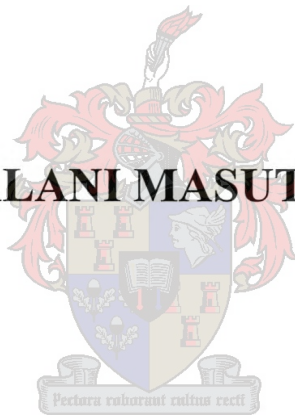


**COMMUNITY FORESTRY
AND
RURAL LIVELIHOODS:**

**A CASE STUDY OF THE CONTRIBUTION OF
NATURAL RESOURCES TO LIVELIHOODS OF
RURAL COMMUNITIES IN THE NORTHERN
PROVINCE, SOUTH AFRICA**

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**Thesis presented in partial fulfilment of the
requirements for the degree of Master of Science (MSc)
in Forestry Sciences in the Faculty of Agricultural and
Forestry Sciences
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DECLARATION

I the undersigned, hereby declare that the work contained in this thesis is my own original work and has not previously in its entirety or in part been submitted at any university for a degree.

Signature

Date

ABSTRACT

The Government of South Africa is faced with a mammoth task of redressing the imbalances of the past apartheid policies in the rural areas of the country. The Government has developed policies and programmes aimed at alleviating poverty in these areas. The Government has also realised the vital role that natural resources play in the livelihoods of rural people. The vision of Community Forestry as stated in the Forestry White Paper (GOSA, 1996), is to contribute to social and economic upliftment of all people, especially those in the rural areas, by promoting the sustainable utilisation of natural resources.

The study was conducted in three rural villages in the Northern Province of South Africa. The three villages were chosen because of their closeness to the Kruger National Park, their remoteness and lack of infrastructure that could provide employment to the villagers. The villages were investigated using Rapid Rural Appraisal techniques and semi structured interviews with households and key-informants.

The study reports on the pattern and structure of livelihoods and institutions that govern access to and control of natural resources in the woodlands that surround the three villages. It reports on the vital contribution that natural resources generate to livelihoods of the village communities by providing goods for fuel, shelter, food and medicines which are unavailable or unaffordable elsewhere for many households.

The study also reports on the decline in the dependency of the communities on natural resources and the lack of cooperation between village communities and the Kruger National Park authorities, which may lead to serious management problems in the area. Lastly, recommendations based on the study findings, that may bring about possible economic and social upliftment of the communities in the three villages are put forward.

OPSOMMING

Die Suid Afrikaanse Regering staan voor die reuse taak om ongelykhede wat in die verlede onder die apartheids beleid in die landelike gebiede van die land tot stand gekom het, te herstel. Die huidige Regering het 'n beleids en programstelsel ontwikkel met die doel om armoede in die gebiede te verlig. Verder het 'n besef ontwikkel van die integrale rol wat natuurlike hulpbronne in die lewensonderhoud van mense uit landelike gebiede speel. Die visie van gemeenskaps bosbou, soos uiteengesit in die Forestry White Paper (GOSA, 1996), is om deur middel van die bevordering van volhoubare gebruik van natuurlike hulpbronne, 'n bydrae te lewer tot die sosiale en ekonomiese opheffing van alle mense, maar spesifiek die in landelike gebiede.

Die studie is uitgevoer in drie landelike dorpie in die Noordelike Provinsie van Suid-Afrika. Die spesifieke dorpie is gekies a.g.v. beide hulle nabyheid aan die Nasionale Kruger Wildtuin sowel as hul afsondering en tekort aan infrastruktuur, wat werksgeleenthede aan die inwoners kan verskaf. Die dorpie is bestudeer m.b.v. die Rapid Rural Appraisal tegniek en semi-gestruktureerde onderhoude met huishoudings en sleutel-informante.

Deur middel van die studie word verslag gelewer op die lewensonderhouds patroon en strukture van huishoudings, sowel as die instellings wat toegang tot en gebruik van natuurlike hulpbronne beheer in die boslande rondom die drie dorpie. Dit dui die lewensbelangrike ondersteuning wat natuurlike hulpbronne aan huishoudings in die gemeenskap verskaf aan. Die ondersteuning word gevind in die vorm van materiaal vir vuurmaakhout, skuiling, kos en medisyne wat elders onbeskikbaar of onbekostigbaar is vir baie huishoudings.

Verder word verslag gelewer oor die dalende afhanklikheid van gemeenskappe van hierdie natuurlike hulpbronne en die tekort aan samewerking tussen dorpsgemeenskappe en die bestuur van die Nasionale Kruger Wildtuin. Dit mag wel tot bestuursprobleme in die nabye toekoms lei. Laastens word voorstelle, gebaseer op die bevindinge soos bespreek in die studie, gemaak wat mag lei tot die moontlike sosiale en ekonomiese opheffing van die gemeenskappe in die drie dorpie.

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DEDICATION

This work is dedicated to my dear wife Rendani, my two sons Thizwilondi and Anza, my daughter Munzhedzi, my mother Mudanalwo and to the memory of my late father Shonisani.

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Chapter 1. General introduction

1.1. Introduction

The policies of segregation and later apartheid which beset South Africa until the early 1990s, left the majority of black people in impoverished homelands that are characterised by high population densities, undeveloped and inadequate agricultural base and high levels of unemployment. The post apartheid government of South Africa is faced with a major task of redressing the imbalances of the past and improve the quality of life for millions of black people. The stated aim of the government is to develop policies that will have a positive impact on the poorest rural people of the country, especially in the former homelands.

It has been found, however, that for any government's developmental policies to succeed, they should be based on investigated current economic and livelihood status, local traditional and customary practices and existing land and resource tenure issues of the target community (Ford Foundation, 1998). The failure to clearly understand these issues has been a common cause of failure of government policies in many countries (FAO, 1994). Well-planned and researched community forestry programmes may ensure successful implementation and progress of the above plans and policies.

Community forestry approaches are aimed at eliciting rural people's own knowledge and expertise around issues concerning their community and building their capacity to effectively solve their needs, problems and concerns (FAO, 1978). Community forestry involves programmes and activities that can take place on communal land, or on land that has been allocated by the state, or on private land. However varied the objectives of the programmes might be, the unifying factor in all of them is that they involve local people, their ideas, livelihoods, needs and aspirations (FAO, 1985).

Sections 1.2. to 1.11. provide background information about community forestry concepts that this thesis is based. These are followed by sections outlining research

justification, relevance of the study, aims and objectives, research questions and the experimental approach that was followed in the study.

1.2. What is Community Forestry?

The term community forestry was defined by Food and Agriculture Organization (FAO) in 1978 as a spectrum of situations ranging from woodlots in areas which are short of wood and other forest products for local needs through the growing of trees at the farm level to provide cash crops and the processing of forest products at the household, artisan or small industry level to generate income, to the activities of forest dwelling communities (FAO, 1978). Community forestry excludes large-scale industrial forestry and any other form of forestry that contributes to community development solely through employment and wages, but it does include activities of forest industry enterprises and public forest services that encourage and assist forestry activities at the community level (FAO, 1991). Community forestry encompasses all tree-related activities that are carried out by individual households or farmers as well as activities involving the community as a whole. These activities are not only limited to tree planting on farms and households, but also include activities such as shifting cultivation, and the use and the management of natural resources. It embraces most of the ways in which forestry and the goods and services of forestry directly affect the lives of the rural people (FAO, 1978).

The government (GOSA, 1996) described community forestry as forestry that is designed to meet local, social, household, and environmental needs and to favour local economic development, based on the co-operation between the community, local and provincial governments and other national agencies, and implemented by the community or with the participation of the community.

The concept of community forestry is not new. Rural people all over the world have long been involved in the conservation and cultivation of trees on agricultural lands and forested areas, as well as depending on the surrounding natural forests for their livelihoods. Many of the practices and approaches used in various communities have

been developed over long periods. Often these practices emerged as responses to increasing environmental and climatic pressures (Shepherd, 1992).

1.3. The Utilisation of Non-timber Forest Products

Non-timber forest products (NTFPs) consist of goods of biological origin other than timber, as well as other services that are derived from the forest and allied land uses (FAO, 1995). Woodlands and forests supply many products and services essential to the well being of rural communities. Some of these products provide basic needs such as medicine, food and shelter while other products act as subsidies to agriculture, providing implements, browse and leaf mulch. Forests are primary sources of energy, in the form of firewood and charcoal and are a crucial source of essential subsistence goods (Clarke *et al.*, 1996). NTFPs provide for food and essential nutrients to both the rural people and their livestock. Foods include fruits, leaves, nuts and seeds, tubers and roots, fungi, gum and sap. Bushmeat provides a major source of protein in people's diets. Smaller animals, birds and invertebrates are more important food sources than larger game (Fischer 1993). Beekeeping for honey is practised in many rural areas (Falconer, 1990). Forest grazing and forest fodder for stall-feeding is important in households that keep livestock, especially during dry winter months (; FAO, 1995 and Clarke *et al.*, 1996).

Other uses of NTFPs include wood for fuel, wild herbs and medicinal plants, wood for utility items, dyes, mulch, and construction materials such as sand, clay, thatch, fibres, and poles, etc. (FAO 1995).

A large number of rural households are still dependent on the natural resource base for a variety of basic living requirements. Recent evidence indicates that natural resources make a real economic contribution to a wide range of rural households and are more than a safety net for the poor or a source of supplementary food, relieving the 'lean' periods in the agricultural cycle, and in smoothing out other seasonal fluctuations (FAO, 1995). Dealing in NTFPs provides employment during slack periods of the agricultural cycle, and can provide a buffer against risk and household emergencies. Activities based on the

natural resource base for income generation include the harvesting and trading in raw or processed forest and wetland resources (Shackleton *et al.* 1999).

The degree of use of NTFPs vary from region to region based on a range of factors, including resource availability and accessibility, institutional controls, population densities, employment levels, education levels, income levels, cultural preferences and the availability of alternatives (FAO, 1995). Poorer households and communities in remote rural areas, for instance, use more and a greater diversity of these resources and depend on these products for their livelihood. This is mainly because of having more access to the forests than to other resources and for lack of other options (Almeida, 1996).

Women usually rely more than men do on NTFPs for household use and income. In many places, women are responsible for the household activities that involve forest-based foods and medicines, as well as fuelwood. Children consume a wide range of wild food resources that are important sources of nutrients critical to the health and nutrition of poor rural children, especially during droughts (Ogle, 1996). More wild foods in rural areas are consumed by boys than girls because of the time spent herding livestock. Some of the children also sell these resources for pocket money or barter them for other foods such as bread and milk (FAO, 1995, Shackleton *et al.* 1999).

1.4. Land and Agriculture in Rural Areas in South Africa

Majority of rural households in rural areas practice some form of arable agriculture and keeping of livestock. The role of livestock in rural areas will be discussed under financial capital assets. Three forms of arable agriculture in rural communities can be recognised. The simplest form is practiced in home gardens, in the immediate vicinity of the homesteads. This is usually a small area dedicated to vegetables such as beans and pumpkins and small-scale cultivation of staple crops such as maize or sorghum (Shackleton *et al.* 1999).

The second form is large-scale cultivation in larger fields. Following ‘betterment’¹ planning in the 1960s in most regions of South Africa, communal land was divided into residential, cropping and grazing areas (Baber, 1996). It is in the cropping areas where large-scale cultivation of staple crop is practiced. The arable fields might be close to homesteads or quite far depending on the local zonation regulations. Access to an arable holding is in most rural areas connected to a particular residential stand, and the allocation system is administered by the headman or chief or in some cases, by local agricultural officials (Baber, 1996, Shackleton *et al.*, 1999). The third form of cultivation involves shifting cultivation on land that was not previously designated for agriculture, mainly in topographically difficult areas. This is usually because of the reduction of the size of the arable land due to the increase on demand of residential lands. Land is requested from the local institution and the woodland is cleared then crops are cultivated (Bhatt, 1998). This method has resulted in many of the mountain slopes in areas along the Soutpansberg mountains in the Northern Province being cleared for crop cultivation, usually to the detriment of the environment (pers. obs).

Crop production systems in rural households in the Northern Province involve agroforestry and intercropping. Typically, a staple crop is planted underneath and around fruit trees, or is intermixed with a number of additional crops such as beans, ground-nuts and wild spinaches. This is frequently seen as a risk avoidance strategy (Kirsten, 1996). Most of the agricultural products harvested in the rural areas are retained in the homesteads for home consumption. A small portion of surplus products may be donated to family, friends and neighbours, or sold locally or further afield (Shackleton *et al.*, 1999).

Until recently, the productivity of rural agriculture was considered very low compared to commercial and subsistence agriculture. Recent studies have however shown that this is not always the case and usually production outputs relative to inputs cost are much higher than is the case in larger-scale commercial agriculture. This indicates a more efficient

¹ Betterment was the term used to describe a policy under which land was to be demarcated into arable and grazing areas, stock was to be culled, and a host of restrictions, ranging from a ban on cutting trees to prohibitions on owning donkeys and goats.

production system with potentially greater profit margins than agriculture on private farms (D'Haese *et al.* 1998).

Agricultural contributions have been reported to be around 16 – 24 % to the total household income in households with access to land in the former homelands of South Africa (Ardington and Lund, 1996). Income derived from agricultural activities has been shown to be positively correlated with a number of other household attributes including: the area of land cultivated, proportion of household members that are able to help in the fields, availability of draught animals, household savings and wage earnings, among others (Shackleton *et al.*, 1999).

1.5. Tenure in Rural Areas

Natural resource tenure refers to the set of rights that a person or a group of people or a public entity hold in a natural resource. It includes the terms and conditions under which land and other natural resources such as trees and water are held and used (FAO, 1990). A tenure system is the set of tenures in a given community or society for different land uses or types of users. Tenure of land and trees affects tree planting, utilisation, management and conservation. This impact however varies from case to case depending on the diverse nature of tenure arrangements and other related factors (Rocheleau *et al.*, 1988).

Tenure comes in many forms. Some people may use a resource under “freehold”, “leasehold” and other indigenous land tenure system such as PTO (‘permission to occupy’). All these forms have evolved to meet tenure systems of particular groups according to their specific needs. The attempt to homogenize tenure by developing legislation that may override the local particular tenure system may not be successful as these systems are so diverse that they make generalisation difficult (IFAD, 1995)

1.5.1. Resource Regimes and Property Rights

Closely linked to tenure systems are the concepts of resource regimes and property rights. A resource regime is a structure of rights and functions that shows the relationship of individuals or communities to one another with respect to that particular resource (Bromley and Cernea, 1988; IFAD, 1995). Bromley and Cernea (1989) categorised land tenure into four resource regimes. These are state property regimes; private property regimes; common property regimes and non-property or open access regimes.

Property rights are defined as a set of rights and rules that govern the access of an individual or group to benefits that are derived from a particular resource. Bromley and Cernea (1989) argue that property is not particularly an object such as land and water, “but rather it is a right to a benefit stream that is only as secure as the duty of all the others to respect the conditions that protect that stream”. Property is therefore determined by social relationship between those with rights and those without. For property regimes to exist they depend on the existence of authority mechanisms and ability to enforce operating rules and maintenance provisions that will ensure that the integrity of the regime is protected (IFAD, 1995).

1.5.1.1. State Property Regimes

The state property regimes occur where rights of ownership, control and management of the resource rest in the hands of the state. The state may directly manage the resource as in the case of state forests, national parks and safari areas or indirectly through government agencies such as the military. Although individuals or groups of individuals might be able to use the resources, they only do so only at the forbearance of the state or the agency (IFAD, 1995). The state or the government agency makes decisions concerning access and the level and nature of resource exploitation (Feeny *et. al.*, 1990).

The state may also lease the natural resource to a group of individuals who are thus given usufruct rights for a specified period. For example, groups of individuals are given blocks

of marginal public land for tree planting but are not given titles to land. The group has been given usufruct rights on the land and ownership of whatever they produce (IFAD, 1995). Such usufruct rights however may not guarantee long-term tenurial security (Matose and Wily, 1996).

1.5.1.2. Private Property Regimes

Under private property regimes, the set of rights accrue to an individual 'owner' or group of owners. The essence of private property regimes is the legally and socially sanctioned rights of exclusion of other resource users and as a result, few landowners are entirely free to do as they wish with such resources (Bromley and Cernea, 1989). In an ideal setting, however, an owner is faced with a number of restrictions and obligations in the use of private land and its related natural resources. Benefits that are linked to private property regimes are based on the premise that the owner chooses to manage the resource well and produces products valued by the society (IFAD, 1995).

1.5.1.3. Common Property Regimes

These are regimes in which resource rights are held by specified group or communities of people or an identifiable community of interdependent users (Bromley and Cernea, 1989). These regimes are similar to those under private property regimes in the exclusion of non-rights holders.

Common property regimes, like other property regimes are dependent upon an effective system of authority to legitimise their rights and operating arrangements. Authority systems include tribal groups and subgroups, villages and sub-villages, neighbourhoods, kin systems or extended families, small transhumant groups and the state, among others. Some of these groups may hold customary ownership of certain natural resources and will regulate access and use of those resources, be it farm land, grazing land or water sources (IFAD, 1995). In contrast to state or private property, rights under common

property regimes are neither transferable nor exclusive within an identifiable group or community unless under some regulatory cultural customs (Matose and Wily, 1996).

1.5.1.4. Open Access or Non-property Regimes

Lawry (1990) defines open access regimes as a situation where a number of people or owners have equal access in their rights to use the resource. Under open access, each individual is able to make use of the resource without regard to the costs imposed on the others. These represent the regime where there is no property and thus no property rights. A resource under open access belongs to the first party to exercise control over it (IFAD, 1995).

Open access may also represent the breakdown of a management and authority system whose purpose was to enforce sets of norms and regulations aimed at controlling access and utilisation of that resource under one or other property regime. As these rights disappear, access to the resource becomes free and open to everyone (Matose and Wily, 1996).

The understanding of property regimes and their associated rights, duties, privileges and exclusions is important in natural resource utilisation and management policies. Understanding these regimes also helps to clarify the differences between common property regimes and open access regimes. Confusion around these two regimes often lead to common property regimes being regarded as free-for-all or open access regimes (IFAD, 1995).

In practice, natural resources are hardly managed within one property regime. For example, state lands have characteristics of both state and private property regimes and in the case where the state cannot exercise control or the authority of exclusion; state lands have characteristics of open-access regimes. As most countries in the SADC region experiencing adverse political and economic climate, they have difficulty in exercising authority over their state lands and are faced with encroachment, poaching and illegal

harvesting of resources from state owned lands (Matose and Wily, 1996). In this case state property regimes evolved into common property regime and may turn into open access regimes if the situation worsens.

1.5.2. Tenure Niches

A different perspective of property regimes from the one discussed above is the concept of tenurial niches. Three types of tenure situations that are related to particular management arrangement and ecological niches can be identified. Bruce *et al.*, (1993, cited in FAO, 1990) define a tenurial niche as a space in which access to and use of resources is governed by a set of rules. There are three tenurial niches: the agricultural holding, the commons and the government forest reserve (FAO, 1990).

The agricultural holding niche refers to farm units that may consist of individual or household farming operations. Different household or individuals may practise various forms of farming activities such as monocropping, alley cropping, windbreaks, forage and pasture, on such units. The key tenure issue in this niche is based on the extent to which the individual farmer or the household who has security of tenure carries out a particular farming investment on that resource or land.

The commons niche is based on the availability of the ‘commons’, which might be communal land, village woodlot, etc. Tenure rights in the commons are vested in a community. The important issue in this niche is the effectiveness of the community management and utilisation of the resource. Members of the community have rights to utilise the resource but unlike in the agricultural holding niche, the individual users within the community have no right to exclude others.

The government forest reserve niche includes all the natural resources that may be protected and managed by different units of the government for one reason or the other. Reserves are mainly created to protect resources from non-sustainable use. These may be natural forest with rare or valuable biological resources and genetic diversity.

Government reserves often involve the exclusion of farming and other consumptive resource utilisation and ineffective control of these reserves may lead to furtive or even open use of resources.

Matose and Wily (1996) argue that tenurial niches are more useful and suitable in sub-Saharan Africa than property regimes as traditional tenure systems tend to exist alongside western conceptions of tenure as introduced by colonial governments and included in existing statutory law. They also point out that tenurial niches, as opposed to property regimes, accommodate traditional tenure systems that divide land areas into different uses, with different rules and regulations applying to each use. This includes the use of land as private property in one season (e.g. in the growing season, when livestock is not allowed access) and as common property in the other (e.g. in the dry season when livestock from the community is allowed on to the land) (Shackleton *et. al.*, 1998).

