRA, 1991).

Another solution may lie in the control of bush encroachment. There are a number of conservation areas that are reported to co-operate with neighbouring communities and allow the harvesting of the particular species and size classes for firewood and building materials in order to control bush encroachment. These conservation areas include Phinda Resource Reserve, Hluhluwe-Umfolozi Park and the Lower Mkuze section of the Greater St Lucia Wetlands reserve (Cleminson *et al*, 1994). Bush clearing and charcoal production is occurring on a large scale in selected areas of the Phinda Resource Reserve in an attempt to reverse encroachment. Species that are removed include primarily *Acacia burkei*, *A. nilotica*, *A. robusta*, *Strychnos madagascariensis*, *S. spinosa*, and *Terminalia sericea* (Cleminson et al, 1994).

Bush encroachment, is extremely prevalent in some areas of the TBR, especially where the *Acacia karoo-A. nilotica* Thorn Veld community is evident, and it has resulted in widespread invasion of the more open grasslands and woodlands. Extensive harvesting of *Acacia nilotica*, which is a favoured species for construction materials, and may be used for fuel, could aid in controlling bush encroachment, benefiting both the resource user and resource manager. The solution of bush clearing was also suggested for Cornfields as it was felt that the area as a whole, including farms not immediately adjacent to Cornfields, could provide ample firewood as the surrounding bushveld is rich in good fuelwood species. Listed as good fuel species were *Acacia nilotica*, *A. tortilis*, *A. karroo*, as well as other favoured species such as *Combretum erythrophyllum*, *Dichrostachys cinerea*, *Maytenus heterophylla* and *Ziziphus mucronata*[2]. It was therefore suggested that there was potential for co-operation between local farmers and the Cornfields community, by allowing firewood harvesting to act as a brake on bush encroachment, benefiting both the community and the farmers (AFRA, 1991). However, to avoid coppicing of harvested trees, and to the ensure the correct level and locality of harvesting, in-depth research is required.

[2] This species was avoided by many of the respondents in this study as it is reserved by many for burial purposes.

9.4 Conclusion

Although it is not perceived possible that the indigenous wood requirements of all local people in the area can be met by the resources within the TBR on an ongoing basis, management of bush encroachment, may increase the supply of firewood and construction materials, especially to some farm residents who were experiencing difficulty in this regard at the time of the study. Through partnerships with more specialist users of indigenous trees such as woodcarvers and traditional healers, access to these resources too may be improved. Although more detailed and participative research is needed before substantiated management plans can be formulated, it is hoped that through this study a foundation will be laid to direct future research efforts, dispel misunderstandings, and be part of the effort needed to ensure sustainable utilisation of natural resources.

CHAPTER 10

THE ROLE OF THE RESEARCHER IN RESOURCE MANAGEMENT

10.1 Introduction

The previous chapter focused on the type of data necessary for the formulation of management plans, as well as many of the constraints that may feature in the data gathering and analysing process. Furthermore, the role and ethical behaviour of the researcher[1] has great bearing on the research process and the formulation of management plans. This chapter thus focuses on how the researcher can and does influence a management plan for the sustainable utilisation of natural resources.

10.2 Interactions with resource managers and resource users

Historically, protected areas have been managed primarily for the purpose of preservation. Consequently, management systems, were based purely on ecological principles. Presently many protected areas are attempting to provide tangible benefits to local communities, and one of these benefits is controlled access to particular natural resources. As the formulation of management plans for the sustainable utilisation of natural resources additionally involves a substantial human element, it is now necessary for the researcher to interact with people as well as examine the productivity and stability of the resource base.

These "people" may be placed within two broad categories, namely, the resource user and the resource manager. These categories may be further divided into various interest groups. For example, in the case of the use of indigenous trees within the TBR, the farmers or landowners, and the NPB constitute the resource managers, while local farm residents/workers and members of neighbouring communities may be seen to be the resources users. There are marked differences between these two groups in terms of

[1] "Researcher" is interchangeable with "research team".

culture, wealth, land and natural resource ownership, farming practices and perceptions of the resource base. Marked differences exist within these two main groups too. For example, farmers differ in terms of wealth, farming practices, and expectations of and commitment to the TBR. Men appear to be the decision makers, and in most cases, women act as silent partners, at least at public meetings. The resource users may be divided into different user groups such as woodcarvers, firewood gatherers, construction material gatherers, and traditional healers. Gender differences also appear to play a major role as there is often a clear division of labour for certain tasks. For example, women collect firewood and men harvest construction materials. This scenario is further complicated if one includes traditional management systems, as the resource users may have historically acted as resource mangers. With such a diverse group of resource managers and resource users, the researcher needs to recognise the great potential for conflict of interests. The social dynamics already described in this thesis are good examples of the extent to which conflict can occur.