The tenurial niche concept allows individuals or households to have user rights in all the tenure niches as is common in most African countries. For instance, while a household may have user rights in an agricultural holding, he may still have access and user rights to the commons and may obtain rights, by licence or permit system from the state or accepted custom, to utilise resources from forest reserves (Matose and Wily, 1996).

1.6. Common Property Resources

Shackleton *et. al.*, (1998) defined common property regimes (CPR) as ‘structured arrangements in which group membership is defined, boundaries are clear, outsiders excluded, rules are developed and enforced, incentives exist for co-owners to conform and sanctions work to ensure compliance’. This definition challenges the notion of the “tragedy of the commons”(Hardin, 1968 cited in Lawry, 1990), which equated communal property with no ownership and therefore no responsibility, with the eventual result being over-utilisation and degradation of the resource. In this definition, the use rights of individuals are defined and limited to prevent the over exploitation of the common resource base.

According to Lawry (1990), under minimum definition of common property, when local resource supply is not limited, common property is realized when group membership rules are well defined to exclude outsiders. Hardin's notion failed to distinguish between open access and common property and the absence of institutional control of common property resources.

Common property resources are resources that are co-owned and jointly used by a specific user group and utilised under some arrangement of the community or group management (Shackleton *et. al.*, 1998). They are composed of 'subtractable' resource units, which individuals can access and appropriate. The point of the subtractibility of the resource forms the basis of Ostrom's definition of CPRs (Ostrom, 1992). She distinguishes between collective goods and common pool resources. In this definition, collective goods can be utilised without subtracting from the quantity available to others (e.g. national defence) and common pool resources are defined as natural or man-made resources large enough to allow other users to obtain extractable produce such as wood.

Common property regimes are complex and are not as clear-cut as they appear in theory. As pointed out earlier, property regimes do overlap and different tenure systems and rights might pertain within one property regime. For example, individuals may hold private tenure over valuable resources found in the commonage. Open access regime might be found for lower value or resources that are more distant in common property areas and in some cases economically valuable, threatened rare or protected species within the commons might be governed under state property regimes (Shackleton *et. al.*, 1998).

The complexity of common property regime is extended further by the range of different user groups with different interests, roles and incentives for accessing the resource. Such a multiple user situation may lead to conflict because of inequitable access to resources and the destruction of other CPRs due to different management practices of other CPR user groups (Feeney *et. al.* 1990).

1.7. Land Tenure and Sustainable Resource Use: Myths and Experiences in the Northern Province, South Africa

There are theories and myths concerning tenure security and resource use that arise when issues around tenure are discussed. Most of the theories sound particularly convincing but they are not practical in rural areas of most developing countries, including South Africa.

The first myth surrounds the belief that security of tenure automatically implies good resource use and management. Wegerif (1998) argued that there are many people in South Africa who practice good land use without formal tenure security. There are cases where people have actually made long term investment on land they do not formally own. Wegerif (1998) gave six such examples in the Northern Province of South Africa.

There are people and institutions that hold tenure rights over a resource but utilise and manage the resource irresponsibly as is the case in the Gillimberg Farms in Potgietersrus (Wegerif, 1998). The farms were extensively farmed for several decades by crop farmers and then put up for sale after their productivity deteriorated. The farms have recently been rehabilitated by the local communities who up until recently did not have tenure rights.

A second myth centres on the land ownership and security of tenure. It is believed that security of tenure of land means ownership. That is true, but there are cases where that does not apply. Many people in the former homelands do not own tenure rights over land and other resources they depend on but they still occupy without owning the land. Wegerif (1998) estimates that 90% of people in the Northern Province of South Africa live with no legalised security of tenure. They may have 'Permission to occupy' (PTO) or not but they manage and utilise resources quite well. In communal areas despite the lack of formal security tenure people build and invest in land, build houses and plant trees.

1.8. Benefits of Communal Tenure for Rural Livelihoods

Communal tenure provides a safety net for the poor. Privatisation and nationalisation removes user rights away from traditional authority and the poor to few who are able to afford buying private land. Poor people rely on communal land for their livelihood. Communal tenure provides for more equitable ownership and access to land and a range of other resources including land (Wegerif, 1998).

The communal land tenure system is extremely cheap to operate with little or no maintenance and administration required. Usually the rights of access to a resource rest with the chief who with advice of his elders is able to allocate resources to his subjects according to need (Levin, 1996). Land allocation can be flexible in response to demand and land that is not used effectively can be taken away and given to somebody else who needs it. This is done without the lengthy process of legal documentation and fees involved (Delius, 1983).

In common property regimes, rights to land are inherited. One cannot lose residential land. This promotes investment for future generations (Wegerif, 1998). Unless under special circumstances such as wizardry and other social evils, people staying in communal property cannot be evicted (pers. obs.).

Common property regimes provide a good buffer against economic fluctuations. They spread the risks and provide for better risk avoidance. More people have access to multiple resources. They provide for a multiple livelihood basis and buffer against unemployment (Shackleton *et. al.*, 1998).

1.9. Sustainable Rural Livelihoods

For the purpose of this study, rural communities are defined as those householders not living in a formally declared town but in former apartheid “homeland” communal areas where agriculture (mainly dry-land cultivation and livestock) is the main contributor to

local livelihoods (Lipton *et al.*, 1996). These are areas with high human population densities, with large sprawling settlements, low availability of arable and grazing land per household and non-existent infrastructure and therefore lower employment opportunities. Households in these areas have lower cash incomes compared to urban and commercial farming households (Shackleton *et al.*, 1999).

It is in areas like this where new research has shown the role of agriculture and the harvesting of natural resource as important attributes of rural livelihoods and the significant impact these may have on the overall Gross Domestic Product of South Africa (Lipton *et al.*, 1996).

Chambers and Conway (1992) described livelihoods as comprising the capabilities, assets and activities that are required for a means of living. Assets in the definition refer to both material and social resources. Titi and Singh (1994) defined livelihoods as the peoples' capacities to generate and maintain their means of living, as well as enhancing their well-being. The above definitions differ from the definition by Lipton *et al.*, (1996), which confines livelihoods to narrow parameters of production, employment and income to the household. In the first two definitions, the concepts of economic development, strengths of the rural people, ownership, availability and accessibility of resources by rural people, reduced vulnerability and environmental sustainability of the resources are taken into account (Shackleton *et al.*, 1999). For rural livelihoods to be sustainable, they should be able to cope with and recover from vulnerability factors (e.g. trends, stresses and shocks) and be able to maintain and enhance their capabilities and assets and provide opportunities to future generations at the local and global levels (Chambers and Conway, 1992).

Rural livelihoods are highly differentiated by social identity and are influenced by factors such as class gender, age, location, education, and social and political influence. These factors also determine livelihoods options and opportunities. For example poorer people in rural areas have fewer choices available to them for securing their livelihoods and are more dependent on land and natural resources, while those who are more financially

secure rely on multiple livelihood strategies to secure a better living. Marginalized people, especially women may be denied access to natural resources as a result of cultural and/or institutional arrangements, thus affecting their livelihoods (Kepe 1997, Cousins, 1998, cited in Shackleton *et al.*, 1999).

1.10. Livelihood or Capital Assets.

There are five capital assets upon which rural people draw to build their livelihoods (Figure 1). These assets are natural capital (e.g. land, the resource base), human capital (e.g. education, skills, labour), social capital (e.g. institutions, organisations), physical capital (e.g. shelter), and financial capital (e.g. cattle, income, savings) (Carney, 1998). The combinations of these assets and the way in which they are affected by social identity, institutions, economic trends, and shocks such as droughts, diseases, etc. constitutes the base of a livelihood and also determine how vulnerable the livelihood may be (Shackleton *et al.*, 1999). The natural and financial capital assets will be discussed below and their inter-relatedness with the social, human and physical capital assets will be addressed.

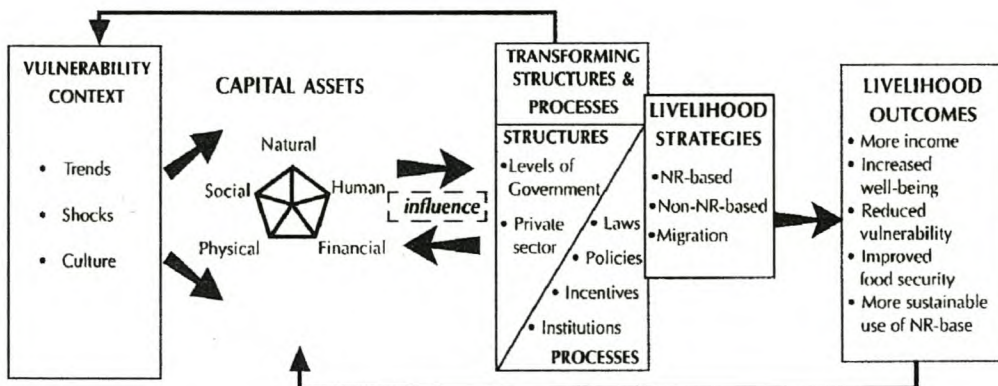


Figure 1. Sustainable livelihoods framework used to define the scope of and provide the analytic basis for livelihood analysis. (Adapted from Carney, 1998).

1.10.1. Natural Capital Assets in Rural Areas

Natural capital assets refer to the natural resources stocks from which resources that are required or useful for livelihoods are derived (Carney, 1998). These include resources such as water; land available for agriculture and non-timber forest products that local people are able to access for their livelihoods. The role of agriculture and non-timber forest products in enhancing rural livelihoods has been discussed in sections 1.3 and 1.4.

1.10.2. Financial, Human and Social Capital Assets in the Rural Areas

Human capital assets refer to the skills, knowledge, labour ability and good health important to pursue different livelihood strategies. Social capital assets refer to social resources such as relationships of trust among people, membership of groups, networks within and among communities and other human relations upon which people are able to draw in pursuit of their livelihoods (Scoones, 1998). Human and social assets are linked to financial capital assets in many ways.

There are several financial resources available to people in rural communities, which provide them with different livelihood options (Scoones, 1998). Much as the rural areas are characterised by poverty and lack of formal employment opportunities, rural people have multifaceted strategies of ensuring some form of financial income. An income and Expenditure Survey (IES) conducted in South Africa in 1995 identified fourteen sources of direct income and one indirect income to households. The fourteen direct incomes may be aggregated to form five main sources of income (McDonald and Piesse, 1996). Details of this income sources are shown in Table 1.1.

Table 1.1. Sources of household income in the rural areas. (Adapted from McDonald and Piesse, 1996). Main income can be divided into two major categories: direct and indirect incomes. Each of the main income can further be divided into aggregated income categories that are further subdivided into categories referred to in the text.

IES* Income Categories	Aggregated Income Categories	Main Income
Salaries and wages Profit income Letting income Royalties Interest received Dividends	Salaries and wages Profits and investments	Direct income
Pension Annuities	Pension and annuities	
Old age and war pensions Disability grants Family allowances Insurance fund income	Welfare income	
Alimony Remittances	Alimony and remittances	
Lobola/dowry Inheritances	Other income	Indirect income

* IES = Income and expenditure survey.

Direct incomes can be derived in several ways. Salary and wages in the rural areas can be derived from skilled employment, semi-waged employment, unskilled waged employment, domestic work, and other non-farm activities. Formal and skilled employment in rural areas is usually provided by state and private sectors such as education, safety and security and local administrations (e.g., teachers, police officials, clerks, etc). Semi-skilled jobs include vehicle driving, bricklaying, security work, or employment in the armed services, or in the mining and industrial sectors. Unskilled work includes manual and early apprentice work. This is usually short-term employment such as during weeding and harvesting seasons or when a building project is undertaken (Baber, 1996).

Profit income is derived mainly from self-employment. Self-employment in the rural areas is usually in the form of local small and medium businesses, (e.g. retail shops, butchery, milling, agricultural markets, informal retailing, small-scale building

contractors, ploughing, transport (e.g. donkey cart, taxi, trucks) mechanical repairs, traditional healing, rural handicraft production, etc (Baber, 1996, Rogerson, 2000).

Investments for the majority of people in the rural areas of South Africa are often not in the form of capital or financial markets investments. This is usually in the form of the type and number of livestock owned. Livestock ownership and production in the rural communal areas of South Africa generally serve to maximise the yield of consumable products and services for the household, as well as to increase the investment portfolio of the household. The size of the livestock herd is maintained for savings security and emergency and as such, sales are rare. Livestock is a good investment as most domestic animals provide income through sale of milk, manure used in the fields and draught services (Tapson, 1991).

Livestock represent a source of livelihood security by allowing owners to diversify risk and buffer poor crop yields, particularly in drought-prone areas. Livestock represent one of the few assets available to the rural poor and women that can be important in maintaining household survival in times of crisis. It is also a means of allowing the poor to capture private benefits from common property resources (Holden *et al.*, 1997).

The theory that land ownership confers easy access to credit may not hold in most of rural South Africa at the present economic situation of high level of unemployment and poverty. The rural poor, with their insecure and marginal livelihoods, are more likely to lose their land, because of the non-repayments of loans. The theory is true for rich people who may benefit from land privatisation as they have capital to honour the agreements with financial institutions (Wegerif, 1998).

Baber (1996) divides a household into two components, a resident component and a migrant component. The resident component includes all those who eat together and live under the same roof in the rural settlement. The migrant component is defined as all those that are identified by members as belonging to the household but spending a fraction of the 12 months away from the settlement. Migrant members, generally, are fully

committed to the resident members of the household, remit on a regular basis, and return to the households as frequently as possible. Some, however, may lack commitment to rural members or due to intermittent and poorly paid work, fail to remit regularly or spend considerable amount of time without contacting them. Remittance and level of support provided by migrants depends on the nature their relationship with the resident household: husbands are generally more committed than sons, and single parents more than young childless or unmarried adults (Baber, 1996).

Pension and annuities also provide a reliable income, especially to the aged who have had lengthy and stable employment either locally or as a migrant worker. Welfare grants come predominantly from the State and play an important role in lifting some households out of the worst extremes of poverty. The effectiveness of a welfare grant is also enhanced by the fact that some pensioners distribute part of their pensions to other households without remittances or other financial support (de Villiers, 1995).

The 'other income' in Table 1 is described by McDonald and Piesse (1996) as all the other form of income that does not fall into any of those listed in the table. These include incomes that accrue from arrangements such as lobola/dowry and inheritances.

1.11. Sustainable Rural Livelihoods Approach

The study of sustainable livelihoods and subsequent implementation of community forestry objectives may be achieved through the "sustainable rural livelihoods approach" (SRLA) as described by Carney (1998). The SRLA framework is centred around five different capital assets from which individuals build their livelihoods (Figure 1.).

The livelihoods approach analyses livelihoods themselves, the vulnerability of livelihoods to trends, shocks and culture. Trends that may affect a livelihood include the nature, quality and quantity of resource stocks, the density and the dynamics of the population, the existence of technology beneficial to the community, political affiliation of the people and the economic status of the community. Shocks that affect livelihoods

are climate of the area and civil or resource conflict in the area. Lastly, the effect of culture on asset management and livelihood choices they make is analysed (Carney, 1998).

1.11.1. Why the SRL Approach?

There are several features of SRLA that make it applicable to rural community developmental programmes as stated in planned government policies:

- The SRLA framework provides the analytical basis for livelihood analysis in the target community.
- The SRLA is people centred. Every programme is started with the analysis of people's livelihoods and how these have changed over time. It focuses on the impact of transforming structures, such as levels of government, and processes, such as different policies and institutional arrangements on people.
- It builds on the positives that people already have in their grasp by starting with the analysis of strengths rather than needs. It emphasises empowerment and self reliance
- SRLA is holistic in nature and recognises diversity. It acknowledges multiple livelihoods strategies that people adopt to secure their livelihoods. It seeks to achieve multiple livelihood outcomes to be determined and negotiated by people themselves.
- SRLA emphasises social and environmental sustainability. The approach works with people to help them understand or realise the impact that their livelihoods have on the environment and to other people within and without the community. This helps to promote sustainability as a long-term objective (Scoones, 1998, Carney, 1998 and Ashley and Carney, 1999).

1.11.2. Rapid Rural Appraisal (RRA)

RRA is a research methodology that evolved in the late 70s and 80s. It evolved as an approach to help minimize bias (spatial, project, gender, elite seasonal professional, etc.) and reduce costly, and usually inaccurate, approaches such as questionnaire surveys.

(Chambers and Gujit, 1995). It is a methodology that consists of systematic, semi-structured activities conducted on site with the aim of rapidly and efficiently collecting, analysing and evaluating information about rural life, knowledge, conditions and rural resources. The information is generated in close cooperation with the local population in rural areas (Sontheimer *et. al.* 1999).

RRA is one of the precursors of Participatory Rural Appraisals (PRA) that began to evolve at the end of the 1980s (Chambers and Gujit, 1995). PRA is a combination of approaches and methods that empower rural people to share, enhance and analyse their knowledge of life and conditions, enabling them to plan, to act, to monitor and evaluate.

Although PRA and RRA are similar in terms of methods used, they are different in terms of their objectives. RRA is mainly aimed at collecting information. It enables outsiders to gain information and insights from local people. Analysis of the collected information is carried out by the outsider away from the community. RRA can help generate information more quickly to help relevant institutions make wiser decisions about what they can do to contribute to solutions. PRA places emphasis on empowering local people to change their own conditions and situation. PRA enables local people assume an active role in analysing their living conditions, problems and potentials in order to plan and take action (FAO, 1994, Sontheimer *et. al.*, 1999).

1.11.3. Kinds of Rapid Rural Appraisals

There are five kinds of rapid appraisals (RAs) that can be identified. These are exploratory and survey, topical, monitoring and evaluation, planning (diagnosis and design) and participatory RAs (Messerschmidt, 1995).

Planning RAs are a forum for the design of new projects, or parts of projects. They are aimed at bringing local perspectives into the initial conceptualisation of projects that are being planned in a particular community. They also determine appropriate

implementation measures involving local people, indigenous knowledge and traditional systems of organisation.

Evaluation and monitoring RAs examine the performance of the physical activities and behaviour of staff involved in the project. Monitoring occurs during the life of the project and is a formative activity an evaluation occurs afterwards as a summative activity.

Exploratory RAs are used to study complex and interwoven social and natural environments of a place or community, in order to gain sufficient understanding before any community forestry programme can be implemented. Topical RAs in contrast are narrowly focused and deal with a particular issue or a special set of local activities.

Exploratory RAs have been used to establish community planning priorities, study village and regional agro-ecosystems, study the nature of traditional resource management systems and determine local conditions, opportunities, and constraints of forest utilisation and management in a community or region (MacCracken, *et al.*, 1988, Mascarenhas 1991, Messerschmidt, 1995).

Exploratory RAs encourage participation of local communities and can be used with baseline surveys that accompany pre-planning stage of projects. Typical RRA and PRA tools and techniques used in community forestry are basically exploratory tools, such as group interviews, informal surveying and brainstorming (Messerschmidt, 1995).

1.12. Research Justification

The South African government has through its Reconstruction and Development Programme (RDP) highlighted the need to develop rural areas throughout the country. The government identified several strategies to create sustainable growth and opportunities in the rural areas. These strategies are aimed at sustainable local economic development in which affected people themselves set the agenda. Community forestry

has been recognised as one of the multi-sectoral approaches aimed at achieving these RDP objectives (GOSA, 1996).

The Rural Development Framework (RDF) describes how the South African government aims to achieve a 'rapid and sustained reduction in absolute rural poverty'. This includes the involvement of people in decisions affecting their lives through actual participation in rural local governments' decision-making processes and the need for the local governments to plan, implement and assemble the essential information for planning, monitoring and evaluating the process of rural development. The RDF also recognises the need for the improvement of income and employment opportunities by broadening access to natural resources and resource conservation through investing efforts in the sustainable use of natural resources (GOSA, 1997).

The government has also realised the contribution of rural development to its Growth, Employment and Redistribution policy (GEAR) by diversified job creation and providing access to resources to improve household productivity. This need is further emphasised by the so-called triangle of development concept based on tourism growth, conservation and nation building (GOSA, 1997).

The population of Northern Province of South Africa is 4.9 million people. This number represents 12.1 % of the total South African population. The rural population of the Northern Province represents 89 % of the total population of the Province and is found mainly in the former homelands of Venda, Lebowa and Gazankulu. These are poverty-stricken areas within one of the poorest of all the nine provinces of South Africa (Steyn and Associates, 1998).

The Northern Province has a large consumer population with limited means in terms of income. The majority of goods consumed are sourced from beyond provincial borders. The province is also dependent upon inflows of capital, technology and management

expertise from beyond its borders (CSS, 1997a). Lack of local employment opportunities in the Province results in net migration of labour and net remittance of income to dependants in the Province, which constitutes an important source of income for provincial households. Formal sectors of the provincial economy have since 1990 displayed general decline in rates of labour absorption especially with the merging of former homelands Venda, Gazankulu and Lebowa into one province (CSS, 1997a).

Some 72 % of the population of the Province has been estimated to be living in poverty (CSS, 1997b). Meanwhile, 80 % of the population resides within areas designated less developed and displaying low economic growth, employment prospects and service backlogs (CSS, 1997b). Principal sectoral contributors to economic activity are mining and agriculture, which are severely affected by drought and fluctuating markets and services, represented in the main by administrative activities of government, and which dominated the provincial economy, contributing over 30 per cent of GDP (CSS, 1997).

Venda together with Transkei, Bophuthatswana and Ciskei were until 1994 regarded by the apartheid government of South Africa as 'Independent republics'. Venda is situated to the east of the Northern Province, bordering the Kruger National Park. Most of the region is highly dependent on employment outside the area with remittances providing the important part of the overall income (Critchley and Netshikovhela, 1998). Venda as a region has a comparative advantage over Lebowa and Gazankulu in the cultivation of crops (RAU, 1979). Infrastructural development is concentrated around Thohoyandou, the regional capital town, where most businesses are located. Poverty in the region becomes visible as one moves further from Thohoyandou into remote rural areas. The villages in the study are located 106km to the east of Thohoyandou.

In November 2000, a formal agreement was signed between South Africa, Zimbabwe and Mozambique on the development of the Gaza/Gonarezhou/Kruger (GKG) Transfrontier Park and Conservation Area. This is the second of such parks after the establishment of

the Kgalagadi Transfrontier Conservation Area between South Africa and Botswana. The establishment of the GGK will result in the three conservation areas in these three countries forming a protected area of just under 100 000 km². The concept of peace parks in the SADC region is aimed at maximising the subcontinent's rich natural assets and maintaining valuable biodiversity (DEAT, 2000). According to the Department of Environment and Tourism of South Africa, the park will attract local and foreign tourists and provide incomes for surrounding communities (DEAT, 2000).

The Department of Environmental Affairs and Tourism (DEAT) of the Northern Province has recognised the wealth and potential that the Eastern Lowveld of the province has in terms of adventure and ecotourism products. The Punda Maria and Pafuri areas in the Kruger National Park (KNP) have the potential to offer the best game drives to tourists in the Northern Province. This has led the Department to plan to establish a tourist route in the area that will encourage the development of cultural tourism and so reinforce the perception of the area as an arts and culture centre and open the northern parts of the province especially the previously disadvantaged areas (N. Province Tourism plan, 2000).

The establishment of a tourist route in this area enhances the provision of products targeted at regional mass market tourism from across the Limpopo, establish a route to the North that will open up the northern parts of the Province, extending south into the Kruger National Park; and focus on the previously disadvantaged areas of Messina, Masisi and Vhembe (N. Province Tourism Plan, 2000). The overall objective of this initiative is to reduce poverty and raise the socio-economic level of rural people in these areas.

Woodland resources would be better directed towards efforts that result in improved sustainability of cash flows into the communities to help develop and improve their standards of living.

1.13. Relevance of the Study

Community forestry, based on the active participation of the rural people is an important strategy aimed at improving the lives of the poor and to strengthen the sustainability of their livelihoods at all levels of the community.

Participatory community forestry programmes:

- ◆ provide the means so that rural populations can supply, or have better access to, certain basic needs in the form of forest and other tree products. These include the provision of fuel and other goods essential to meeting basic needs at the rural household and community level. This objective includes the means to increasing the overall production of wood or other tree products to counter growing deficits.
- ◆ provide food and the environmental stability that ensures continuous food production. This involves the use of human resources to better manage the degraded and marginal land thereby counteracting the process of deforestation and environmental degradation.
- ◆ contribute to the general socio-economic development of rural people through the generation of income, employment, and institution building in the rural community as a whole, meeting the demands and aspirations of all, both men and women, subsistence farmers, herders and the landless in the rural community (adapted from FAO (1985)).

1.14. Aims and Objectives

The aim of this study is to investigate the pattern and structure of rural livelihoods and the institutions that govern access to and control natural resources in three rural villages in the Northern Province. The village territory in this study was described as a land area which is habitually used by members of an agrarian community for their livelihoods, with boundaries that are recognized by members of the spatial unit and by those residing outside the territory (Painter, 1991).

1.15. Research Questions

1. What are the overall patterns and extent of the utilisation of natural resources in livelihood strategies in the three rural communities?
2. How do existing natural resource management practices and policies affect the people's utilisation of natural resources?
3. What is the potential for the implementation of natural resource-based community forestry development programmes in reducing rural poverty in the three study villages?
4. What community forestry programmes, aimed at reducing poverty in the rural areas, can be introduced in the communities?

1.16. Research Objectives

Objective 1. Resource description and assessment

This objective will attempt to answer the first part of the first research question that deals with the natural resources. The objective will involve the identification and the description of the existing resource base in each of the study villages, and examining the range of land resource units.

Objective 2. The utilisation of resources

The second part of the first research question will be dealt with in this objective. The utilisation of forest based resources at community and household level will be assessed. The study will also identify who uses the resource, which or what product is used and when the product is used in the community.

Objective 3. Management of resources: tenurial and institutional issues

The second research question will be addressed in this objective. The study will identify rules and institutions that govern tenure and management of natural resources. Local and state rules and regulations, community institutions and external institutions will be identified and their roles defined in terms of their relationship with the communities in the three villages.

Objective 4. What are the resources worth?

The study will through household surveys and key-informants interviews and market analysis determine the value of the resources that are utilised in the villages. This will provide an idea of the potential of natural resource-based community forestry programs that may be introduced in the communities.

Objective 5. The status of community forestry at local government level

Objective 5 is aimed at addressing research question four. Current legislation and policies around community forestry in the study area will be investigated. Community forestry programmes that are currently running in the village will be investigated.

1.17. Experimental Approach

1.17.1 Achieving Research Objective 1

(a) In each community the village territory and the existing resource base will be identified through participatory maps (village and territorial maps) drawn by villagers

(b) A transect of each of the villages will be drawn with the help of the villagers. The transect will be used to elicit information with regards to land use, trees, animals, soils and resource tenure in each of the zones along the transect.

(c) Aerial photographic analysis will be conducted.

(d) Key informant interviews and historical timelines will be used to determine the changes that may have taken place in the villages over the years.

1.17.2. Achieving Research Objective 2

Resource utilisation information will be gathered through products collection calendar and resource cards activity and through household surveys and interviews.

1.17.3. Achieving Research Objective 3

Information around the institutions and rules that govern the management of the resources will be gathered through Venn-diagram activity, semi-structured interviews with the villagers and key informant interviews.

1.17.4. Achieving Research Objective 4

Economic value of products will be determined based on inventories of range of products that are regularly used by households (products mentioned during house-hold surveys). Market analysis in each village will be conducted through interviews with key informants such as farmers, producers and craft-people, traders and resource vendors, builders and butchers. Further information will be collected during visits to markets in where some of the resources and products are traded.

1.17.5. Achieving Research Objective 5

Informal interviews will be conducted with local government officials about their position in implementing community forestry programmes. The role and status of community forestry in local tertiary institutions will be assessed through communication with personnel from local Universities, Technikons and Agricultural Colleges.

1.18. Conclusion

Sustainable poverty elimination in rural areas can be achieved only if external aid focuses on what matters to people, recognises the dynamic nature of livelihood strategies, understands the differences between groups of people in different areas and implements poverty focused development activities in a way that is congruent with their current livelihood strategies and their social environment (Carney *et al.*, 1999).

From the discussions above, community forestry is a term that denotes a wide range of activities that are carried out in the rural areas that link people with forests and trees, and the products and benefits that are derived from them. The range of diversity of linkages between trees, forests and people span different disciplines such as agriculture, rural economics, forestry and rural energy.

Sustainable rural livelihood framework is just one tool for rural livelihoods analysis. Other methods, including elements of poverty, stakeholder and institutional analysis are required to implement sustainable rural livelihood approaches. Sustainable rural livelihood analysis can contribute to the process and content of policy dialogue aimed at eliminating poverty. It also provides an invaluable basis for design of projects that are underpinned by a commitment to prioritising the needs of the poor (Ashley and Carney, 1999).

The establishment of the GKG, the development of tourism routes and associated planned infrastructural development in this area will have an impact on the lives of people in this villages. However, little is known about the details of the rural economy and livelihood strategies in this area. The study will endeavour to provide policy makers with current estimates of the potential impact of envisaged programmes on the livelihoods of people in rural areas.

Chapter 2. Description of the Study Area and Research Methods Used.

2.1. General Description of the Study Area

2.1.1. Geography of the Study Area

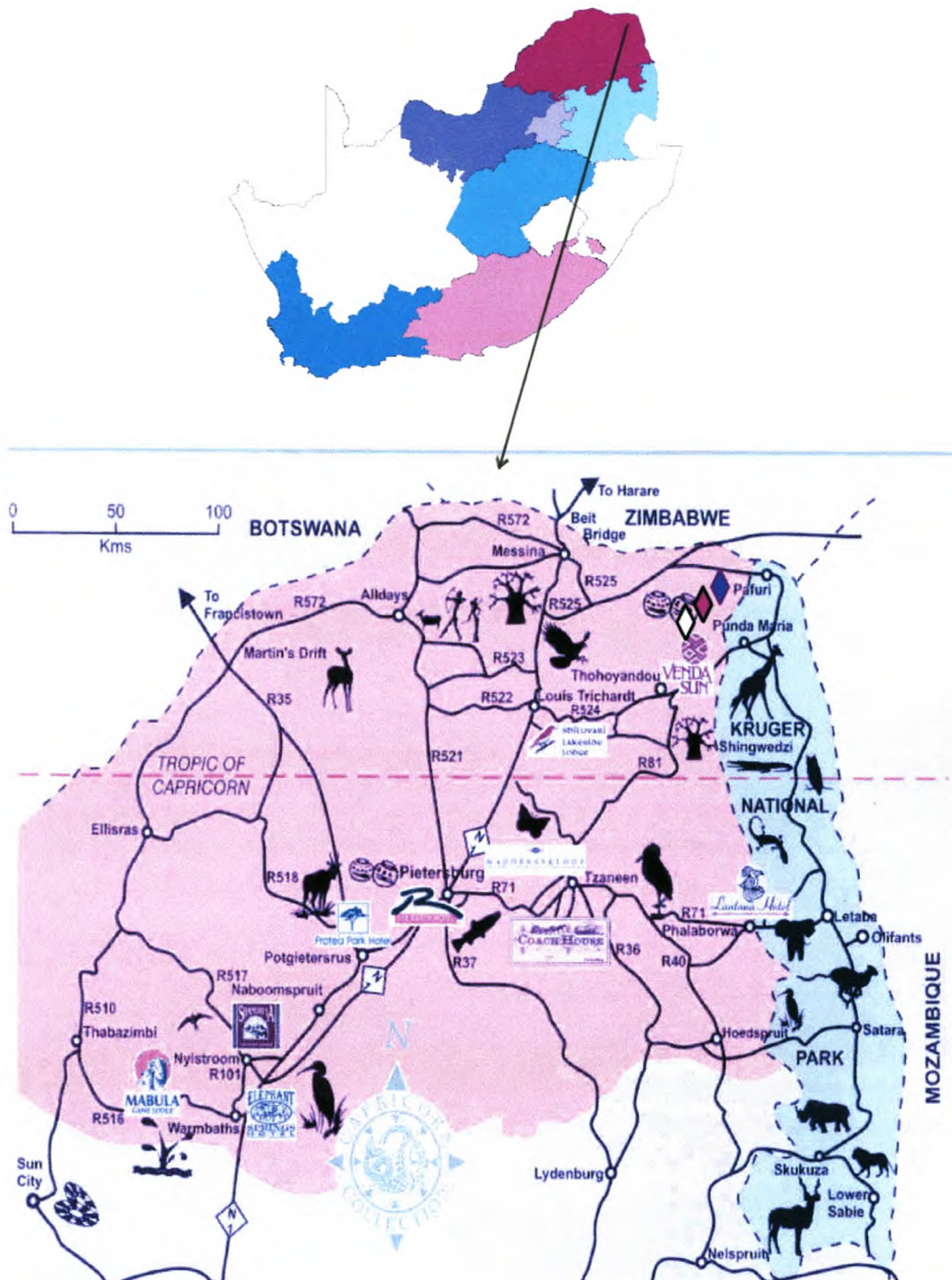
The Northern Province of South Africa covers both the tropical and subtropical regions, which has an influence on native vegetation and agricultural practices. Though the Province has a wide range of annual rainfall, from <500 mm to >1000 mm, most parts are relatively dry with annual rainfall below 600mm. 77 % of the Northern Province is semi-arid (Fullard *et. al.* 1994).

The area chosen for this study was the Lowveld of the Northern Province. This is a low-lying area next to the northern section of the Kruger National Park (see Map 2.1.). The altitude ranges from 350 to 550 metres above sea level². The soils are loamy sands and clayey soils in the undulating granitic landscape around the northern KNP, scattered with sandstone, shale and basalt of the Limpopo River valley (van Rooyen and Bredenkamp, 1998).

2.1.2. Climate of the Study Area

The area experiences annual rainfall ranging from 250 mm to over 600 mm. The average annual rainfall for the period between 1981 and 1991 is 450 mm with an annual rainfall of 834 mm recorded in 1985 (Figure 2.1.). The highest amounts of monthly rainfall were recorded in January, February and April in 1988, 1985 and 1986 respectively (Figure 2.2.). The average number of rainy days (rainfall greater than 1 mm) in spring and summer (October – March) is sixty-three (South African Weather Services, 2001). Hailstorms do occur occasionally in the area, but with insignificant impact on agricultural productivity (pers. comm. with villagers).

² The nearest weather station to the study area is Punda Maria (No. 07680113) at $\phi 22^{\circ} 41' S$ $\lambda 31^{\circ} 1 E$. Height is 462 m above sea level.



Map 2.1. Map of the study area showing the location of the three study villages, Bend-Mutale village indicated by a blue diamond, Ha-Nkotchwi village indicated by a red diamond in the middle and Musunda village, a yellow diamond at the bottom closer to Punda Maria. (Picture adapted from The Tourism Blueprint Provincial Guide to South Africa).

The summers in the study area are hot (see Figure 2.3.). The months of January and February are the hottest with averages of 26.6 and 26.3 respectively. The highest temperature of 42 °C in the region was recorded in 1983. Winters are mild to warm. Neither frost nor snow has been experienced in the past 30 years. The lowest temperature recorded in the area is 6 °C in June 1982 (South African Weather Services, 2001).

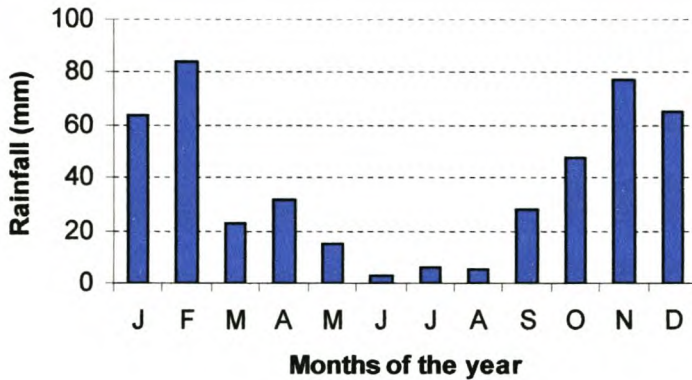


Figure 2.1. Amount of rainfall (mm) recorded in the study area in the Northern Province in a period of ten years (1981 – 1991). (Data recorded in Punda Maria, South African Weather Services)

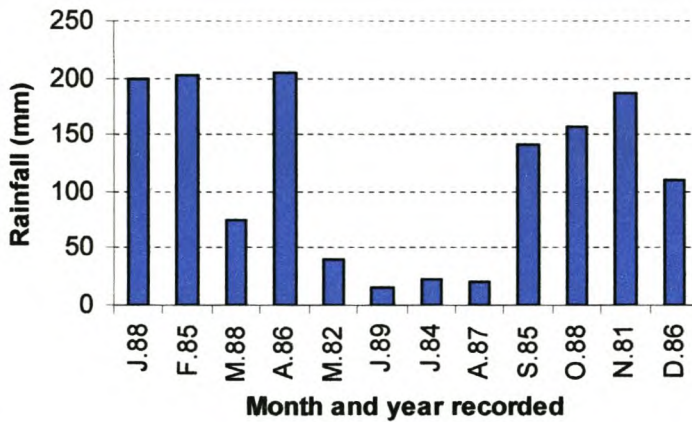


Figure 2.2. Highest monthly-rainfall amounts (mm) recorded in the study area between 1981 and 1991. (Data recorded in Punda Maria, South African Weather Services)

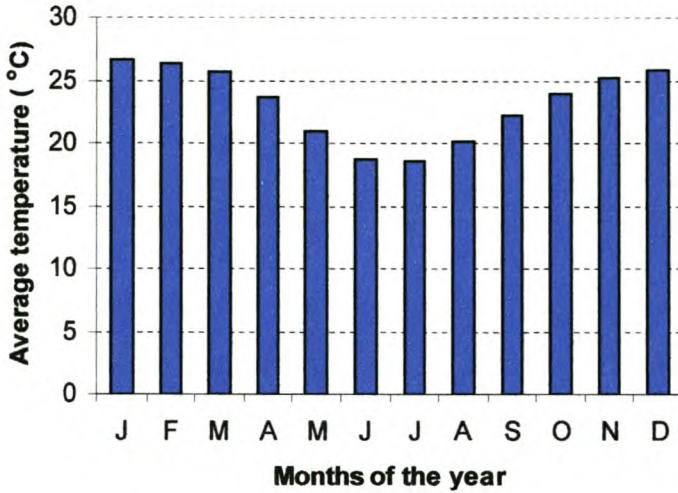


Figure 2.3. Monthly average temperatures (°C) recorded in the study area over a period of ten years (1981 – 1991) in the Northern Province. (Data recorded Punda Maria, South African Weather Services)

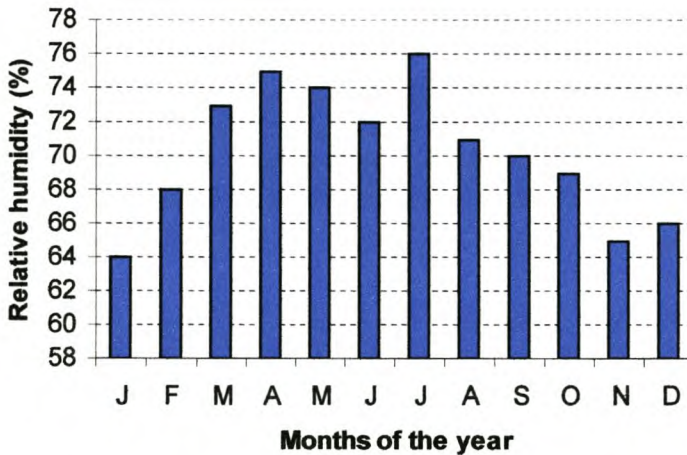


Figure 2.4. Mean relative humidity (%) recorded in the study area over a period of ten years (1981 – 1991) in the Northern Province. (Data recorded Punda Maria, South African Weather Services).

The vegetation type of the area is mopane bushveld of the savanna biome (Acocks, 1988). It is characterised by a fairly dense growth of *Colophospermum mopane* and mixtures of *Colophospermum mopane* and *Combretum apiculatum*, associated with *Acacia nigrescens*, *Adansonia digitata*, *Comosphora* spp., *Boscia albitrunca*, *Sclerocrya birrea*, *Acacia tortilis* and *Kirkia acuminata*. The shrub layer consist of well developed,

scattered individuals of *Grecian* spp., *Acacia senegal*, *Ximenia caffra*, *Commiphora africana*, *Boscia foetida* and *Dichrostachys cinerea*. The herbaceous layer is made of grasses such as *Enneapogon cenchroides*, *Aristida congesta*, *Panicum maximum*, *Stipagrostis uniplumis*, *Pogonarthria squarrosa* and *Digitaria eriantha* (Acocks, 1988; van Rooyen and Bredenkamp, 1998).