With such a diverse array of interest groups, it also becomes a difficult task for the researcher to remain objective with regards to the focus of the research and to devote an equal amount of research resources to the different interest groups. The researcher should avoid providing information that will empower one group at the expense of another. It can thus be an advantage to being an "outsider", as the researcher will generally have little vested interest in one particular resource group. The researcher can be therefore be more objective about bottom-line carrying capacities of the environment or a particular natural resource, and unbiased in the recommendations proposed for the allocation of a resource. However, the cultural, technological, and academic background of the researcher may inadvertently favour resource groups of similar culture, language, and gender. The researcher needs to be aware of this possibility and guard against it.

10.3 Project identification

If true participation is desired, it is necessary to ensure participation of all interest groups at all levels of a management plan. Ideally, this includes the agreement among various interest groups that there is a need for a change in the present management system, as well as

agreement on the focus of the research. Therefore, all interest groups that are potentially affected by the proposed management plan should be involved in the identification of the research project. Ideally, the study should be initiated by the participants themselves. This seldom occurs as was the case in this study, which was initiated by the NPB in apparent isolation of the other interest groups.

Although the NPB is a member of the TBR, it also has other vested interests in conservation in the region as a whole, at which level it represents the state. During the course of this study it was found that there are underlying power relations between the NPB and the other TBR members. This is a result of the dependence of TBR members on the NPB for necessary permits for the introduction of large game animals, for its extension capacity in terms of management advice and anti-poaching unit training, and for the provision of valuable animals to stock the TBR as it develops. It is thought that because the NPB initiated this study, other TBR members may have felt coerced into allowing this study to be conducted. The rationale behind this notion is the resistance offered by some of the farmers, and second-hand reports of dissatisfaction with the topic being researched. Although the *amakhosi* and/or development committees were approached for permission to conduct this study in the neighbouring communities as well, individual participants had no prior knowledge of the study. Some of the farm residents were given notice of the study by the farmers prior to the arrival of the research team, but had little understanding of what the project entailed or how it was going to affect their lives. This ignorance of the study and/or resistance to it taking place adversely affected the research process, and information was not always freely given. This lack of participation from the beginning, and resistance throughout need to be carefully considered in any management plan that may arise out of this study.

Another issue that needs to be mentioned is the research focus that was originally proposed for the study, namely woodcarving. This focus was not welcomed by farmers as they believed a new awareness of the value of hardwood species would be created that would result in unsustainable harvesting of these slow-growing trees. During the study, woodcarving was found to be of little significance to the majority of local people, with only a few people actively involved in the trade. Even when the focus was widened to include

other major uses of indigenous trees, local people continually stressed other issues such as dissatisfaction with the number of cattle and goats they were allowed to keep on the farms, inaccessibility of potable water, disallowance to cultivate, and great distances from and inadequacies of schooling. The research process used in this study was almost entirely extractive and it is suggested that any subsequent research should be of a more participative nature, with greater participation at the level of project identification.

10.4 Organisational alliance

The researcher also needs to be aware of the effect that alliance with one particular group may have on another group. During the study, it was found that certain farm residents were hesitant to provide the researcher with certain information as they perceived the research team to be conducting the research for the benefit of farmers. It was generally found however, that in the light of all the social conflict in the area, alliance to the NPB was probably most appropriate as both the farmers, farm residents and members of neighbouring communities had a neutral, if not favourable relationship with the NPB in this particular area.