2.2. Geographical Location of the Study Villages

Villages that were selected in this study are Musunda, Ha-Nkotchwi and Bend-Mutale. All three villages are bordering the Kruger National Park. They are situated between the Punda Maria and the Pafuri gates in the Northern Province (Map 2.1).

Bend–Mutale is situated between the Limpopo and the Mutale rivers. The village is about 2 km from the Pafuri gate of the Kruger National Park, along the R525 provincial route. The village is bordered by Tshikuyu village to the west, Ha Nkotchwi village to the South and Kruger National Park fence to the east. To the north, the village extends up to the Madimbo military (border) fence, next to the Vhembe (Limpopo) River.

Ha-Nkotchwi is a small village that borders Bend-Mutale to the South across the Mutale River. The village borders the Makuya Park in the East, Musunda village to the South and Mukoma-wa-bani to the West. Tshikondeni coalmine is situated to the South of the settlement in the village.

Musunda village ranges from the Langwe River in the west to the fence of the Makuya Park in the east. The Govhabenzu River forms the boundary to the north and the Luvuvhu River in the south. It is about 19 km from Makuya village to Musunda along the main road from Sibasa to Masisi.

2.3. Methodological Overview: Exploratory RRA Methods and Tools Used in the Study

The following sections provide basic background information on the methods that were used in the study, to justify their relevance in the study. The topics covered include an overview of the sustainable rural livelihoods approach, an overview of kinds of Rapid Rural Appraisal and the discussion about the RRA tools that were used in the study in all the villages. The RRA tools in this study were modifications of tools cited in Sontheimer *et. al.*, 1999; Chambers R, 1992; DFID, 1998 and FAO 1994.

The overall aim of this study was to investigate the pattern and structure of rural livelihoods and the institutions that govern access to and control natural resources in three rural villages. This section discusses the techniques that were used during the study to gather information required to achieve the research objectives of the study. For each research objective, a set of RRA methods and tools were identified and a brief explanation of how the tools were used is provided. For each technique, there was an accompanying list of prepared key questions that were to be answered while using that technique. These questions were useful in guiding both the discussion and the progress of the activity.

2.3.1. Research Objective 1. Resource Description and Assessment

The first objective was concerned with identifying the physical aspects of each of the three villages and the principal resources that are found there. This includes an understanding of how villagers define their territory, the identification of territorial boundaries and various micro-ecological zones, kinds of resources that exist in the territory and various tenure niches such as holdings (individual or household farming operations, commons (managed by a group) and reserves (protected by the government) (FAO, 1994).

Two techniques were used in each village to achieve this objective: The participatory map (the village social and resources map) and the transect walks.

2.3.1.1. The Village Social and Resource Map

This technique uses a map that is drawn by the villagers to show the social structures, institutions and natural resources found in the area. The map provides information that reveals local perceptions of boundaries, resource availability and distribution (FAO, 1994). It elicits information around the social and economic differences between the households in the community (Sontheimer *et al.*, 1999). It is a good tool to start the whole study with; as it may be used as an ice-breaking exercise while at the same time providing an overall orientation to the features of the village and its resources. Mapping exercises also provide useful historical information about the village (FAO, 1994).

Participants were asked to draw the boundaries of the village. They were then asked to draw the existing infrastructure such as roads, households, important buildings, (churches, schools, shops, etc.), water sites, rivers, agricultural lands, forest lands, grazing areas and other special places in the village. Participants were allowed to draw the maps with minimal interruption except in instances where further useful information outlined in the key questions was required or when the drawing stopped.

When the villagers were done with the resource map, they were asked to indicate the relative social status of families by using quantity markers to mark compounds on the map. Beans were used in the marking exercise. The number of beans on a compound represented the overall wealth of the compound.

After the map had been drawn, it was copied; with as much detail as possible, onto a sheet of paper.

Key questions to be answered during the activity:

1. What are the names of the neighbouring villages?
2. How many households are found in the village?
3. Is the number of households growing or shrinking and why?
4. What are the social structures and institutions found in the village?

5. Which (on the map) are female-headed households?
6. What resources are abundant?
7. What resources are scarce?
8. Does everyone have equal access to land?
9. Do women have access to land?
10. Do the poor have access to land?
11. Who makes decision on land allocation?
12. Where do people go to collect water?
13. Who collects water?
14. Where do people go to collect firewood?
15. Where do livestock graze?
16. What kind of development activity is carried out by the whole community?
17. Are there regular community gatherings?
18. Which resources do you have the problem with?

2.3.1.2. Transect Walks

The purpose of the transect walks is to find how the different land use categories are distributed in the landscape of the villages. They provide opportunities to look at changes in vegetation, soils, settlement, economic activities, administrative centres, livestock pastures and other social centres as we moved from one point to another. Transects offers an opportunity to get an idea of the diverse micro-ecological zones found in the territory.

The route of the walk in each village was chosen based on the participatory map drawn in the previous activity and with the advice of the villagers taking part in the walks. Routes that would go through the widest variety of micro-ecological zones, (including any forested areas, lowlands, grasslands and fields), were chosen.

The transects were conducted on foot with a group of informants. Questions were probed around what was seen during the walk and all useful information was noted as the transect proceeded to be later transcribed onto paper.

2.3.2. Research Objective 2.: The Utilisation of Resources

The activities in this section were conducted to identify how natural resources are used in the community. Information was gathered about what kinds of resources are used (or not used), how and for what purpose they are used for and who the users are. This information is important for identifying the resources that could be exploited and for understanding where there are constraints in resource use (FAO, 1994).

The activities address the accessibility of the resource by various members of the community. Characteristics such as gender, social or economic standing and other factors that affect people's access to resources in the community are identified (FAO, 1994).

The tools are also used to determine how much work people do at different times of the year and how their revenues change in different periods.

Two techniques were used to gather information around resource uses in the community, viz., resources cards and seasonal calendars.

2.3.2.1. Resources Cards

The resource cards activity is aimed at finding out who in the community uses what resource. This enables one to find out about the differences between men and women in use and control over natural resources.

Participants were asked to list resources accessible to people in the village, including those mentioned during the resource mapping activity. The names of the resources were written on cards.

To determine who uses the resources, four pictures, one of a man, one of a woman, one of both a man and a woman, and one of a small boy and a girl were introduced. A picture was pasted on a sheet of paper and participants were asked to place cards of resources

that are used by the subject shown in the picture. This was done for all the four pictures and the results were recorded.

To determine who controls the resource four pictures were used, one of a woman, one of a man, one showing a leader (Chief) and the last representing the state. Participants were asked to place resource cards on a sheet of a paper as each of the four pictures were placed on the paper to indicate who they think has control, ownership, or decision making power over the resource.

Key questions to be answered:

1. What are the resources that women use?
2. What are the resources that men use?
3. What resource do both sexes use?
4. Who controls the use of these resources?
5. Who makes decisions about how resources are used?

2.3.2.2. Seasonal Calendars

Seasonal calendars are used to explore changes that take place over a period of a year. In this study, calendars were used to learn about livelihoods in the village and how they change at different times of the year. They were used to show the seasonality of agricultural and non-agricultural workloads, resources availability, gender-specific income and expenditure and forage (Sontheimer *et al.*, 1999).

Seasonal calendars are also useful in counteracting time biases because they are used to investigate what happens in different seasons irrespective of when the study was conducted (FAO, 1994).

The calendars were drawn on a large sheet of paper. Seasons of the year were written along the X-axis and to cater for the illiterate, diagrams indicating seasons were drawn. These were then subdivided into months of the year. Participants were first asked to indicate when major community activities such as the planting and harvesting of the

crops are carried out throughout the year. Questions about a variety of livelihoods, available resources and their seasonality throughout the year were asked. The seasonality of the following topics were covered: rainfall, livestock forage availability, natural resources (mentioned during the resource card activity), agricultural work carried out by women (including the types of work), non-agricultural work carried out by women (types of work), agricultural work carried out by men and non-agricultural work carried out by men.

Key questions to be answered:

1. What are the busiest months of the year?
2. At what time of the year is food scarce?
3. How does income vary over the year for men and women?
4. How does expenditure vary over the year for men and women?
5. How does rainfall vary over the year?
6. How does water availability for human consumption vary over the year?
7. How does water availability for livestock vary over the year?
8. How does livestock forage availability vary over the year?
9. When do women carry out most agricultural work?
10. When do men carry out most agricultural work?
11. When do women carry out most non-agricultural work?
12. When do men carry out most non-agricultural work?

2.3.3. Objective 3. Management of Resources: Tenurial and Institutional Issues

2.3.3.1. Venn Diagrams on Institutions in the Village

This activity is used to find out what institutions, organizations, bodies, groups, individuals are found in each village. It is used to find out from the local people's view, how important each of these institutions are and who participates in each of these groups. The diagrams also indicate how the different institutions relate to each other in terms of cooperation in village matters.

Participants were asked to list all local institutions; groups and organisations operating in the village. The participants wrote these on cards either as a name or as distinctive symbols agreed to. These were used during the drawing of Venn diagram circles. The bigger the circle the more important or influential the organization. The closeness or even the overlapping of circles indicated relations between the villagers and among the institutions themselves. After the activity and discussions, the diagrams were copied onto paper.

Table 2.1 Degree of cooperation as represented by sizes and proximity of circles.

Largely distanced circles	-	no or little contact or cooperation
Circles close to each other	-	only loose contact exist
Touching circles	-	some cooperation
Overlapping circles	-	close cooperation

Key question to be answered during the activity:

1. Which organisations/institutions/bodies are working within the community?
2. Which institution is the most important and why?
3. Which institution is the least important and why?
4. Which institutions are organised along:
 - land and environmental issues (water, grazing, arable land, etc.)
 - economic issues (agriculture, livestock etc.)
 - social issues (education, health, tradition, sport etc.)
 - political issues (political organizations)
5. Who makes the most important decisions?
6. Which organizations work together?
7. Are there groups that are meant for women or men only?

2.3.4. Objective 4. What are the Resources Worth?

2.3.4.1. Valuation of Resources

Local level valuation is an approach that primarily determines the direct-use values of natural resources to households (Shackleton *et al.*, 1999). Direct-use value of a resource or good is the value obtained from using the resource in consumptively or non-consumptively manner. Consumptive use applies to resources that are harvested and used by households or traded in their natural state or processed form in the market places. Non-consumptive us include tourism, recreation and conservation (Balance *et al.*, 1998).

Key informant interviews with producers, vendors and builders, provide accurate information on amounts of goods that are used or produced, time taken to produce or harvest a good, costs involved and prices. A quantitative household survey supplements information obtained from key informants interviews and ensures that information on the proportion of households using or producing a good is known. Households' surveys also provide a measure of variation around the various amounts and values obtained (Shackleton *et al.*, 1999).

The direct-use value of a resource is determined by multiplying the amount of a resource, good or product used per person, per household, per village by the most localised price that local villagers pay when trading in the resource or product. Cost in terms of inputs and labour are accounted for and subtracted from the gross price to obtain the value of the resource itself. For non-traded resources or products, indirect values are calculated based on the time spent collecting, preparing and processing it (Shackleton *et al.*, 1999).

While there are different ways of obtaining information on the value of resources, three methods, market analysis, household surveys and key informant interviews were used in this study.

2.3.4.1. Semi-structured Interviews: Household Surveys

Households to be surveyed were identified randomly by allocating numbers to household indicated in the resource maps. In cases where a key informant household was identified, a replacement was made. The same was done to households that were not willing to cooperate in the study.

A checklist of all products used by households was compiled from interviews and activities, such as resource cards and seasonal calendars, conducted with the villagers in previous sessions. The list was then reduced to a limited range of frequently used resources in each village. Products or resources consumed at very low levels were recorded but not evaluated.

Information about quantities of marketed products per year was collected from the sample households using household interviews. Interviews were in the form of a prepared questionnaire and findings entered on the data sheets.

As household interviews offer an opportunity of talking in a more relaxed one-to-one basis with participants than when they are in a workshop environment, questions about daily activity charts and income and expenditure matrix activities were also included in the survey. Daily activity charts were used to learn about the different daily activities carried out by men and women.

2.3.4.2. Key-informant Interviews (case studies)

During the early stages of the fieldwork in each village, potential key informants were identified. These individuals were interviewed separately. All the interviews were informal and structured around a set of prepared questions. Interviews explored product collection, processing, and marketing. Costs and returns at each processing stage were identified in each case. Market demands and market competition were also assessed.

Interviews were also conducted with elderly people in order to establish changes in the resources availability and trade. The opportunity was also used in each village to determine the historical timelines of the village.

2.3.4.3. Market Analysis

Lastly, markets and other areas where resources and forest products are sold were identified and visited. Informal interviews were conducted with traders. Origin and cost prices of products were identified. This also helped to explore the nature of possible market imperfections.

2.4. Data collection

Most of the information collected during the fieldwork was contained in audiotapes backed by written notes. Tapes were transcribed and translated. Case studies with key informants were translated and rearranged into logical essays. Where possible, tape and written information was backed by photographs of consenting villagers. Photographs were also used to capture maps and other results of RRA tools constructed by the villagers.

Chapter 3. Results and Discussion

3.1 Introduction

The results that are presented in this chapter have been drawn from all the PRA tools and activities that were described in the previous chapter. PRA tools and activities were carried out with community members who were able to attend workshops organised by village community leaders. Community cooperation during the organised workshops varied from village to village.

In the first section of the chapter, the processes and activities as they took place in the three villages are described. This is followed by the description and assessment of each of the villages, including a short history and the description of people and culture in the village. The institutions that are involved and their impact on community life in the village is outlined. The last part of the chapter includes all the data about rural livelihoods in the three villages that was collected during the study.

3.1.1. Fieldwork Process in Bend-Mutale

The first village that was visited was Bend-Mutale. Initially a single workshop was planned for the village but two were conducted instead. The first was held on a Sunday morning after the weekly community gathering had ended. Although the villagers were informed about the workshops, some of them left but enough individuals remained, 22 women, 13 men and 24 girls and boys. The workshop was held in an open area in the headman's kraal. The elderly, particularly men, were, at first, not keen to participate in the activities but later joined in as the process continued with the youth who were more enthusiastic. During this workshop the village social and resource maps were drawn. These were followed by resources cards and seasonal calendar activities that were well liked by participants. 'Venn diagrams on institutions in the village' was abandoned as the participants' interest waned.

This activity was later conducted during a meeting organised by the agricultural extension officer for women who do voluntarily work at the communally owned citrus field. This meeting offered a good opportunity to elicit more information about the relationships among the various institutions in the village away from the presence of village elders and local civic organisation leaders.

Transect walks were conducted that afternoon, with a group of young men and several young boys who volunteered. Among the participants were young men who were cattle herders, who had good knowledge of indigenous plant species and their uses. The transect walk culminated in the collection of cattle from the forest as they were to be dipped the following day.

Four key informants were interviewed in Bend-Mutale. The first was a carpenter and drum-carver who plies his trade from his house. The second was a woman who manufactures sleeping-mats, food and washing baskets from palm leaves. The third informant, an elderly man, manufactures food trays and baskets, cooking spoons, whisks, and handles of hoes and axes. The fourth key informant was a traditional healer who took us on an informative walk into the forest. His knowledge of medicinal plants was extensive. Note taking was however restricted to pen and paper as he was not comfortable with the tape recorder.

Household interviews were conducted over the 12 subsequent days that were spent in the village. These were successful although uncooperative behaviour was encountered in three of the village households. Households where household-heads, i.e. father or mother, were not available during the 12 days of the study were not interviewed (Table 3.1).

Table 3.1. Household sampling procedure used in the study three villages in the Northern Province. One household in the village may consist of several families staying together in the same plot.

	Villages		
	Bend-Mutale	Ha-Nkotzwi	Musunda
No of households	95	21	88
Initial random sample	32	21	27
Empty households	5	5	2
Uncooperative households	3	1	2
No of households interviewed	24	15	23
% of households interviewed in a village	25	71*	26

* % of households interviewed in Ha-Nkotzwi is higher than others because 15 households were interviewed from a total of 22 households.

3.1.2. Fieldwork Process in Ha-Nkotzwi

In Ha-Nkotzwi, the meeting was well organised by the local prince-in-waiting. The community was cooperative and all workshop activities were conducted in a single day. There were, as in Bend-Mutale, more women than men, 23 women, 5 men and 6 children.

A transect walk was difficult because of the dense woodland around the village. The route that was selected followed a cattle trail. Not much information about plant identification and usage was collected. The main problem was the lack of experienced cattle herders and older people in the group.

Two key-informants were interviewed. The first was a utensils manufacturer who is also a cattle herder and the second was a woman who specialises in decorating walls and huts. Both informants were not willing to be tape-recorded nor photographed.

Household interviews in the village were successful. Only one household head was not willing to be interviewed as he felt it was time consuming (Table 3.1).

A problem was experienced concerning the definition of a household in the village. Some of the households in the village consisted of more than one family. It is common to find a household with three brothers staying with their families on one plot and jointly owning a herd of cattle. Such households were regarded as one household in the study. That is why there were only 21 households recorded for Ha-Nkotchwi village. Household interviews were conducted in four days.

3.1.3. Fieldwork Process in Musunda

Workshops in Musunda were carried out successfully with the help of the local extension officer and the leader of the village civic organisation. The first was held at the headman's kraal and the second at the local citrus orchard. The first workshop was well attended by 21 women, 19 men and 26 young girls and boys. The attendance was partly increased by the fact that the meeting was linked to the allocation of new cultivating plots in the citrus orchard. The community participated well in all the activities and were particularly interested in the drawing of the village map. The resource cards and seasonal calendars activities drew heated arguments between the men and women until some men left as they felt offended by the women's views. The participation of children was limited as they were given few opportunities to talk during the workshops.

The second workshop was held at a meeting organised by the extension officer, with cattle-owners and citrus orchard labourers. Because of the Bend-Mutale experience, institutional Venn diagram activities were conducted during this workshop. The workshop also provided an opportunity to identify cattle owners for further interview.

Two transect walks were conducted with the civic leader and several other young men. The walks were dominated by stories of poaching experiences and adventures into the nearby National Park.

Household and key informant interviews were conducted over a period of nine days in the village. Some of the householders interviewed were under the impression that the

survey had been initiated by the local tribal council or local government and were reluctant to participate until the local civic leader explained our purpose. Two crafts people were interviewed for product evaluation and market analysis. The traditional healer, a woman who specialises in child medicine, was also interviewed. Information about the history of the village was obtained from the elderly grandmother of the civic leader and another elderly man who was part of the first group of villagers who had been removed from the Park.

3.2. Introduction to the Villages

3.2.1. Bend-Mutale Village

3.2.1.1. History of the Village

The name Bend-Mutale originated from surveyors who drew up boundaries of the Kruger National Park and could not pronounce the Tshivenda name of the village. The name refers to the sharp bend that the Mutale river follows as it passes next to the village. The original name of the village is Madavhila. The people in Bend-Mutale originated from former villages that were within the Kruger National Park (KNP). They originated from areas next to the Limpopo River such as Tshiadze, Tshidzumbulukwe and Mavhiligwe next to Makuleke. They were removed from within the present Kruger National Park around the 1930s and settled in the area called Mavhilani along the Vhembe River. They were then forcibly removed again in 1969 by the military to the present village to make way for a military zone along the border with Zimbabwe.

Bend-Mutale is one of the five villages that fall under the Mutele Tribal Council, under the leadership of Khosi (chief) Vho-Mutele. The other four are Ha-Mutele, Tshikuyu, Dovho and Bileni. The headmanship of the village belongs to the Siphuga family. The present headman, Gota Vho-Luswielo Siphuga is the third generation in the family line. The first headman of the community was Gota Vho-Petrus Siphuga. The Siphuga family

has a paternal relationship with the Mutele chiefs' family, which is why they were given the present land after they were removed from within the KNP.

Towards the late 1970s, the present Bend-Mutale villagers were prohibited by the military from building houses across the present R525 road. The area across the road was left for cultivation and livestock production. Military bases were later established in the area, further limited the accessibility of the villagers to their original fields. Several villagers left the area and others were given alternative land to cultivate.

The village land was further reduced by the establishment of the Makuya Park that was established by the government of the former apartheid "Bantustan" of Venda. The Park consisted of a narrow strip between the KNP fence and the residential settlements. This Park contained animals that overflowed from the KNP.

3.2.1.2. Description of Bend-Mutale Village

The village is made up of 95 households that stretch from the Mutale River to the R525 road leading into the KNP (see Appendix A Figure 4.1. and Appendix B Figure 4.4.). It is an unplanned village with plots that are scattered among trees throughout the many rocky slopes of the village. The sizes and shapes of the plots are highly irregular and some are isolated from others. Dwelling structures are mainly thatched huts with brown soil-plastered walls. Two households had well planned multi-roomed houses. Most of the homesteads are not fenced. Fences around fenced homesteads are mainly made of wire attached to crude untreated poles. Few households had wall enclosures that are common in the Venda culture. Live-fences are common in older households and around kraals.

The infrastructure of the village is poor. The households are serviced by a network of rocky poorly maintained roads. A primary school built in 1992 lies to the south of the headman's kraal. Villagers buy households needs from one of the three shops and an informal shop (spaza). There are also two church buildings in the village. The people in the village collect clean treated water from three water taps that are supplied by two tanks

raised on a platform close to the main road. The tanks are filled by underground water pumped by an engine situated to the east of the village. There is also a borehole close to the playground but it is not functional due to lack of maintenance.

A bus that arrives at 5:30 pm from Thohoyandou provides public transport to and from the village. It leaves the village for Thohoyandou at 4.30am. There is no taxi service in the village and donkey carts provide the best means of local transport. The nearest government buildings are 16km away in Masisi, where there are larger shops, a police station, a health centre, and magistrate offices that incorporate government's Agriculture and Home Affairs departments. Donkey carts are used to cover this distance. They are also used for many kinds of chores including collecting water, firewood and transporting harvested crops.

The village crop fields are found within the forest that surrounds the village. Most of the fields are across the road, north of the village while few are located a short distance to the west of the village. A group of cattle kraals is situated between the fields and the fields to the west of the village.

The headman's two fields are found within the village. The smaller of the two fields is located in the eastern side of the village and the bigger field is opposite the sports-ground. Part of the field has been given to the community to use as a citrus orchard.

3.2.1.3. Description of the Village Population

The people in the village are predominantly Venda speaking, with a few Shangaan families. Four Shona families came from Zimbabwe and were naturalised through marriages with the locals. There is a close relationship between the villagers and Zimbabweans from the villages across the border. As a result, the culture in the village has strong Shona and Shangaan influences. This is reflected by the type of music played and the kind of dances performed in the village.

Most of the village adults are illiterate. Majority are cattle owners and cattle herders who earn their living by taking care of cattle that belong to outsiders. Two people were employed in Tshikondeni mine, one was a policeman and three were night watchmen in Masisi.

Education among the youth is poor. There is only a primary school in the village 16km away. The majority of the youth drop out of school before the completion of grade 7. Reasons for this range from poverty to the need to take care of livestock.

3.2.2. Ha-Nkotchwi Village

3.2.2.1. History of the Village

Ha-Nkotchwi villagers came originally from an area called Lumano, at the intersection of the Luvuvhu and Mutale River in the KNP. Lumano was separated from Ha-Makuleka by the Luvuvhu River. A big settlement area consisted mainly of Shangaan speaking people. They were removed from the area and came to settle in a place called Mashikavha in the 1930s. Those staying at Mashikavha were further moved due to the forced removals in 1969 under the Group Areas Act of the previous South African government. Other families moved on to areas such as Ntlhabeni and Sanari, and as far as Malamulele and Giyani in the former Gazankulu homeland

Gota (Headman) Vho-Hlongwane resisted the move as he had many livestock and was protected by the then Khosi (Chief) Makuya who was the local chief. He was then given land just next to the KNP along the Mutale River. The village moved to the present Ha-Nkotchwi village when the fence of the Makuya Park was erected in the 1980s.

Ha-Nkotchwi is a village governed by the Makuya Tribal Council under the Khosi Vho-Makuya. The name of the village was derived from Nkotchwi, the name that was given to the first headmen Gota Vho-Hlongwane of Lumano, who died before the village was

moved to Mashikavha. The name was passed down to the next headmen, his son and the village was then known as the place where Nkotzwi stays, hence Ha-Nkotzwi.

3.2.2.2. Description of the Village

The village consists of twenty-one homesteads. Seventeen of the homesteads are arranged in two straight lines and the other four are found across the valley toward the East next to the Makuya Park fence (see Appendix A Figure 4.2.). The house structures are predominantly thatched huts and a few rectangular structures that are beautifully painted with bright colours. The dwellings in most homesteads are connected by walls to form an enclosed open area that acts as a kitchen during warm evenings.

The village has only one road that connects the village to Tshikondeni mine. The shorter route for the people to go out of the village is across a suspension bridge over the Mutale River into Bend-Mutale. The road deteriorates badly after the rains.

There are no schools, shops, and other social buildings in the village. Children attend primary school in Bend-Mutale. Regular church services are held in one of the villagers homestead. There is no piped water and water is collected from a natural fountain, a short distance to the East of the village.

Crop fields are situated between the households and the river. Cattle kraals are scattered around the woodland that surrounds the village. The woodland around the village is much denser than across the river in Bend-Mutale, providing good cover for game including buffalo and elephants that break through the Park fences.

3.2.2.3. Description of the Community.

People of Ha-Nkotzwi are of Shangaan origin but are able to speak Tshivenda fluently. There is little outside cultural influence in the village. They still perform their Shangaan

traditional dances and their dwellings and walls are painted in the Shangaan tradition with brightly coloured lime.

A homestead in Ha-Nkotchwi village is much more than an extended family. In a single homestead there may be three to four families living in one big fenced-in area. These are usually male siblings who share a herd of cattle and cultivate from the same fields. The women from the different families may share or have different kitchens. Most of the homesteads in the village are organised in this way.

The villagers are religious and the majority of the households belong to the African Apostolic Faith Mission. They claim to be totally against the use of traditional or western medicine and healing, believing in the power of prayer instead.

Formal employment in the village is non-existent and livestock herding for outsiders is common. At the time of the study, only one young man had matriculated and five other youth were in the secondary school. Schooling is disturbed during rainy days as the river overflows and the suspension bridge is submerged, making it impossible to cross. All young children in the village are forced by the headman of the village to go to school.

3.2.3. Musunda Village

3.2.3.1. History of the Village

The Musunda village community consists mainly of people who were formerly staying in the present KNP, living across the Luvuvhu River next to the Magovhani River. They used to be crop farmers who cultivated and sold sorghum and maize to the people inland, mainly to the neighbouring Makuya people. They did not use money but bartered cattle and goats. As the numbers of cattle increased, they moved them to forage lands next to the former Makuya village, south of the present Makuya village. This was to avoid the mixing of their cattle with buffalo (for the safety of herders and to avoid diseases) and because of increased lion attacks on cattle.

The villagers were not forcibly removed from the KNP. They were people who had already started moving out of the area towards the present Musunda village. When they were informed about the intentions to establish a wildlife park they did not resist and simply moved to the area close to the hills to the South of the present village. The first two families to settle in the village were the Netshipale and Makahane families. The villagers were later moved to the present settlement area in the middle 1970s when agricultural extension officers started drawing present plots and pastoral camps.

Musunda village falls under the chieftainship of Chief Vho-Makuya. The first headman of the Village was Headman Vho-Nemudzivhadi. After he passed away, Vho-Philemon Munzhedzi Makahane was enthroned as a headman while he was still in Magovhani. There was also a close relationship between the Makuya chief's family and the Makahane family. Headman Vho-Makahane's sister was married to the royal Makuya family and is the great-grandmother to the present Chief Vho-Makuya.

After the death of Headman Vho-Makahane, his son was chosen to be the next headman. He however declined as he did not have a reference book (Dompas)³. The headmanship was given to Headman Vho-Muvhali who is the father to the present headman Vho-Afrika Muvhali Kwindi. The present headman was enthroned in 1983.

3.2.3.2. Description of Musunda Village

Musunda has 88 households that are planned around a main road that passes through the middle of the village towards one of the several Makuya Park gates (see Appendix A Figure 4.3.). The dwellings are dominantly thatched huts although several households have modern rectangular houses. The households are grouped into blocks of four (North of the road) and blocks of two (South of the road) surrounded by well-kept roads. There are also new households that are being erected next to the entrance into the village, further increasing the size of the village.

³ According to apartheid Group areas Act legislation, all non-white people of South Africa were required to carry identity documents at all times. Failure to produce the document on demand resulted in an arrest and a prison sentence.

Places of importance in the village include a primary school, a closed shop and a spaza (informal shop), a graveyard and a sports-ground. Close to the entrance to the village is a quarantine camp that controls animal movement in and out of the village.

Water for household use is collected from a tank that is filled with a pump. When the machine is not working, as it was the case during the course of this study, water is collected from a natural spring. The tank has replaced an old and dry borehole situated close to the new engine room.

Modern transport in the village is non-existent. There are three bus services from Sibasa to Masisi that pass along the main road. Residents have to walk to and from the main road. Most of the transportation in the village is done by donkey-carts.

Large crop fields are found on the northern side of the village between the upper road and the Govhabenzu River. To the East of the village next to the Khongode river is a five ha citrus orchard. The orchard is irrigated by water pumped into a system by a pump situated close-by.

The two rivers that run through the village, the Govhabenzu River to the North of the village and the Khongode River to the South-east of the village, join together and form a tributary to the Luvuvhu river which flows past the southern side of the village. The village is completely separated from the Luvuvhu River by the Makuya Park fence.

The woodland around the village is dominated by Mopane shrubveld. The density of the forest increases from the West to the East of the village. The western end of the village is drier and rocky, and dominated by shrubs and few stunted trees (see Appendix B Figure 4.5.). The eastern side is also rocky but has well drained soils that support woodland dominated by *Sclerocarya birrea*, *Adansonia digitata* and *Colophospermum mopane* trees interspersed with bushy shrubs.

3.2.3.3. Description of the Musunda Community

The community of Musunda is predominantly Venda speaking. Compared with the communities in the other two study villages, the Musunda community has been little influenced by other tribal cultures, the people still observing most of their cultural beliefs and practices. For example, there was an initiation school for young girls and boys, before puberty, (Musevhetho), during the data

collection process. The majority of the households in the community claim to be descendents of the Makahane clan whose burial place was recently discovered in the northern section of the Kruger National Park. The community is proud to be associated with that finding.

The majority of the youth are high school dropouts who left school because of a variety of reasons and excuses. There is no high school in the village and learners have to walk to Makuya village to the nearest high school.

3.2.4. Analysis

The removal of the three communities from within the KNP is just one of the many examples of classic top-down approach that has characterised wildlife management throughout the African continent (IIED, 1994). The approach was unsympathetic to the needs of local people. The provision of local livelihoods were regarded as less important than ensuring that the wildlife resources are conserved for future generations and the world as a whole (Brandon and Wells, 1992).

The removal of communities from within the KNP had adverse social impacts on the lives of local people. Their traditional ways of life and their relationship with land was disrupted. Sacred places and ancestral burial grounds were lost. Ecologically, the people and their livestock were moved into environments to which they were poorly adapted. People were denied the right to continue cultivating their customary fields and refused access to the resources that are necessary for their survival. Their crops and livestock suffer depredations by wild animals, which local people have little power to control for fear of anti-poaching legislation. The Masai in East Africa went through the same experience documented by West and Brechin (1991).

Communities, that were once large, stable and self-supportive, were divided and relocated to different areas. The social fibre that united them was broken and with it went the strength of numbers that empowers rural communities. As a result, the 'new' villages are poor, have small population numbers, and therefore struggle to be self-reliant.

3.3. Institutions that Influence Life in the Three Villages

3.3.1. Institutions in the villages

The Venn diagram activity used in eliciting information on around this topic revealed that there are similar types of institutions that influence the quality of life within communities in the study villages. Institutions that were identified in all the villages included tribal authorities, headmen, local village-councils (khoros), local government, agricultural extension officers (vhalimisi), civic organisations (except Ha-Nkotzwi), the Tshikondeni mine, local development board, churches and schools (Appendix C Figures 4.6., 4.7. and 4.8.). The communities differed in the degree to which these institutions affect the community and how they are structured.

Households in the communities are divided into wards (mivhundu) that are headed by ward leaders, (indunas or vhakoma). Indunas together with other nominated ward elders constitute a village council. The village council has an executive committee which consist of the chairperson, the secretary, the treasure and their deputies. The organisational structure shown in Fig. 3.1 is common to all three villages, except for minor differences.

In Bend-Mutale and Musunda villages, there are civic organisations, mainly composed of the younger members of the community. These are structured like the village councils but they include more wards. In Musunda, civic executive council members are automatically members of the village council. In Bend-Mutale, they have to be nominated like other residents. Civic organisations are organised around political parties and hence they are closer to the local government than tribal authorities that, it is claimed, are autocratic.

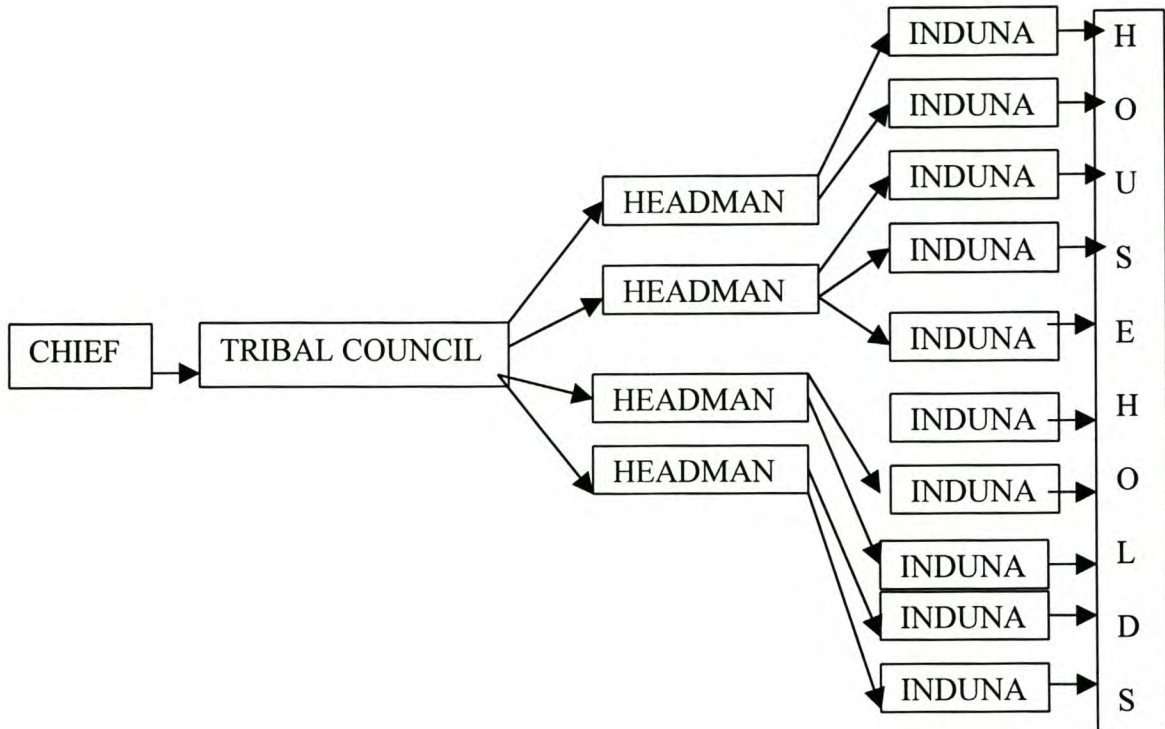


Figure 3.1. Traditional governance structure in the three study villages. The number of Indunas and Headmen in the diagram is merely illustrative.

The village council presides over weekly gatherings that all households are compelled to attend. Failure to attend village gatherings results in a fine, which may lead to forfeiture of privileges such as owning crop fields. During these gatherings, cases of conflicts within the community are tried and settled by fines or other forms of punishment. Trial is conducted by the executive committee of the village council with the participation of the residents. Judgement and sentence are passed by members of the executive committee who will then report to the headman who may overrule or sustain the judgement and increase or reduce the passed sentence. Severe cases that cannot be solved by the authority of the village council are handed over to the tribal council, which is notorious for harsh sentences that include banishing a household from the chieftdom. Serious cases such as murder, rape and grievous assault are reported to the South African Police Services.

In Ha-Nkotzwi, there is a smooth running of community affairs from the homesteads up to the tribal authority. The residents also claimed a close relationship between them and

the tribal council. They attributed the good relations with the tribal authority to their headman's loyalty to the chief.

In Bend-Mutale, there are two opposing institutions: the civic organisation of younger people that are aligned with the Local Government and the Headman who is under the control of the tribal authority and the Chief. This results in conflicts within the community as the village council finds itself between the headman and the civic organisation or indirectly between the Local Government and the Chief. In Musunda, however this situation has been avoided by joining both bodies, so that members of the executive council of the civic organisation are also members of the local council. Although the civic structures holds meetings during the week, they always report during the village gatherings.

The study revealed that villagers in the study area regard the Local Government as an unsympathetic entity. Residents in Ha-Nkotzwi also stated that they have never been visited by a single top government official since they moved to the present settlement area. Residents in Bend-Mutale felt that the circle representing the Local Government should not even appear in the Venn diagram. Members of civic organisations in Musunda and Bend-Mutale however felt that the role of the Local Government is improving and residents would soon see the results. The remarks seemed true only for Musunda village.

Communities also felt that the National Parks Board or specifically the Kruger National Park also lacked concern. Residents in the three villages complain about several problems including lack of employment, damage caused by animals in the village, lack of access to their sacred sites, as well as lack of access to the resources that they utilised before, such as the palm stands and fishing sites along the Luvuvhu River.

Agricultural extension officers in the region work closely with all the villagers. They have several projects that they run with the communities, and are commended for addressing community problems on time. They assist communities with their crops and

livestock at all times and their popularity in the communities can be judged by the crowds that attend their meetings.

Agricultural extension officers are working closely with women organisations in Bend-Mutale and Musunda. They organised funding through the development board that operates in the area, for different projects that women are involved in. The biggest project in both villages is the establishment of the citrus orchard. The project is being funded by the Social Responsibility Department from Tshikondeni mine. Funding provided a water pump and irrigation pipes for the orchard in Musunda and a dam filled with water pumped from the river was built in Bend-Mutale.

The role of the church in Ha-Nkotzwi was regarded as key by villagers who claim the church brings peace among the residents. They also go to Zimbabwe on a pilgrimage annually and they claim that they do not use any medicine except prayer. The role of churches in the other two villages was not regarded as part of the institutions that help people. Musunda village used to have a church building before, but since its collapse a new one has not been built.

The role of schools was regarded as important by all the villagers, who felt education was good for their children. Residents in Bend-Mutale are planning to start adult literacy classes in the local school. Residents in all the villages also expressed a need to reduce the distances that learners have to travel everyday to school.

3.3.2. Analysis

The influence of institutions that are operating in the villages is varied and mostly uncoordinated. Most of the institutions that, under normal circumstances, are expected to provide assistance in terms of the provision of livelihoods are failing. Much as the villages are under well-organised hierarchy of traditional governance, external input in terms of social capital is necessary. Apart from the management of natural resources, the role of traditional and modern governing institutions in the provision of rural livelihoods

is quite limited. There is little that headmen and tribal chiefs can offer in terms of financial, human and physical capital assets that the community need to secure their livelihoods. During the study, some of the capital assets of the three communities were being addressed by government departments, specifically the Department of Agriculture and the Department of Welfare. This is mainly because the communities are dependent on crops and livestock for most of their livelihoods. The work of extension officers in the three villages is an example of assistance that villagers need from the Government. The Department of Welfare provides financial capital asset in the form of welfare pensions for the disabled and the elderly.

The local government and other governmental institutions have had little or insignificant role in the provision of livelihoods of the three communities. The physical and human capital assets of the communities have not been developed. The poor infrastructure in the villages and lack of schools in the area has led to low levels of education in the communities. This results in the increase of unemployment and poverty levels in all the three villages.