10.5 Selection of methodology

The selection of a research methodology that is sufficiently flexible and participative is very important in formulating resource management plans. RRA, as discussed in the Chapter 3, was used as the methodological framework for this study although PRA is thought to be an even more appropriate tool in analysing the management of natural resources, as it centres around the principle of participation and the fact that rural communities are equal partners in the planning process (Wild, 1994). However, PRA has been known to raise expectations (Edwards, 1995) and it is therefore necessary for the researcher to be very clear to the participants in what the study can and cannot deliver. In the case of this study, the researcher could not promise delivery of natural resources within the TBR. It is thought that if a researcher has tangible benefits to offer a community, such as the provision of potable water, electricity, or assistance with land claims, people would be far more willing to participate and to give up their time because they have more to gain.

10.6 The research approach towards formulating a management plan

Breen (1992) argues that it is necessary to review the researcher's approach to research in order that the consequent contribution to resource management is improved. He poses three questions that are believed to be important in "closing the loop between research and implementation" or between the researcher and the resource manager. These questions ask, why is the research conducted? for whom is the research conducted? and how should the research be approached? To answer these questions, the following three principles are suggested by Breen (1992). The first principle is that research should be designed and conducted with the specific purpose of influencing the actions of people who manage resources. The second, is that researchers should adopt a participative approach to research in which key individuals within key institutions, responsible for managing resources, are targeted. The final principle is that research should be directed at informing the decision-making process.

However, where resources are utilised for consumptive purposes, it is necessary to add a third role player in this equation of participation, and that is the resource user. This is consistent with the notion of sustainability; that the participation of local people is vital in order to achieve sustainable development, and therefore, the sustainable utilisation of natural resources. Breen (1992) talks about a two-way process between the researcher and the resource manager in order to achieve true participation. However, as managers of protected conservation areas begin to allow local communities access to natural resources within these areas, it is necessary to adopt a three-way process. The term "resource user" takes on a new meaning, and is no longer synonomous with the resource manager. This process now includes the researcher, the resource manager, and the resource user, therefore requires a new approach to natural resource management.

This study is an attempt to adopt this new approach; however, it should be viewed as an initial assessment of the range of possible species for utilisation and various constraints operating on their utilisation. The recommendations provided in the previous chapter should be viewed as a platform on which joint decision-making processes can be built

before detailed planning is implemented. In order to test the appropriateness of a management plan, it may be desirable to implement it in a few pilot communities. It is suggested that a PRA-type approach is adopted for this purpose which requires an attitude of shared learning and contribution from all parties. This suggestion is based on the success of a number of other ventures reported in Uganda, Ghana, and Sierra Leone, and which are described in detail in Chapter 3. However, it must be noted that the protected areas involved are state controlled and funded, whereas the majority of the land within the TBR is privately owned and funded. This has implications for the sense of ownership of resources within these two different types of land tenure, as state land is ideally managed on behalf of its citizens, while private land is usually managed for self-gain.

10.7 The need for feedback of research findings

There is a need for feedback of the research findings by the researcher to the relevant parties operating within and surrounding the study area. It is not deemed acceptable that the researcher produce one written report in one language such as English, which is often only accessible to a select few or the literate. The report should also be reviewed by all participants to verify that the information is indeed a true reflection of the situation researched. Therefore, it is advocated that adequate resources such as time and finances are allocated in the proposal stage for adequate participative feedback sessions. In the case of this study, a verbal feedback session in the form of an interactive workshop is planned. The information will be relayed in both English and Zulu, and the invitation to the workshop will extend to all participants.

10.8 Gender issues

Ensuring the participation of women in development projects has become policy in many development organisations in order to address politically sensitive aspects of gender inequality and attempt to ensure their success (Mayoux, 1995). However, based on her own research and an extensive review of secondary sources, Mayoux (1995) believes that the underlying gender inequalities inherent to a particular community or culture will not be addressed by merely increasing the numbers of women involved in participatory projects. She suggests that unless strategies of positive discrimination and organisational structures

are implemented, "participatory development for women" in most cases will only lead to a "further increase in the unpaid contribution of women to development programmes from which they receive little benefit" (Mayoux, 1995).