Institutions such as Tshikondeni Coal Mine and the KNP are doing little in terms of their social responsibility. The collaboration between the mine and the local Development Board is commendable but more can be done to raise the living standards of the local people on whose land the mine is located. An insignificant number of villagers from the three communities have been employed by the mine. The KNP's influence in the three communities is little or non-existent. Out of the three communities, only two people were recorded to have been employed as game rangers. The communities have no links with the Park even when they are just staying next to the Park fences. Employment of labour should have been directed at the local people, who have sufficient knowledge of the area and its ecological dynamics, before people from distant places

3.4. The Utilisation of Resources in the Three Villages

From the PRA activities and tools that were conducted in the three villages, several ways in which community members in the three villages utilise forest-based natural resources have been identified. These include food and drinks, fuelwood, livestock forage, construction materials, fencing, medicines for both humans and livestock, and in the manufacturing of artefacts and household utensils (Table 3.5).

3.4.1. Utilisation of Plant-based Resources

3.4.1.1. Fuelwood

Woodland is predominantly used in all three villages for fuelwood, as the villages are not electrified. Candles and paraffin lamps are used for lighting but fuelwood is used for cooking and the provision of warmth. Firewood is used in the villages in the distillation of beer and alcoholic spirits, for firing building bricks and pottery.

The collection of wood differed from village to village. In Bend-Mutale and Musunda villages, all sections of the community (women, men and children) participate in the collection of wood. In Ha-Nkotchwi, however, only women collect wood. Men and boys collect heavier loads of wood than women do as they use donkey-carts to transport them home while women and girls carry their loads on their heads.

Firewood in the three villages is mainly collected during the months of April to August but smaller loads are collected throughout the year, especially in the beer brewing and pottery industries. Stockpiling of wood is rarely practised as wood is always in abundance in the surrounding woodland. Some households collect firewood for sale to business people who own wood and coal-yards in the urban areas. This is done in Bend-Mutale and Musunda.

Dry deadwood is collected for firewood that is used in normal daily cooking and beer. Live wood is however used in the firing of bricks. In this case, whole trees are felled. Trees such as the *Acacia nigrescens* and *Azelia quanzensis* are used for this purpose.

A variety of plant species is used as firewood. The most commonly used species include *Acacia nigrescens*, *Azelia quanzensis*, *Colophospermum mopane*, *Combretum apiculatum*, *Combretum imberbe* and *Peltophorum africanum*. *Androstachys johnsonii* was mentioned for use as firewood in Bend-Mutale only. The most favourite firewood species was *Colophospermum mopane*.

Although many other plant species apart from the ones mentioned above may be used for firewood, there are plants species that are never used. Their use is regarded as taboo according to cultural customs in both Bend-Mutale and Musunda. The same can be said for Ha-Nkotzwi as none of the trees was mentioned during the study. These are mainly trees that are considered to be valuable medicinal plants, and include *Boscia albitrunca*, *Securidaca longepedunculata*, *Adansonia digitata*, *Xanthorcercis zambesiana* and *Lannea stuhlmanii*.

3.4.1.2. Food

Twenty-one plant species out of the sixty-five named in the whole study were sited as food plants. These were mainly fruit trees and those trees that provide food in the form of tubers. Wild annual vegetables were also collected.

Fruit that is collected in all the three villages includes *Adansonia digitata*, *Berchemia discolor*, *Diospyros mespiliformis*, *Ficus sycomoros*, *Landolphia kirkii*, *Sclerocarya birrea*, *Ziziphus mucronata*, and *Strychnos spinosa*. *Ximania africana* and *Phoenix reticulata* were mentioned as fruit trees in Bend-Mutale only. *Boscia albitrunca* was mentioned together with *Adansonia digitata* as sources of food during droughts and famine. *Acacia robusta* and *Colophospermum mopane* were sited as food plants because they host caterpillars that are regarded as a delicacy by the communities.

Different fruit is collected by different sections of the community. While fruit such as *Sclerocarya birrea* and *Ficus sycomorus* are collected by all sections of the community, fruit such as *Berchemia discolor*, *Diospyros mespiliformis* and *Hexabolus monopetalus* are mainly collected by boys. Fruit collected by women and girls is in most cases brought home for all to consume but fruit collected by boys is mostly consumed in the forest. The fruit collected by communities in the three villages is not sold. Reasons for not selling fruit is that there is plenty in the bush and there are actually no customers for wild fruit even in urban markets.

There are several species of trees and annual herbs that are collected mainly by women and girls from the forest and cultivated fields that are cooked as vegetables. Some of these plants have also been domesticated in fields closer to households. These are usually available immediately after the rains in cultivated field and disturbed grounds. These are included in Table 3.3.

3.4.1.3. Drinks

Sclerocarya birrea, *Hyphaene petersiana* and *Phoenix reclinata* were listed as plants that produce alcoholic drinks that are widely consumed in the region (See Table 3.2). A marula drink (Mukumbi) is prepared by removing the skin of the fruit and putting both the kernel and the flesh of the fruit into a pot. The kernels are later removed and the remaining juice is left to ferment and then consumed later. A drink from both *Hyphaene petersiana* and *Phoenix reticulata* is made of the sap that is collected by cutting off the stem of a juvenile plant. The oozing sap is collected into a big pot, left to ferment, and later consumed.

The drinks that are produced in these villages are mainly for consumption by friends and neighbours. They are rarely sold locally in the village but are sometimes sold to people from other villages.

Table 3.2. A list of commonly used food-plants from the three study villages in the Northern Province.

Plant species	Part used	Food processing
<i>Adansonia digitata</i>	Fruit	Powder around kernels is sucked
		Powder is mixed with maize-meal and cooked
	Roots	Dried and powdered and cooked as or with porridge
	Leaves	Fresh leaves are cooked as vegetables and the decoction fed to infants
<i>Amaranthus hybridus/thunbergii</i> *	Leaves	Vegetable
<i>Berchemia discolor</i>	Fruit	Eaten when yellow ripe
		Ripe fruit crushed and mixed with water to form a paste (Govhole)
<i>Bidens pilosa</i>	Leaves	Vegetable
<i>Cassine transvaalensis</i>	Bark	Cooked to make a drinkable tea
<i>Combretum hereroense</i>	Seeds	Seeds are boiled to make a drinkable tea
<i>Corchorus tridens</i>	Leaves	Vegetable
<i>Cucumis zeyheri</i>	Leaves	Vegetable
<i>Diospyros mespiliformis</i>	Fruit	Eaten when ripe
<i>Ficus sycomoros</i>	Fruit	Eaten when ripe
<i>Hyphaene petersiana</i>	Fruit	Eaten when ripe
	Sap	Used to make an alcoholic drink
<i>Momordica foetida</i>	Leaves	Vegetable
<i>Landolphia kirkii</i>	Fruit	Eaten when ripe
<i>Phoenix reclinata</i>	Fruit	Eaten when ripe
	Sap	Used to make an alcoholic drink
<i>Sclerocarya birrea</i>	Fruit	Eaten when ripe
		Fruit juice used to make an alcoholic drink
		Kernels are crushed to expose edible nuts
<i>Solanum nigrum</i>	Leaves	Vegetable
<i>Strychnos spinosa</i>	Fruit	Eaten when ripe
<i>Ximenia americana</i>	Fruit	Eaten when ripe
<i>Ziziphus mucronata</i>	Fruit	Eaten when ripe
		Dried and pounded into a powder and cooked into porridge

* denotes species that have the same Tshivenda name.

Traditional drinks are prepared by women in all the villages. Men and children may assist in the collection of marula fruit from the forest to households. Men sometimes help in the cutting of palm trees but women carry out the actual preparation.

Other drinks that are not quite as common as those mentioned above are teas that are made from boiling the bark of *Cassine transvaalensis* and the seeds of *Combretum hereroense*. These two drinks were mentioned in Bend Mutale and Musunda villages by elderly people that were interviewed. These teas are however no longer popular as there are better commercial teas available in shops.

3.4.1.4. Livestock Forage

The area in which the three study villages are situated is regarded in the Northern Province as a cattle farming area because of the abundance of nutrition grasses and trees and shrubs that are browsed upon by livestock, mainly cattle. Cattle, goats and donkeys browse on several plant species such as *Acacia gerrardii*, *Azelia quanzensis*, *Androstachys johnsonii*, *Boscia albitrunca*, *Cassia abbreviata*, *Colophospermum mopane*, *Diospyros mespiliformis*, *Maytenus senegalensis* and *Ziziphus mucronata*. These are browsed even when grass is not limiting. They however form good reserve forage during the dry season when other forage is limited. Branches of these plant species are cut down and carried to livestock kraals to feed animals with young and those that have to be milked every morning.

3.4.1.5. Construction and Fencing Materials

The majority of building structures, dwelling huts and storage huts in the three study villages are built of mud-brick walls and thatched roofs. In Bend-Mutale and Ha-Nkotzwi, the old traditional huts and storage huts have walls made of wooden poles. Most are windowless. Doors are dominantly commercial doors that are bought from trading stores in Masisi and Makuya.

The frame of the roof is made of a number of straight poles. The number of poles depends on the size of the hut. These poles are attached to 'mutumeri', a central funnel shaped wooden structure, by ropes (in some cases nails are used). The roof-poles are held together by withes that are tied to each roof pole by ropes. The roof is then placed on the walls of the hut. Grass bundles are neatly arranged and tied by ropes on to the roof frame.

Wood for straight roof and wall poles is harvested from *Androstachys johnsonii* and *Colophospermum mopane*, *Kirkia acuminata*, *Lonchocarpus capassa*. *Androstachys johnsonii* is the most preferred because it is resistant to termite attack. *Colophospermum mopane* is most used because it is readily available. *Sclerocarya birrea* is used to make the central roof pole (mutumeri). Thinner branches of *Androstachys johnsonii* and *Colophospermum mopane* are used as withes and are harvested at the same time with longer roof poles of the same species. Ropes that are used to tie the poles and the withes together are made from barks of *Colophospermum mopane*, *Adansonia digitata* and sometimes they are made from *Acacia gerrardi*, *Acacia robusta* and, *Dichrostachys cinerea*. (See Appendix C).

Grasses that are used for thatching vary from village to village. These were not identified with botanical names during the period of the study. The following species are used for thatching in different villages: Ludzima and Rihlangari, in Bend-Mutale, only Rihlangari in Ha-Nkotzwi, and Tshula, Bunga and Tshilungwa in Musunda. Excess thatch grass that is not used is sold locally in the villages and to other villages. Grass is however not sold in Ha-Nkotzwi village. The building and renovations of building structures is carried out during June to August while grasses are harvested in May and June.

Fencing of households and cultivated field varied from village to village in the study area. Most of the households in Bend-Mutale and Musunda and a few in Ha-Nkotzwi villages were surrounded with barbed wire fences. Poles for the fences were made from *Acacia nigrescens*, *Androstachys johnsonii*, *Bolusanthus speciosus*, *Gardenia volkensii* and *Ziziphus mucronata*. Cultivated fields without wire fences are fenced off during

cultivating season by thorny branches of trees such as *Dichrostachys cinerea*. Cattlekraals are fenced with thick poles from a variety of trees that are interspersed with living tree species.

3.4.1.6. Medicinal Uses.

As mentioned in the previous sections, no medicinal information was recorded in Ha-Nkotzwi, so all the results in this section were obtained from PRA activities in Bend-Mutale and Musunda. Most of the information about traditional medicinal uses was obtained from two traditional healers while some was gathered during discussions with other community members. The validity of the information provided in this section is hard to confirm but the similarity in most of the information provided by the traditional healers was regarded as adequate proof substantiating the information. Thirty-one species were recorded in the two villages and are represented together with their uses in Table 3.3.

The wide use of plant species for traditional purposes was evident during transect walks that were conducted in both Bend-Mutale and Musunda villages. There were trees that were scarred and fresh signs of digging around the bases of the stems were evident. This made it easier to confront the healers about the identity and medicinal use(s) of the plant.

Traditional healers from other areas are allowed to come to Bend-Mutale and Musunda and collect medicinal plants. A charge of twenty Rands⁴ is paid to get a permit. Commercial harvesters and those who harvest without permits are arrested when found and handed to the tribal councils in Mutele and Makuya.

⁴ At the time of writing R9.50 = 1,00 USD.

Table 3.3. Plant species that are used in two of the three study villages in the Northern province. Although some of the preparation processes were discussed with the informants, an undertaking was given that they will not be published in the interest of the trade and the safety of the public. * denotes plant species whose Latin names could not be ascertained.

Plant species	Medicinal uses
<i>Acacia gerrardii</i>	Bind splints around broken limbs and treats eyesores in livestock
<i>Acacia nigrescens</i>	Used in the protection of households against evil powers
<i>Acacia robusta</i>	Roots used to treat body sores.
<i>Adansonia digitata</i>	Roots and bark dried and powdered to feed infants with low birth weight and dysentery. Leaf infusion used against mosquito bites.
<i>Azelia quanzensis</i>	Treat bilharzia and sore eyes
<i>Boscia albitrunca</i>	Treatment of epilepsy. Used in the taming of cattle.
<i>Cassia abbreviata</i>	Treatment of bilharzia. Fruit is used in protection of households against evil powers.
<i>Cassine transvaalensis</i>	Bark infusion is used in the treatment of severe stomach aches
<i>Combretum imberbe</i>	Treatment of mental illnesses
<i>Combretum mycrophyllum</i>	Used to treat mental illnesses
<i>Combretum zeyheri</i>	Treatment of woman after giving birth
<i>Dichrostachys cinerea</i>	Roots are used in treatment of various body pains, toothaches and skin rashes
<i>Diospyros mespiliformis</i>	A strong purgative used in the treatment of severe venereal diseases. Cleans eyesores in cattle.
<i>Eurphobia ingens</i>	Used to clean wounds in cattle and cancerous wounds in people.
<i>Garcinia livingstonei</i>	Tooth aches
<i>Kirkia acuminata</i>	Roots chewed to treat colds and lack of appetite
<i>Lannea stuhlmanii</i>	Used to treat traumatic stresses by inducing insomnia
<i>Maytenus senegalensis</i>	Treatment of colds
<i>Pterocarpus angolensis</i>	Used in the cleaning of wounds and sores around genital areas
<i>Schotia brachypetala</i>	Used in the treatment of stomach disorders
<i>Sclerocarya birrea</i>	Used to protect households against evil powers, treatment of sterility and malaria. Included in the contraception of married women.
<i>Securidaca longepedunculata</i>	Very strong aphrodisiac
<i>Pterocarpus angolensis</i>	Treatments of wound and sores
<i>Synadenium cupulare</i>	Treatment of venereal diseases. Cleans sores in livestock
<i>Trichilia emetica</i>	Treatment of venereal diseases
<i>Ziziphus mucronata</i>	Protects the household against evil powers
<i>Elephantorrhiza burkei</i>	Leaf infusion is used to get rid of worms in both children and adults
Mukuvhazwivhi *	Treat venereal diseases
Mutudza *	Included in infant food for various ailments including weight loss
Lutundambevha *	
Masote *	

3.4.1.7. Artefacts, Utensils and other Miscellaneous Products

The information about the use of wood in the manufacturing of curios and household tools in the three villages is limited to few individuals. In Bend-Mutale, three crafts people were interviewed, one in Ha-Nkotzwi, and the other two in Musunda. Among these six individuals however, drums, pestles and mortars, cooking utensils, handles for household tools, wooden trays (tselo) and baskets (mithatha), food and washing baskets and sleeping mats were produced and sold within and without the study villages (Table 3.4).

Table 3.4. Plant species that are used in the manufacturing of artefacts, household utensils and other products in the three study villages in the Northern Province.

Plant species	Uses
<i>Acacia gerrardii</i>	Food trays (tselo)
<i>Azelia quanzensis</i>	Drums, mortars and sculptures
<i>Albizia versicolor</i>	Drums
<i>Berchemia discolor</i>	Pestles and dyes
<i>Bolusanthus speciosus</i>	Axe handles and donkey harness-kits
<i>Cassine transvaalensis</i>	Wooden spoons and whisks
<i>Combretum apiculatum</i>	Pestles
<i>Combretum hereroense</i>	Axe and hoe handles
<i>Combretum zeyheri</i>	Food baskets (mithatha)
<i>Diospyros mespiliformis</i>	Pestles
<i>Ficus sycomoros</i>	Drums
<i>Gardenia volkensii</i>	Wooden spoons
<i>Grewia versicolor</i>	Food-trays and food-baskets
<i>Hyphaene petersiana</i>	Mats, baskets and brooms
<i>Kirkia acuminata</i>	Wooden bowls
<i>Landolphia kirkii</i>	Whisks
<i>Lonchocarpus capassa</i>	Pestle and tool handles
<i>Markamia acuminata</i>	Wooden spoons
<i>Peltophorum africanum</i>	Ornaments and tool handles
<i>Phoenix reclinata</i>	Broom and baskets
<i>Pterocarpus angolensis</i>	Drums and ornaments
<i>Spyrostachys Africana</i>	Ornaments

The making of larger pieces such as drums and mortars requires the felling of large branches and sometimes whole trees. Plant species with strong wood, attractive wood

colour and texture, good acoustic characteristics and that are resistant to wood borers are used. Species used for drum carving include *Albizia versicolor*, *Azelia quanzensis*, *Ficus sycamoros* and *Pterocarpus angolensis*.

The making of pestles for grinding maize requires a strong and heavy wood such as that of *Berchemia discolor*, *Combretum apiculatum*, *Diospyros mespiliformis* and *Lonchocarpus capassa*, that will not crack during the pounding of maize. For sculptures and ornaments plant species such as *Peltophorum africanum* and *Spyrostachys africana*, with attractive wood that does not crack when dry is used. The wood is polished to a smooth finish to reveal attractive patterns of the wood.

Handles of hoes and axes, walking sticks and harness-kit for donkeys are also manufactured in villages. Plants that are used for this purpose are light but strong as not to burden the user or animals. Species that are used include *Acacia nigrescens* for walking sticks, *Bolusanthus speciosus* and *Combretum hereroense* for axe and hoe handles and donkey harnesses.

Cooking utensils such as wooden spoons and whisks are made of wood from species such as *Cassine transvaalensis*, *Gardenia volkensii*, *Landolphia kirkii* and *Markamia acuminata*, that are light in colour, not poisonous and do not bend when soaked in water. Food trays (tselo) are made by weaving thin strips of wood that are sliced from mature branches of *Acacia gerrardii*. The edges are trimmed by thin branches of *Grewia versicolor*. Food baskets are also made from weaving *Grewia versicolor* around thin branches of *Combretum zeyheri*.

Palm leaves of *Hyphaene petersiana* and *Phoenix reclinata* are used for a variety of purposes. The midribs of the leaves are used to make long-lasting brooms. Pith and leaves of these palms are used to weave mats and baskets of all kinds. The leaves are also used to make rattles that are tied around ankles during traditional dances. The piths and leaves can also be dyed into a deep purple colour by cooking the leaves of the palm with bark of *Berchemia discolor*. A sedge called Mutate is used to make traditional,

comfortable sleeping mats. Leaf-bundles of the sedge are bound together by rows of sisal rope. Sisal is not available in the village and is collected from other nearby villages.

Most of the household products that are produced are sold within the villages and in neighbouring villages. Cooking utensils are usually produced as per order. Ornaments baskets and bowls are sold in markets and curio shops in town centres. Drums and heavier pieces of wood are also produced as per demanded and are mainly sold to traditional healers and dancing groups, foreign tourists, hotel and lodge owners and curio shops.

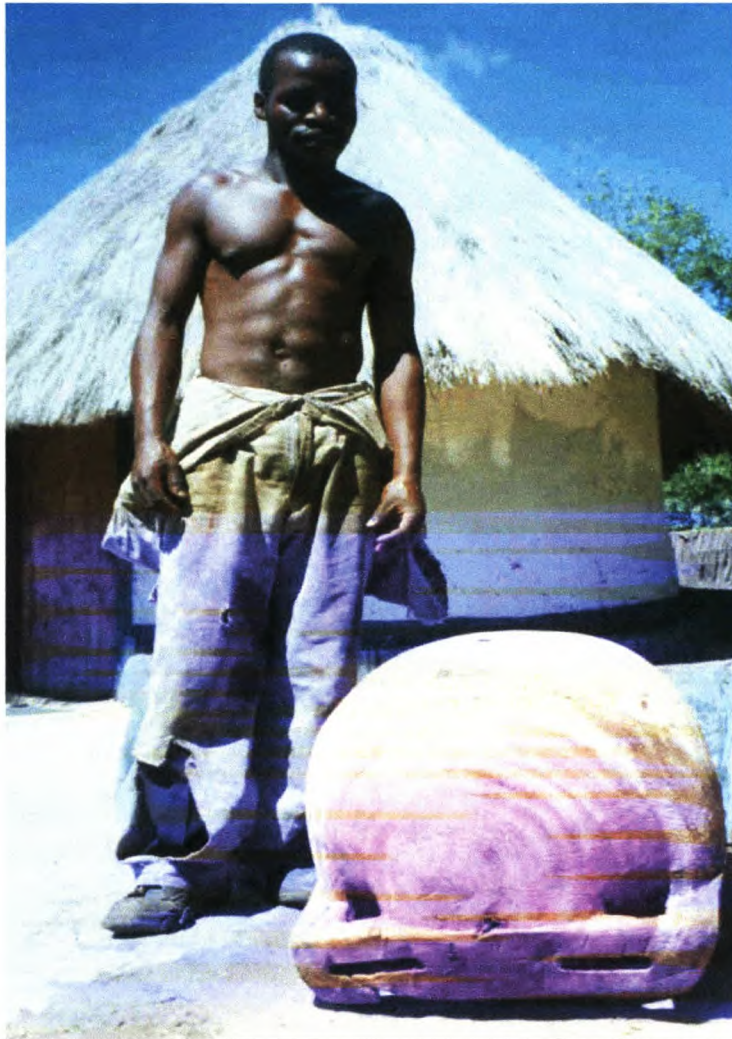


Plate 4.1. A carpenter from Bend Mutale village with an unfinished drum that he is carving. This is a drum that is regarded as sacred and is only played during special ceremonies.

Table 3.5. Utilisation and control of communally owned plants and plant products by different community members in the study area, Northern Province.

Resource type	Product/use	Primary collector			End user of the product			Who controls/own the resource used			Degree of use		
		Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda
Wood and wood based products	Fuelwood	All ¹	Women	All	Households			Not controlled			Very high		
	Construction timber and fencing poles	Men	Men	Men	Households			Not controlled			High	High	Declining
	Carving wood,	Men (woodcarvers)			Men (woodcarvers)			Controlled by headman as whole trees are felled			Low	Very low	Low
	Utensils and tools	Men and boys			Households			Not controlled			Low	Low	Low
Roots bark and leaves	Ropes and fibres	Boys, men and women	Men	Men and women	Boys, men and women	Men	Men and women	Not controlled			Low	Low	Low
	Medicine	Traditional healers (men and women)	*.2	Traditional healers (men and women)	Traditional healers (men and women)	*	Traditional healers (men and women)	Not controlled		Not controlled	High		High
	Artefacts, oils and dyes	Men and women	Men and women	Men and women	Crafts people	Crafts people	Crafts people	Not controlled			Low	Low	Low
	Browse and fodder	Men	Men	Men	Livestock owners	Livestock owners	Livestock owners	Not controlled			Used during droughts and for feeding nursing-cows		

(1. 'All' refers to men women and children utilising the resource. 2. *-members in the village claim that they are Zionists and they do not use traditional medicine)

Table 3.5. Continued.

Resource type	Product/use	Primary collector			End user of the product			Who controls/own the resource used			Degree of use		
		Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda
Fruits and nuts	Food	All	All	All	All	All	All	All other fruits are not controlled but Marula fruit are controlled by the headman	High	High	High		
	Drinks	Women	Women	Women	Men and women, Children drink unfermented form				Very high	High	Very high		
	Kernels	Women and children			All	All	All	Not controlled	Low	Low	Low		
Annual herbs	Wild vegetables	Girls and women	Girls and women	Girls and women	All	All	All	Not controlled	High	High	High		
	Medicine	Traditional healers (men and women)		Traditional healers (men and women)	Traditional healers (men and women)		Traditional healers (men and women)	Not controlled	Low	Low	Low		
Palms	Fruit	Women			Women and children			Mostly found behind the park fences where access is difficult	Low	Low	Low		
	Wine	Men and women	Women	None	Men and women		Not available		Low	Low	None		
	Leaves for weaving, tools and artefacts	Men and women (craftspeople)			Households or sold				Low	Low	Low		

(1. 'All' refers to men women and children utilising the resource. 2. *-members in the village claim that they are Zionists and they do not use traditional medicine)

3.4.1.8. Analysis

Plant based resources are the most utilised component of forest-based natural resources in all the three villages. PRA tools revealed the use of sixty-four plant species in the villages (See Appendix D). Twenty-one of these plants are used for three or more purposes. The most used tree species in the three villages is *Colophospermum mopane* and it is the dominant species in the surrounding vegetation (See Table 3.6).

Table 3.6. A list of the commonly used tree species in the three villages in the Northern Province.

Plant species	Uses	No of uses
<i>Acacia gerrardii</i>	Forage, medicine, cattle medicine and ropes	4
<i>Acacia nigrescens</i>	Fuelwood, fencing poles, medicine and utensils	4
<i>Acacia robusta</i>	Food, human medicine and ropes	3
<i>Adansonia digitata</i>	Food, medicine, ropes	3
<i>Azelia quanzensis</i>	Fuelwood, forage, human medicine, utensils	4
<i>Androstachys johnsonii</i>	Food, fuelwood, forage, dwelling construction, and fencing	5
<i>Boscia albitrunca</i>	Food, forage, human medicine, cattle medicine artefacts and utensils	5
<i>Cassine transvaalensis</i>	Drink, human medicine, artefacts and utensils	4
<i>Colophospermum mopane</i>	Food, fuelwood, dwelling construction, fencing, forage, ropes	6
<i>Combretum zeyheri</i>	Dwelling construction, human medicine and artefacts and utensils	3
<i>Dichrostachys cinerea</i>	Fencing, human medicine and ropes	3
<i>Gardenia volkensii</i>	Fencing, human medicine and artefacts and utensils	3
<i>Hyphaene petersiana</i>	Food, drinks, artefacts and utensils, ropes	4
<i>Kirkia acuminata</i>	Dwelling construction, human medicine artefacts and utensils	3
<i>Lonchocarpus capassa</i>	Forage, dwelling construction, artefacts and utensils	3
<i>Maytenus senegalensis</i>	Food, forage and human medicine	3
<i>Peltophorum africanum</i>	Fuelwood, forage, artefacts and utensils	3
<i>Phoenix reclinata</i>	Food, drinks, artefacts and utensils	3
<i>Sclerocarya birrea</i>	Food, drink, dwelling construction, human medicine	4
<i>Ziziphus mucronata</i>	Food, forage, fencing and human medicine	4

Androstachys johnsonii is used mainly for construction and fencing poles and *Boscia albitrunca* provides attractive wood for artefacts and utensils. Other species are used mainly in the absence or scarcity of preferred species. Contrary to findings by Luoga *et al.* (2000) that rural communities in Cameroon use more plant species for fuelwood than for other uses, a broader range of plant species is used for food than for other uses in the three communities (see appendix D). The reason for these may be the availability of better quality wood of *Colophospermum mopane*. Liengme (1983) related the consumption of fuelwood with the availability, and *C. mopane* is the dominant species in the surrounding woodland. The absence of wood stockpiling may also be related to the availability of wood and the shorter collection trips.

The use of construction poles in the three communities was varying. Though the use of poles were mentioned during RRA exercises in all the villages, there was a visible trend of substituting woodland poles with commercial timber. Most of the dwellings had mud or brick-walls instead of traditional wooden walls. This shift seems to point to the lack of durable, straight, long and insect resistant poles in the woodland because of the previous drought and the availability of commercial timber in the Masisi business area.

Even though food plants species are abundant, the collection of plants for food is not regarded as an important component of rural diet. Except for few vegetables that have been domesticated, the communities do not consider wild foods important. However, it does provide them with a supplement, a relish, and an emergency resource during times of drought and economic stress. Collection of plants for food is often the domain of women and children, while wild fruit is harvested and consumed mainly by boys.

The collection of medicinal plants is relatively minor compared to other plant-based resource use such as firewood and food collection. It has, however a major influence in determining the selection of plant species that are used for other purposes and there are informal rules that ensure successful management of useful but scarce medicinal plants.

3.4.2. Utilisation of Wildlife and Wildlife-based Products

(Refer to Table 3.7)

3.4.2.1. Insects

A variety of insects forms part of the diet of the communities in the three villages. These are either collected in the surrounding forest or bought from neighbouring villages. They include *Gonimbrasia belina* (mopane worms), various other caterpillars, termites, flying termites (Isoptera), crickets, green-beetles (Thongolifha) and locusts (Orthoptera).

(a) Mopane Worms

Mopane worms (mashonzha) are collected in Bend-Mutale and Ha-Nkotzwi villages. They are collected by all sections of the community especially women. They are picked from *Colophospermum mopane trees*, degutted and processed in one of several methods that are beyond the scope of this study. Collection is carried out in March and April before they become pupae (u dzama). Dried mopane worms are a delicacy in the Northern Province and are harvested in large quantities. People from other areas are allowed to harvest without permits. They are sold locally and in urban markets.

(b) Giant Termites

Giant termites are collected from termite hills in the fields and woodland around the villages. Either canals of the termite hill are exposed using a hoe and a sedge locally known as Mutate or bark fibre of *Annona senegalensis* is inserted into the canal. When the sedge is pulled out, the soldier termites that have bitten into the sedge or fibre are collected into a container. Collection of termites is carried out by women and children. They are collected throughout the year but are more abundant after rains. They are collected for household consumption and can also be dried and stored for future use. Although they were not being sold in the study villages, they were being sold in markets in the nearest urban centre of Thohoyandou.

The winged termites that leave the nests after rain to mate and initiate new nests are also a delicacy in the region. They are collected from termite hills and in fields around homesteads, during the summer months of November to January. They are collected for household consumption and can be dried and stored. Like termites, they were also being sold in urban markets.

(c) Locusts and Crickets

Locusts are mainly collected by children especially girls. The collection process is quite challenging. It involves searching the grass using a branch and when found, they are chased until cornered or tired. Locusts are collected all year round but are found in large quantities after the February rains. Their consumption in households is not widespread in Bend-Mutale and Ha-Nkotzwi, and children and the elderly in Musunda consume them as snack.

Crickets are collected by women and children. One way of collection involves the use of thin grass stem, which is inserted into their holes on the ground to force them out. The other cunning method is to direct a centipede secured by a string into their holes. The simplest method is to follow behind a plough during the ploughing season and catch them as they are exposed. Their consumption is also not popular and some children denied ever eating them. They are regarded as poor people's food in Musunda.

3.4.2.2. Wild Animals

The three study villages are situated next to the fences of the Kruger National Park. Apart from the usual rabbits and bush-rats, wildlife from the Park spills over into the village areas. This happens especially when fences are damaged or broken by elephants and buffalo or by disasters such as floods.

In the participatory activities that were conducted in the communities, little about the use of wildlife was revealed. Informal discussions however revealed that hunting is common

to all three villages. Bend-Mutale and Musunda residents claimed that they only hunted rabbits and sometimes wild pigs. Ha-Nkotchwi villages hunted rabbits, small antelopes and even Thompson's gazelles.

Private discussions with individuals in the three villages revealed prevalent organised poaching within the Park itself. Poaching trips were common during the data collection period. Discussion with one of the rangers confirmed that even buffalo were occasionally killed within the Park.

Traditional healers confirmed the extent of hunting as they also used skins and other parts of animals in their trade. Horns are mainly used as containers for powders. Pieces of skins of predators such as lions and leopards and scavengers such as hyenas and jackals were prized. Most of the skins are used as in making a headgear for the traditional healer. Reptiles are never eaten in any of the villages. In Musunda, dead reptiles apart from snakes are taken to the traditional healer for a fee. Snakes are always killed on sight and only dead pythons are taken to the healers.

Birds are harvested for food in two ways. One way is to use catapults, which require skill (Plate 2.). The other is by using birdlime, a sticky latex from a variety of *Ficus* species (Muumo) and *Rauwolfia kirki* (Mukwatule). Birds are collected by boys and men, especially cattle-herders. Predatory birds are killed because they attack chickens in all villages. Owls are hunted and killed particularly in Musunda, as they are regarded as carriers of evil influences.

Fish is a favourite food in Bend-Mutale and Ha-Nkotchwi. Inhabitant from all sections of the community fish in the Mutale River. There are two ways of fishing, line fishing and netting. Line fishing is used by men and boys using porridge or earthworm as bait. Net fishing (u kukuta) in these two villages involves the use of empty bags of maize. Two individuals hold both ends of the bag and dive, pushing the bag towards the bank with the hope of trapping fish within it. This is the most productive way of fishing although small

fish are also caught. This method is used in the Mutale river with the full knowledge of the presence of crocodiles.

In Musunda fishing is declining because access to the Luvuvhu river is made difficult by the erection of a Park fence. Villagers are now forced to fish in the Langwe river which is distant and does not contain the quantity of fish that the Luvuvhu river does.

Honey collection is one activity that is carried out by men, especially cattle-herders. The activity is declining in Bend-Mutale and Ha-Nkotzwi but is still carried out by many in Musunda. The honey that is collected is usually consumed in the woodland and only brought home if surplus was harvested.



Plate 2. A young man from Musunda holding a boabab fruit and catapults that are used to hunt birds. This type of hunting require skill to be effective

Table 3.7. Summary of the utilisation and control of wildlife and wildlife products in communally owned land by different community members in the study area, Northern Province.

Resource		Primary collector			End user of the product			Who controls/own the resource used			Degree of use		
Resource type	Product/use	Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda
Insects	Mopane worms	All and majority are women		None available	Households and for sale		Bought for household use	The headman		N/A	Very high		Very high
	Termites	Women and children			Households			Not controlled			High		
	Locusts	Women and children			Households			Not controlled			Low		
	<i>Grylotalpa africana</i>	Women and children			Households			Not controlled			Low		
Small mammals and buck	Food	Men and boys			Households			State			Low	Low	High
	Skins and/as cultural artefacts	Men	*	Men and boys	Men and boys	*	Men and boys	State			Very low	*	Very low
	Medicine	Men and traditional healers	*	Men and traditional healers	Traditional healers	*	Traditional healers	Only dead animals may be used for medical purposes			Very low	*	Very low
Birds	Food	Men and boys			Households			State – National Parks			High but decreasing		
	Medicinal uses	Men and boys	*	Men and boys	Traditional healers	*	Traditional healers	State – National Parks			Low	*	Low
Reptiles	Medicinal uses	Men and boys and traditional healers	*	Men and boys and traditional healers	Traditional healers	*	Traditional healers	Not controlled as most are pests			Low	*	Low
Fish	Food	All	All	Males	Households and for sale			Not controlled			High		Declining
Bees	Food (honey)	Men and boys			Households			Not controlled			Low	Low	High

'All' refers to men women and children using the resource. * = members in the village claim that they are Zionists and they do not use traditional medicine)

3.4.2.3. Analysis

The most common edible insects in the three communities are mopane worms and termite alates. The yields of these insects are highly seasonal and demonstrate considerable yearly variation. These are an important source of protein during the rainy season before the planting of crops. Destructive harvesting of caterpillars, that was reported by authors such as Brigham *et. al.* (1991) and Chidumayo (1997), was not significant in the study areas.

Birds, rodents and other mammals that are reported to form an important component of rural diets in many areas are available in the woodlands surrounding the communities. Their hunting of different animals is conducted over different periods of the year and this prevents over-exploitation of on species. Wild meat is regarded as a supplement to beef, mutton or pork. Sale of wild meat was not recorded during the study. The reason for that may be the illegality that surrounds hunting of wild animals.

3.4.3. Utilisation of Abiotic Natural Resources

(Refer to Table 3.8)

3.4.3.1. Water

The three study villages are all well situated next to rivers that are perennial. Bend-Mutale and Ha-Nkotzwi share the Mutale River while the Langwe and Khongodoli rivers are close to the settlement area of Musunda. There is plenty of water for all other purposes except drinking. Drinking water in Bend-Mutale is collected from a system of taps that are supplied by two water tanks. Each household pays ten Rands a month for diesel to run the engine and to buy chlorine tablets used to sterilise water in the tanks. One household had its own borehole for drinking water. Residences in Ha-Nkotzwi do not have piped water. They collect drinking water from a nearby natural spring. The spring is not adequately fenced and livestock usually break down the fence and damage the spring. Musunda residents have piped water that is pumped into a dam. There is a fee

for the diesel when the pump is working. Residents collect water from a spring next to the old borehole when the pump is inactive.

Villagers in all the villages do their bathing and washing in the rivers. Some villagers also collect washing and bathing water from rivers and perform their duties at home. The collection of water is carried out by all in Bend-Mutale and by women and girls in Ha-Nkotchwi and Musunda.

3.4.3.2. Building Materials

The building of dwelling structures in all the villages involves the use of bricks and clay although some households in Bend-Mutale still build wooden huts. Clay for brick making is obtained from one's own plot. Sand is collected from river banks in donkey carts and as head-loads. Special soil (tshitavha) for decorating floors and interconnecting walls (guvha) is collected by women from specific areas and carried home in head-loads.

3.4.3.3. Clay for Pottery.

Female potters in Bend-Mutale collect special dark-coloured clay for pottery from a distant clay-hole on the banks of the Mutale River. This is carried in bags loaded on donkeys, as it is heavy. The Musunda potter obtains her clay from the banks of the Langwe River.



Plate 3. A traditional hut in Ha-Nkotchwi village. Note the elaborate designs on the walls and the colours that are used. Mixing a commercial dye with lime creates the green colour. The black colour is a mixture of lime with battery contents

Table 3.8. Summary of the utilisation and control of communally owned abiotic natural resources by different community members in the study area, Northern Province.

Resource		Primary collector			End user of the product			Who controls/own the resource used			Degree of use		
Type	Uses	Bend-Mutale	Ha-Nkotzwi	Musunda	Bend-Mutale	Ha-Nkotzwi	Musunda	B-Mutale	H-Nkotzwi	Musunda	B-Mutale	Ha-Nkotzwi	Musunda
Water	Drinking, cooking and domestic ablution	All	Women and girls	Women and girls	Households			Not controlled			Very high		
	Washing (clothes)	All except married men			Women and children			Not controlled			High		
Sand and soil	Building	Mainly men and boys (women to a lesser extent)			Men and boys			Sand collected from rivers but soil is collected either from ones stand or communal soil pits			Moderate	Low	High
	Decoration	Women and girls			Women and girls			Not controlled			Low	Low	High
Clay	Pottery and paving	Women & potters	Women	Women & potters	Women & potters	Women	Women potters	Not controlled			Low	Low	Low

'All' refers to men women and children using the resource.

3.5. Agricultural Productivity in the Three Study Villages.

This section presents findings that were obtained through the seasonal calendar activity, household survey and from discussions held with residents in the villages. Transect walks through the villages revealed that a large percentage of village land is set aside for cultivation and livestock grazing. A variety of crops is cultivated and different kinds of livestock are kept in the villages.

3.5.1. Crop Production.

Crops that are produced are similar in the three villages in the study area. They include maize, sorghum, millet, groundnuts, beans (*Vigna* sp.), pumpkins and watermelons. This is dry land low intensity farming which produces good harvest in good rainy seasons.

Land preparation and ploughing on land that is cultivated yearly starts in October. Kraal manure is sometimes spread in the fields before ploughing. Donkey ploughing is still practised but tractors are being used in Bend-Mutale and Musunda by households that can afford them. Ox ploughing is no longer practised in the study area.

Planting is done in three ways. Seed is either scattered around the field before ploughing or put into the soil while walking behind the plough. The third method is usually practised in fields that are ploughed by tractors or those that were ploughed early in the season. In this case planting is carried out by lifting soil using a hoe and dropping the seed into the depression. In this method, seed is kept in the mouth and spat into the ground. Poison treated seeds are dropped by hand. Planting is carried out from late October to late December.

Main crops such as maize, sorghum and millet are usually grown mixed with other crops such as groundnuts, pumpkins or beans. These are planted after the main crop has germinated, and at the same time, seeds of the main crop that have not germinated are replaced.

Weeding starts around December to February. This is done using a hoe in between the crops. During this time, other crops such as pumpkin leaves and flowers will be ready to be harvested and green maize may be harvested for household consumption or for sale.

Harvesting of mature maize takes place around April to May while sorghum and millet may be left for longer. Harvested maize-cobs are carried away in donkey carts or small head-loads. Maize may be stored in granaries on the cobs or can be put in bags as seeds.