In the study area, it was apparent that woman did not enjoy the same power and freedom of speech and action as their male counterparts. This inequality is apparently entrenched in Zulu culture and is perceived to be a major constraint in formulating meaningful management plans, especially in cases where women are the resource users. Although participation for women was greater than for men in the information gathering phase, women will most probably not be permitted to take part in resulting management decisions. As Mayoux (1995) suggests, strategies of positive discrimination and organisational structures may be necessary to ensure the true participation of women. However, these strategies should not be the cause of additional gender conflict. The present farm workers' committee is comprised of only men, and if it is not deemed acceptable to include women in this structure, it may be necessary to form additional organisational structures that do.

10.9 Conclusion

The role of the researcher in the design of management proposals for the sustainable utilisation of natural resources should be limited, as it is no longer acceptable for an outsider to make recommendations without ensuring true participation of relevant parties, i.e. both the resource managers and the resource users. The researcher should elicit information that will facilitate and empower all the relevant parties so that they can formulate meaningful partnerships and develop a sense of ownership and responsibility towards the resource base. If this is not achieved, the research and derived recommendations become part of another volume on a shelf, referred to only by other academics. It is not suggested that standards are lowered in terms of scientific research, but that recommendations encompass more than just ecological principles and an outsider's view of what should take place.

An important issue to emphasise is that the **process** involved in formulating a management plan is extremely valuable, and perhaps as important as the end-product (the management

plan) itself. Participation in this process is considered absolutely vital in order for regulations to be understood, accepted and put into practice. It is thus possible for participants to develop new mind sets and realities, rather than imposing their entire set of values on others.

In conclusion then, achieving the goal of sustainable utilisation of natural resources is extremely complex and requires redefining the role of the researcher. The focus of current ethnobotanical research which is predominantly ecological, also needs to be extended to encompass economic and social dimensions.

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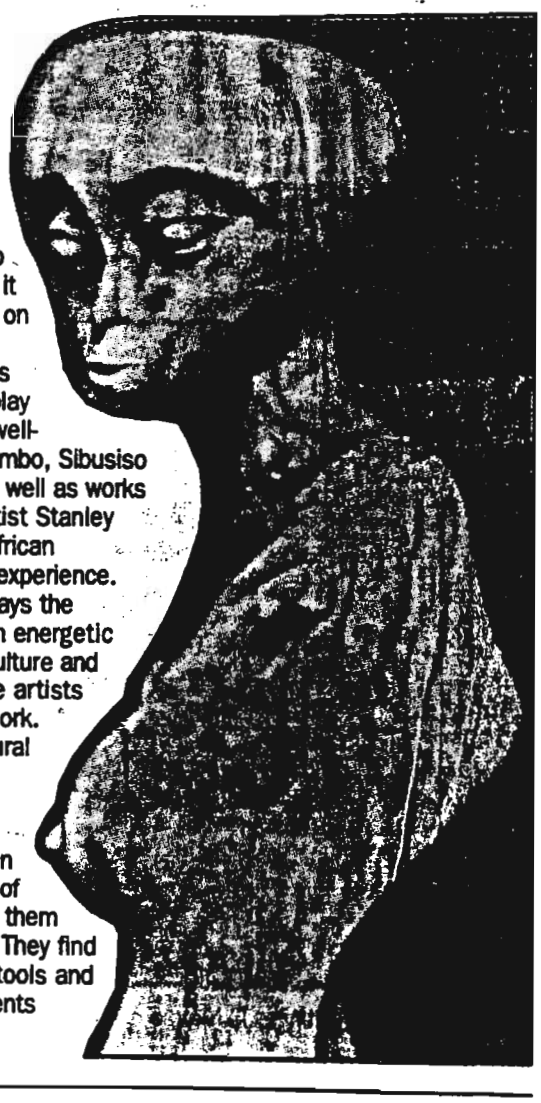
APPENDIX 1

A NEWSPAPER ARTICLE ON THE WOODCARVING WORKSHOP HELD AT THE NATAL TECHNIKON, DURBAN, OCTOBER 1995 (SUNDAY TRIBUNE, DECEMBER 3, 1995)

DECEMBER 3, 1995



When Raphael Magwaza and Johannes Dlamini attended a Swedish-sponsored woodcarving workshop held recently at the Natal Technikon, they arrived without any tools. They solved the problem by buying an axe and splitting the blade in two so they could each use one half of it for their work. This work is now on display at a *Mother and Child Christmas Exhibition* at Durban's African Art Centre. Also on display are new wood sculptures from well-known Zulu artists Timothy Mlambo, Sibusiso Mapumulo and Julius Kuboni as well as works from prominent Mozambican artist Stanley Vilakazi. The works reflect an African interpretation of the Christmas experience. Centre co-ordinator Kerry Ray says the Technikon workshop provided an energetic exchange of ideas, concepts, culture and techniques which stimulated the artists and led to new trends in their work. Most of the artists were from rural KwaZulu-Natal and experienced difficulty supporting their work. Creating sculptures and other forms of art is their only vocation and all proceeds from the sales of their creations are forwarded to them by the Centre, at no extra cost. They find it particularly difficult to obtain tools and often rely on makeshift instruments with which they work.

APPENDIX 2

THE REPORTED USE OF TREE SPECIES IN THE WEENEN AREA BY LOCAL COMMUNITIES

Pooley (1994) was used as a source of reference during the study for the identification of species (scientific and Zulu names). The trees are listed in alphabetical order according to scientific names. The number of times a particular use was reported is recorded in parentheses in the table. The scientific names of several species could not be confirmed or located in Pooley(1994) and are marked with a question mark. The family, English, and Afrikaans names were obtained from Pooley (1994). The exotic species have been placed at the end of the table.

No.	Family	Scientific name	Zulu	English	Afrikaans	Uses
1.	Loganiaceae or Asteraceae	*Buddleja saligna ?* *Tarchonanthus camphoratus ?*	iGqeba-elimlophe	False Olive or Wild Camphor Bush	Basterolienhout or Wildekanferbos	• Roots and sticks to induce vomiting (1) • Very good firewood (1)
2.	Mimosaceae	*Acacia caffra*	umTholo	Common Hook Thorn	Gewone Haakdoring	• Medicinal purposes, bark and root used to induce vomiting (3) • Poles for building (walls) (5) • Firewood (1)
3.	Mimosaceae	*Acacia karroo*	umuNga	Sweet Thron	Soetdoring	• Firewood (2) • Poles for building walls of houses (2) • Poles not used for building as they are eaten by termites (1) • Bark used as rope (1) • Yokes for oxen (1)
4.	Mimosaceae	*Acacia nilotica*	iSanqawe, umNqawe	Scented Thorn	Lekkerruikpeul	• Common building material (poles) because they are straight, and more resistant to termites (15) • Firewood (3) • Bark is boiled to treat chest problems (1) • Oxen yokes (1) • Pods eaten by goats and cattle (1)
5.	Mimosaceae	*Acacia robusta*	umNgamanzi, iNgamanzi	Ankle Thorn Splendid Acacia	Enkeldoring	• Not used as firewood as it brings bad luck to twins (1) • Firewood (1) • Building material (1) • Cattle, goats and buck eat pods and leaves (1) • Used to make yoke for oxen (1)
6.	Mimosaceae	*Acacia siberiana*	umkhamba	Paperbark Thorn	Papierbasdoring	• Meat trays (3) • Bark medicinally used to get rid of bile (1) • Not used as firewood as it burns the eyes when burnt (1) • Not brought into the house as it is thought to bring lightening. One carver places nails in the wood to act as lightening conductors (1) • Spoons (3)
7.	Mimosaceae	*Acacia tortilis*	umSasane	Umbrella Thorn	Haak-en-steek	• Firewood (4) • Poles for building walls of houses (2) • Not used for poles as it is not strong and eaten by termites (1)

						• Bark used to be used as rope for tying before the use of nails (1) • Not used for knobkierries as it is not strong (1) • Goats and buck eat leaves and pods (1)
8.	Apocynaceae	*Acokanthera oppositifolia*	inhunganyemba; inHlungunyembe	Common Poison-bush	Gewone Gifboom	• Medicinally used. Roots and bark are mixed and ground to form a syrup to treat headaches and snakebites (1) • Edible fruits (1)
9.	Rhamnaceae	*Berchemia zeyheri*	umNcaka; umNini	Red Ivory	Rooi-ivoor	• meat trays (4) • Spoons (6) • Bowls (dish and salad) (1) • Edible fruit (12) • Medicinally for vomiting, bark(3) • Firewood (4)
10.	Capparaceae	*Boscia albitrunca*	umVithi	Shepherd's Tree	Witgat	• Edible fruit (1) • Medicinal use (1)
11.	Asteraceae	*Brachylaena* sp.	iPhahla, umphahla			• Knobkierries (1) • Shield staves (1)
12.	Asteraceae	*Brachylaena ilicifolia*	iGqeba	Small Bitter-leaf	Fynbitterblaar	• Firewood (1) • Previously used as a crown to decorate married women (1) • Poles for building (1)
13.	Logaiaceae	*Buddleja saligna*	uNqandambazo	False Olive	Witolienhout, Basterolienhout	• Used as building material often as it is not eaten by termites (1) • Sticks make strong knobkierries (1) • Firewood (1)
14.	Celastraceae	*Cassine transvaalensis*	umGugudu; iNgwavuma	Transvaal Saffron	Transvaalsaffraan	• Edible fruit (3) • Endangered (1)

						• Firewood (1) • Medicinally used as an enema and to induce vomiting (1)
15.	Verbeaceae	*Clerodendrum glabrum*	uPhehlacwathi; uPhelecwathi	Cat's Whiskers, Verbena Tree, Tinderwood	Tontelhout, Stinkboom	• Previously used to start fires before the advent of matches (1) • Used medicinally to heal small goats, kills worms (not used for people) (1) • Firewood (1) • Building material (1)
16.	Rubiaceae	*Coddia rudis*	isiGugwane; umGogwane	Small Bone-apple	Kleinbeenappel	• Roots are used medicinally to induce vomiting (1) • Firewood (1)
17.	Combretaceae	*Combretum apiculatum)*	imBondwe, umBondwe, umBondwe-omnyama	Red Bushwillow	Rooiboswilg	• Statues and ashtrays (1) • Very good firewood (1)
18.	Combretaceae	*Combretum erythrophyllum*	umDubu	River Bushwillow	Riviervaderlands-wilg	• One woodcarver has heard that this wood is good for carving (1) • Burns the eyes when burnt (farmer) (1) • Poles for building (1)
19.	?	?	uMombo, uMombu, uMumbu			• Umbhuku, moulds for making beerstrainers (amavovo) as it is light (2)
20.	Araliaceae	*Cussonia* sp.	umSenge	Cabbage Tree		• Meat trays (1)
21.	Mimosaceae	*Dichrosyachys cinerea)*	uGagane	Sickle Bush	Sekelbos	• Firewood (3) • Bush encroachment problem (farmer) (1) • Hut building, red ant/termite does not eat it (2) • Hammer handles (farmer), (1) • "Droppers" in fencing (framer) (1) • Knobkierries (1) • Roots boiled up and applied with a cloth to medicinally treat sore feet (1)
22.	Ebenaceae	*Diospyros lycoides ?*	umNqandane, umNqandani	Bluebush	Bloubos	• Edible fruit (1) • Not used for firewood as it is used medicinally (1) • No fruit (1) • Sticks medicinally used to prevent evil spirits and to prevent storms (1)

						• Firewood (1) • Branches used for weaving in between poles as it is very flexible (1)
23.	Sterculiaceae	*Dombeya cymosa*	iGcibo	Natal Wild Pear	Nataldrolpeer	• Poles for building (4) • Knobkierries (2) • Shield staves (1) • Branches to weave between poles of wall frame because they bend (1)
24.		*Drypetes arguta or Rinorea angustifolia (?)*	umggwonyamfengane (umgudlamfene ?)			• Bark and roots used to induce vomiting or steaming for luck (1)
25.	Boraginaceae	*Ehretia rigida (440P)*	umHlele; umKlele	Puzzle Bush	Deurmekaarbos	• Short spears (4) • Firewood (1) • Building material (1) • Edible fruit (nice red fruit) (1)
26.	Zamiaceae	*Encephalartos* sp.	isigqiki-somkhovu			• Root, stem and bark used, sprinkled to prevent bad spirits (1)
27.	Caesalpiniaceae	*Erythrina* sp.	umSinsi	Coral Tree	Koraalboom	• Drunk or used as an enema for medicinal purposes (1)
28.	Ebenaceae	*Euclea crispa*	umGcalanci, umGcalacu	Blue Guarri	Blouhgwarrie	• Edible fruit (3) • Firewood (1) • Roots medicinally used to treat toothache (1) • Knobkierries (1) • Building (1)
29.	Ebenaceae	*Euclea schimperi*	iDungamuzi, uDungamuzi	Bush Guarri	Bosgwarrie	• Not used for firewood as it is believed to cause separation within families (7) • Medicinally used for sprinkling to ward away evil spirits (1).
30.	Rubiaceae	*Gardenia* sp. ?	iKhati			• Hut building, twigs are used to weave between poles (1) • Firewood (1)
31.	Tiliaceae	*Grewia flava ?*	umHlabampunzi	Velvet Raisin	Fluweelrosyntjie	• Knobkierries (2)
32.	Tiliaceae	*Grewia occidentalis*	iNhlolo; iKlolo	Cross-berry	Kruisberrie	• Poles for building (18,V) (2) • Firewood (V) (1) • Roots used medicinally to clean the blood (1) • Edible fruit (1) • Knobkierries (1)
33.	Anacardiaceae	*Harpephyllum caffrum*	umGwenya; amaGwenya	Wild Plum	Wildepruim	• Edible fruit (9)

34.	Sapindaceae	*Hippobromus pauciflorus*	uThiye; uThiya	False Horsewood	Basterperdepis	• Roots used to induce vomiting for luck (2) • Firewood (1)
35.	Capparaceae	*Maerua angolensis ?*	uGodide, umHliswa	Bead-bean Tree	Knoppiesboontjie-boom	• Used medicinally to induce vomiting ? • Not used medicinally (1) • Firewood (1) • Used in building to make frames for doors, makes planks, not strong (1)
36.	Celastraceae	*Maytenus heterophylla*	isiBhubhu	Common Spike-thorn	Gewone Pendoring	• (Ubhubhubhu). Roots and sticks used to induce vomiting for luck (2) • Firewood (1)
37.	Celastraceae or Flacourtiaceae	*Maytenus heterophylla ?/ mossambicensis ?* or *Dovyalis rhamnoides ?*	isiQoqoba; umQoqoba	Common Spike-thorn/ Black Forest Spike-thorn or Common Sourberry	Gewone Pendoring/Swartbop endoring of Gewone Suurbessie	• Firewood (1) • Building materials (1) • Birds eat fruit but not people (1)
38.	Oleaceae	*Olea europea* subsp. *africana*	umNqumo	Wild Olive	Olienhout	• Meat trays (3) • Knobkierries from branches (13), roots (1) • Spoons (2) • (Salad) bowls (1) • Ornamental (birds, busts/statues) (1) • Firewood (1) • Edible fruit (1) • Medicinally for vomiting (1) • Building materials (poles), more resistant to termites (7) • 10.Branches used for thin sticks for building ? (1)
39.	Anacardiaceae	*Ozoroa paniculosa*	isiFuce; isiFice	Common Resin Tree	Gewone Harpuisboom	• Gum taken by bees (1) • Medicinally used as an enema and to induce vomiting (1) • Firewood (1)
40.	Sapindaceae	*Pappea capensis*	imVuma; umVuma	Jacket-Plum, Bushveld Cherry	Doppruim	• Medicinally - bark used to induce vomiting (2) • Edible fruit (3) • Firewood (1) • Building (1) • Knobkierries (1)

41.	Rubiaceae	*Pavetta ?*	umQathonga			• Firewood (1) • Edible fruit (1) • Building material to make frames for doors (1)
42.	Ptaeroxylaceae (	*Ptaeroxylon obliquum*	umThathi; umThathe	Sneezewood	Nieshout	• Axe handles (1) • Roots and bark used to induce vomiting (phalaza) to call ancestors back (1) and used as incense (strong smell) (1). • Carving knobkierries (1) • Building (1) • Firewood on special occasions (1)
43.	Anacardiaceae	*Rhus rehmanniana*	iNhlokoshiyane; uMadamangiyeka	Blunt-leaved Currant	Stompblaartaaibos	• Edible fruit (little red berries) (2), also eaten by birds (1) • Firewood (1)
44.	Caesalpiniaceae	*Schotia brachypetala*	umGxamu	Tree Fuchsia, Weeping Boer-bean	Huilboerboon	• Not used by one woodcarver as the ants get in the wood and ruin it (1) • Meat trays (4) • Edible fruit (1) • Medicinally used for vomiting (bark) (4) and for enemas (bark) (2) • Firewood (Good) (2) • Drink the nectar (2) • Spoons (1)
45.	Flacourtiaceae	*Scolopia zeyheri*	iChichamhlolo; iChichamuzi	Thorn Pear	Doringpeer	• Medicinally used. Roots and sticks are boiled and sprinkled (1) • Not used for firewood (1)

46.	Euphorbiaceae	*Spirostachys africana*	umThomboti	Tamboti, Jumping-bean Tree	Tambotie	• 1.Statues, animals and birds (1) • Seeds eaten by duiker in the winter (farmer) (1) • Not used as firewood as has poisonous latex (4) • Poles for building (1)
47.	Rutaceae	*Vepris lanceolata*	uMozane	Bushveld White Ironwood		• For building poles because it is straight (7) • Knobkierries (4) • Spirit tree (1) • Medicinally used to induce vomiting to clean the blood, leaves used to fetch and call one that has died (1)
48.	Sapotaceae	*Vitellaropsis dispar*	umPhumpulu, amaPhumbulu	Tugela Bush Milkwood	Tugelabosmelkhout	• Edible fruit (11,15,17,18,21,25,26,28,31) (9)
49.	Verbeaceae	*Vitex rehmannii*	umLuthu; umDuli	Pipe-stem Tree	Pypsteelboom	• Masks and statues (1). • Good firewood (3) • Poles for building (6) or planks (1) • Residents not allowed to use for poles(1) • Medicinally used as an enema (1) or bark and roots for sprinkling (1)
50.	Trimeniaceae	*Xymalos ?*	amaHlungangwane (umhlungwane?)			• Roots and sticks used to treat yellow eyes (jaundice) and bone diseases (1)
51.	Rutaceae	*Zanthoxylum capense*	umNgumabele; umNungumabele	Small Knobwood	Kleinperdepram	• Knobkierries (2) • Building material (1) • Firewood (1)
52.	Rhamnaceae	*Ziziphus mucronata*	umPhafa; lahlankosi	Buffalo-thorn	Blinkblaar-wag-n'-bietjie, Haak-en-steek-wag-n'-bietjie	• Generally not used for firewood as it is for burying amakhosi ("chiefs") (3), fencing graves (1), and to carry the spirit of a dead person (1), burial services (1), (2), although one person reported that it is not used for daily cooking in the house, but used outside when cooking Zulu beer for feasts or special occasions (1) • Building poles for the walls (3) • Branches used for thin sticks for building walls (1) • Edible fruit (1) • Roots and bark are used medicinally to induce vomiting (1)

53.	?	?	umGuguwezinhlanya			• Mixture of roots, stem and bark to cure madness (1)
54.	?	?	oMayime			• Roots, sticks and leaves used for sprinkling to prevent bad spirits (1)
55.	?	?	umFikijolo			• Poles for building (1)
56.	?	?	isisulula			•
57.	?	?	iiLwane, iluLwane			• Knobkierries (1) • Poles for building (1)
58.	Mimosaceae	*Acacia mearnsii*	?	Wattle		• Building poles for the roof (11)
59.		*Eucalptus* sp.		Blue Gum		• Wood cracks. (Meat trays) (1) • Roof poles (2)
60.	Bigoniaceae	*Jacaranda* sp.		Jacaranda		• Meat trays (1)
61.	Meliaceae	*Melia azedarach*	umSelinga	Syringa	Maksering	• Large meat trays (1) • Poles for building, not very strong so they have to rebuild more often (1)
62.		*Opuntia*	isiPhapha, amadolofiya	Wild Cactus, Prickly Pear		• Edible fruit (12)
63.		*Pinus* sp.		Pine		• Western style trays (1) • Benches (1) • Shield staves (1)
64.		?		Bottlebrush		• Meat trays (1)
65.		?		Poplar		• Spoons (1)