Millet and sorghum are harvested in the field and taken to a collection point in the middle of the field where the stalks will be threshed using sticks or donkeys. The grain is then winnowed using food trays (tselo) and loaded into bags and transported home in donkey carts.

Harvesting of groundnuts involves the uprooting of whole plants that are then carried home. Actual nuts are plucked from the roots and spread out in the sun to dry. The remaining leaves and branches are fed to livestock. Groundnuts may be stored as they are, or else nuts are removed and stored in bags. Bean pods are picked and dried at home, opened up and stored.

Table 3.9. shows the proportion of households growing different crops in the three villages and the annual average output per household, retail selling prices and number of households selling the crop. Millet is the main crop that is cultivated to bring income in the three villages. There is always a good market for millet in the Northern Province where it is mainly used in the brewing of traditional beer. Groundnuts are sold to vendors in the urban areas who roast and sell them in small packets.

Table 3.9. Crop output and prices in the three study villages in the Northern Province.

Crop	Villages	Proportion (%) of households growing crops	Mean output per households growing crops	Retail prices from bulk sellers (Rands)	Number of households selling crop
Maize – dry	Bend-Mutale	70.8	12 bags	110/bag	4
	Ha-Nkotzwi	80	8 bags		0
	Musunda	86	12,5 bags		2
Sorghum	Bend-Mutale	25	3.6 bags	80/bag	3
	Ha-Nkotzwi	4	5.4bags		2
	Musunda	56.5	4.5bags		3
Millet	Bend-Mutale	20.8	6.4 bags	180/bag	7
	Ha-Nkotzwi	20	3.3 bags		3
	Musunda	39.1	4.8 bags		8
Groundnuts	Bend-Mutale	66.7	7.5 bags	250/bag	4
	Ha-Nkotzwi	60.6	5.5		2
	Musunda	56.5	5.4		6
Pumpkins	Bend-Mutale	54.2	-*	-	0
	Ha-Nkotzwi	60	-		0
	Musunda	60.9	-		0
Watermelons	Bend-Mutale	25	-*	5.00	9
	Ha-Nkotzwi	33.3	-		5
	Musunda	30.4	-		6

*Values for watermelons and pumpkins were difficult to quantify as they are harvested intermittently and not in bulk. Pumpkins are not sold.

3.5.2. Livestock Production.

The abundance of livestock, especially cattle, is obvious to any visitor to the area, which is known as the cattle area in the eastern Lowveld. The roads are dangerous, especially at night. Many lives have been claimed by vehicular collisions with livestock in these areas.

Grazing is plentiful in all the three villages. Ha-Nkotzwi village has relatively more open grazing land than the other two villages. Grazing land was divided into supervised grazing camps by agricultural authorities in all the villages, but after the devastating drought of the early 1980s, all fences were broken and have never been repaired since.

The table below shows the types of livestock owned in the three villages, the percentage of households owning them and the mean number of livestock owned by the villagers.

Table 3.10. Livestock ownership by households in the three study villages in the Northern Province.

Livestock	Village					
	Bend-Mutale		Ha-Nkotchwi		Musunda	
	Proportion of households owning livestock (%)	Mean no of livestock owned per house hold \pm SD	Proportion of households owning livestock (%)	Mean no of stocks owned per house hold \pm SD	Proportion of households owning livestock (%)	Mean no of stocks owned per house hold \pm SD
Cattle	29.2	118.2 \pm 76.4	46.6	95.3 \pm 66.6	39.1	71.2 \pm 45.3
Goats	20.84	32.4 \pm 21.6	26.7	35.4 \pm 21.3	43.4	28.5 \pm 14.4
Donkeys	25	7.4 \pm 4.6	13.3	7.5 \pm 3.3	34.8	8.2 \pm 3.6
Pigs	16.7	5.1 \pm 3.5	-*	-	26.1	7.6 \pm 4.4
Chicken	66.7	14,9 \pm 8.3	66.6	8.9 \pm 4.1	56.5	13.4 \pm 7.4
Ducks	12.5	7.4 \pm 5.5	6.7	5.5 \pm 3.2	13.04	12.5 \pm 4.5

*No pigs were recorded in Ha-Nkotchwi village.

Cattle are the dominant livestock in all the villages followed by goats. A few sheep in Bend-Mutale and Musunda were seen grazing with goats. Their number was relatively insignificant so they were not included in Table.3.10. As the table indicates, cattle are the dominating livestock and their actual numbers in the area high. This is due to cattle that belong to people who are not residents in these communities are kept there for a fee. Cattle are brought into the area because of its high pasture quality, usually by business people who live in the urban areas. They employ local people to look after them and visit the area regularly.

Cattle owners in the villages rarely sell cattle. They only do so in times of pressing financial need. Cattle prices differed within and between villages but they ranged from R1500.00 to R2500.00 per beast. Slaughtering cattle for meat is not common. They are slaughtered during social gatherings like weddings or funerals or if animals are sick.

Cow's milk is available in large quantities in the three villages. It is used for house consumption or sold at R2.00 a litre in Bend-Mutale and Ha-Nkotchwi and R2.50 in Musunda. Goats are usually kept for the provision of meat to households during festive

days or other important days. They are readily sold in all the villages. Prices range between R150.00 to R250.00 for a big goat. Goat's milk is consumed in the villages although not as much as cow's milk. Goat's milk is also sold.

Donkeys are mainly kept for draught work. They are used to carry loads of goods on their backs, to pull donkey carts and to plough the fields. Ox ploughing is not practised in the area. Donkeys are never kept for meat or milk. They are hardy animals and are easy to maintain. They are sold for around R100.00 to R150.00 in the Musunda and Bend-Mutale areas. During a transect walk in Bend-Mutale several horses and mules were noticed. The horses are said to have strayed from the nearby army base in the past and now are wild and reproducing among themselves and with local donkeys.

Pigs are kept in Bend-Mutale and Musunda. There were none in Ha-Nkotswi. Pigs are kept mainly for meat and for sale. Piglets that are ready for slaughter are sold for R50.00 to R60.00. In Musunda, pigs are sold in large numbers to people from urban areas that specifically come to the area to buy them.

3.6. Patterns of Agricultural and Non-agricultural Activities in the Study Villages

As the majority of residents in the study, villages are not formally employed, daily routines and activities that are carried out in the three villages are governed by the seasons and the availability of natural resources (Table 3.11).

During the participatory exercises, it became evident that main activities around which life in the three villages revolve are cultivation of crops. Most of the other activities except livestock herding are done when there is little or no work in the crop fields. Most of the building and repairs of the dwelling structures are carried out in winter. Essential activities such as food collection are determined more by the availability of resources than by choice.



Plates 4 and 5. Boys from Bend Mutale and Musunda villages collecting wood and water in donkey carts.

Table 3.11. Seasonal calendar of the rural activities, availability and use of natural resources in the three villages, Northern Province. (Actors legend: M – men, W – women, G – girls and B – boys. Villages’ legend: 1 – Bend-Mutale, 2 – Ha-Nkotzwi, 3. Musunda and All – all three villages)

Months of the year		Oct	Nov	Dec	Jan	Feb	Mar	Apr	Ma	Ju n	Jul	Aug	Sep
Traditional seasons of the year		Summer (tshilimo)					Autumn (Tshifhefho)			Winter (Vhuriha)		Spring (Lutavula)	
Activity	Actors	Villages											
Non agricultural activities													
Brick making and laying	M & W									All	All	All	
Grass harvesting	M, W, G & B								All	All			
Firewood collection	M, W, G & B							All	All	All	All	All	
Wood carving and cooking utensils	M										1	1	
Mats and basket making	W							All	All	All	All		
Medicines	M & W	3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3	1, 3
Hunting	M & B	All	All	All	All	All	All	All	All	All	All	All	All
Agricultural activities													
Land preparation and ploughing	M & B	All	All										1 & 2
Planting	M, W, G & B		All	All									
Weeding	M, W, G & B			All	All								
Harvesting	M, W, G & B						All	All					

Months of the year			Oct	Nov	Dec	Jan	Feb	Mar	Apr	Ma	Ju n	Jul	Aug	Sep	
Traditional seasons of the year			Summer (tshilimo)					Autumn (Tshifhefho)			Winter (Vhuriha)		Spring (Lutavula)		
Livestock herding	Cattle	M & B	All	All	All	All	All	All	All						
	Goats	B	All	All	All	All	All	All	All	All	All	All	All	All	
	Donkeys	M & B	All	All	All	All	All								
Wild foods collection															
Fruit	<i>Berchemia discolor</i>	B				All	All	All	All						
	<i>Diospyros mespiliformis</i>	B									All	All			
	<i>Sclerocarya birrea</i>	W, G & B					All	All	All						
	<i>Hexabolus monopetalus</i>	B		All	All	All									
	<i>Ficus sycomorus</i>	M, W, G & B	All	All	All	All	All	All	All	All	All	All	All	All	
	<i>Ximenia Americana</i>	B & G						2 & 3	2 & 3						
	<i>Adansonia digitata</i>	M & B	All	All	All	All	All	All	All	All	All	All	All	All	
Insects	Mopane worms	M, W, G & B						1 & 2	1 & 2						
	Termites	W, G & B	All	All	All	All	All	All	All	All	All	All	All	All	
	Flying termites	M, W, G & B		All	All	All									
	Crickets	W, G & B		All	All	All	All	All	All						
	Locusts	G & B						All	All	All					
Wild vegetables	W & G		All	All	All	All	All								
Honey	M & B				All	All	All	All							
Forage availability	Livestock		All	All	All	All	All	All	All	All	All	All	All	All	
Food availability	Household						All	All	All	All					
Rainfall			All	All	All	All	All								

3.7. Contribution of non-farm income to rural livelihoods of communities in the study area

Due to lack of infrastructural development and low education levels in and near the study villages there is little formal employment in these villages. The nearest available employers in the area are ISCOR⁵ in Tshikondeni mine, the Kruger National Park and the local government departments.

The study revealed that very few people are employed in these institutions. In Bend-Mutale, two men were employed in Tshikondeni Mine, none in Kruger National Park and three were employed by the Government and worked in Sibasa. Two men also work as night watchmen at businesses in Masisi. Other formally employed people were all migrant workers who are in the cities. In Ha-Nkotzwi, nobody is employed by the local employment institutions. Few are migrant workers in the cities. In Musunda, there were three men employed at Tshikondeni mine, one employed as a ranger in the Kruger National Park and two youths who were teachers have moved from the village to stay in the urban areas.

Informal employment in the villages is the main source of income in this sector. Most of the men are employed to look after cattle that have been brought into their villages by people from without the village. They are poorly paid and sometimes spend months without receiving their money. In one case in Musunda, a group of unpaid herders sold cattle without the owner's knowledge. Local herding employment is minimal as households normally use their own family members. Labour employment in the fields is scarce as households make use of communal labour (Davha) during weeding and harvesting.

Employment of women in Ha-Nkotzwi and Musunda is non-existent. In Bend-Mutale, three women are employed as cleaners in a newly built camp next to the Mutale River; one is a shop assistant in a small shop in the village.

⁵ Iron and Steel corporation

Pension and welfare grants to the elderly were highest in Musunda followed by Bend-Mutale. In most households, this was the only source of income.

The table below details the composition of formal and informal employment and estimates of income derived from these activities. These results were derived from household questionnaires and discussions that were held during the study.

Table 3.12. Composition of non-farm income in the three study villages, Northern Province. Results obtained from household surveys conducted in each of the three villages.

Source of income	Bend-Mutale		Ha-Nklotzwi		Musunda	
	% of households with income from source	Average income for household (R/month)	% of households with income from source	Average income for household (R/month)	% of households with income from source	Average income for household (R/month)
Formal wage income	25	546	13.3	650	21.7	724
Informal wage income (labour)	37.5	220	20	160	26.1	180
Remittances	20.8	355	10-	-*	34.7	420
Businesses	20.8	2000	-	-*	13.04	1500
Pensions	37.5	555	33.3	550	43.4	640

* There is no remittance value recorded for Ha-Nklotzwi village as the households with migrant workers were not willing to divulge that information. There were also no business people recorded in the study at Ha-Nklotzwi.

The differences in average sources of income for all the villages are attributed to several factors. Formal wage income have been calculated based on the actual salaries of the households that are local based plus estimated figures of income from migrant workers in the cities. The size of the remittances also depends on the amounts earned by migrant workers. Pensions were inclusive of welfare grants and retirement pensions that are earned by the elderly in the villages.

3.8. Management of resources: tenurial and institutional issues

Tenure system in the study area is quite complex and cannot be satisfactorily placed under one of the different tenure terminology described in Chapter 1. Natural resources are managed under more than one property regimes. The tenure system that governs the use of woodland natural resources may be described both as common property and as open access or non-property regime. The crop-fields found within and around the woodlands are private properties of homesteads that have fenced them or that utilise them every season.

The headman, in all the villages, is in charge of land and all its resources. The use of resources by the community is open except for the use of few sacred plants such as *Adansonia digitata* and *Sclerocarya birrea*. The felling of sacred trees such as *Sclerocarya birrea* and *Adansonia digitata* is prohibited without the permission of the headmen. The collection of marula fruit has to wait for the decree from the headman after a ritual ceremony has been conducted. This is the same throughout the Venda people.

The allocation of land in Bend-Mutale is different from that in the other two villages. In Bend-Mutale, a resident looking for land must first identify the land, and then report the intention to occupy land to the ward leader. The ward leader will report the matter to the headman and the civic organisation. Representatives of the village council and the civic organisation will be sent to inspect the land in question. If the headman is satisfied, the applicant is given written permission without any payment. The size of the plot is not important as long as all the requested land is utilised. The role of the civic organisation in this matter is not clear.

Non-residents request land directly from the headman who reports the matter to the village council and the civic organisation. As there is always enough land available the outsider is required to pay a levy determined by both the village and tribal council, and the land is his. The same procedure is followed when a non-resident is bringing cattle into

the village. Cattle will have to stay in quarantine camps for a specified period before being allowed into the grazing camps.

Land allocation in Ha-Nkotchwi and Musunda is more organised than in Bend-Mutale. Land allocation in these villages is done on specified pre-announced dates. This takes place after land to be allocated has been planned and charted by agricultural officers. Residents are given the first preference. Non-residents pay a fee that is determined by the village council depending on the size of land. The process of importing cattle into the village is the same as that of Bend-Mutale.

Several customary rules and taboos govern the utilisation of natural resources. Disobeying these rules is said to bring about misfortune and disasters to the individual, the household or the community as a whole. The collection of medicinal plants is governed by procedures, which, if not followed, may weaken or nullify the medication. For instance, the bark from *Securidaca longepedunculata* is removed only from the western side of the stem (to avoid ring-barking), wood of *Lannea stuhlmanii* is not collected for firewood as it invites evil spirits into the homestead and firewood collected from sacred groves or forests invites poisonous snakes into the homestead.

3.8.1 Analysis

The tenurial systems that operate in the three rural villages are centred on the authority of the headman. The success of this arrangement lies heavily on the management style and the exercising of authority that the leader wields over his subjects. Adverse political and economic climate may lead to a breakdown of this system. Matose and Wily (1996) suggested that open access regime might develop because of the breakdown of a management system whose purpose is to enforce regulations aimed at controlling the resources under one or other property regime. The challenge of democratisation that traditional leaders face in South Africa is just but one example. In the three villages, however there is already a very thin line between common property and open access regimes in spite of the presence of an authority system. The status of tenure in the three

villages may change however if the resources that are presently available may start limiting. Under present conditions and climate, however the tenure system in place is effective enough to ensure sustainable use of the natural resources in the area.

3.9.The value of natural resources and their products

The determination of the value of resources was restricted to the range of products that are regularly used by household. These are mainly processed forest based products. The values of other forest-based resources and products that do not require processing or not sold, such as livestock fodder and construction materials, were not included. These results are summarised in Tables 3.13. and 3.14.

Apart from bartering and lending within the village households, most of the products that are produced in the three villages are sold in markets, in neighbouring villages or locally within the villages. Locally, the prices of most of these products are not fixed and are determined by the financial status of the buyer or the relationship between the seller and the buyer. Market prices however are high and may even be inflated.

Fuelwood is not sold within the villages. It is sold to private and business people who buy wood in large quantities. Villagers collect wood per order and they are paid per vanload. The price reflected in the table below is the charged in wood and coal businesses. Products such as drums and other artefacts are highly valued and are usually sold to foreign tourists and hospitality businesses in urban markets. Thatch grass in the area is of good quality and is harvested mainly for household maintenance, battered or sold locally or in neighbouring villages.

The harvesting of mopane worms provides a good source of income during good-yield seasons. These are sold locally in 340ml cans and in bags for urban markets. The average price of a bag of well-processed mopane worms is R400.00 in urban markets.

Table 3.13. Summary of the utilisation trends natural resources, forest based crafts and other products in the three villages in the Northern Province. Bartering refers to the exchanging of products among neighbours. **Social lending refers to the practice of lending products to neighbours for use for a short period.

Product/ craft	Village	Gender of producer / collector	Sales	Own household use	Barter*	Social lending**
Fuelwood	Bend-Mutale	Men women and children	X	X	-	
	Ha-Nkotzwi	Men women and children	-	X	-	
	Musunda	Men women and children	X	X	-	
Traditional drum (Ngoma)	Bend-Mutale	Men	X	-	-	X
Small drum (Murumba)	Bend-Mutale	Men	X	-	-	X
Artefacts	Bend-Mutale	Men	X	-	-	-
	Musunda	Men	X	-	-	-
Pestles	Bend-Mutale	Men	X	X	-	X
Mortars	Bend-Mutale	Men	X	X	-	X
Cooking spoons	All villages	Men	X	X	X	
Cooking whisks	All villages	Men	X	X	X	-
Hoe handles	Bend-Mutale	Men	X	X		
	Musunda	Men	X	X		
Axe handles	Bend-Mutale	Men	X	X		
	Musunda	Men	X	X		
Sleeping mats	Bend-Mutale	Men & women	X	X	-	-
Wooden baskets	Musunda	Men	X	X	X	X
Food trays	Musunda	Men	X	X	X	X
Food baskets	Bend Mutale	Women	X	X	-	X
Washing baskets	Bend Mutale	Women	X	X	-	-
Marula beer	All villages	Women	X	X	-	X
Palm wine	Bend-Mutale	Women	X	X	-	X
	Musunda	Women	X	X	-	X
Brooms	All villages	Women	X	X	-	-
Thatch grasses	Bend-Mutale	Men & women	X	X	X	-
	Ha-Nkotzwi	Men & women	-	X	X	-
	Musunda	Men & women	X	X	X	-
Mopane worms	Bend-Mutale	Men & women	X	X	-	-
	Ha-Nkotzwi	Men & women	X	X	X	-
Other insects (locusts and termites)	Bend-Mutale Ha-Nkotzwi Musunda	Women and children	-	X	-	-

Table 3.14. Quantities and market prices of woodland products produced or used in the three villages in the Northern Province. Values were obtained from household surveys and market analysis carried out in the villages and in Curio-shops in Thohoyandou. 1- not sold or bought locally. 2- products not available in urban markets.

Product	Village	No. of house hold producing the resource	Percentage of households producing or	Mean quantity produced per household per year \pm Sd	Cost involved (SA Rand)	Market price per item (SA Rand)
Fuelwood (kg/yr)	Bend-Mutale	24	100	5546 \pm 1224 kg	- ¹	200 / 1 Ton van load)
	Ha-Nkotzwi	15	100	3424 \pm 731 kg	- ¹	
	Musunda	23	100	6478 \pm 2116 kg	- ¹	
Traditional drums	Bend-Mutale	1	4.2	3	2000	\geq 6000
Small drums	Bend-Mutale	1	4.2	6	200	\geq 750
Pestles	Bend-Mutale	1	4.2	8	200	320
Mortars	Bend-Mutale	1	4.2	10	150	240
Cooking spoons	Bend-Mutale	3	12.5	24.6 \pm 6.2	25	30
	Ha-Nkotzwi	2	13.3	18.5 \pm 4.5	25	
	Musunda	4	17.4	19.25 \pm 8.1	20	
Cooking whisks	Bend-Mutale	3	12.5	27 \pm 9.4	15	25
	Ha-Nkotzwi	2	13.3	20.5 \pm 3.5	15	
	Musunda	4	17.4	16.5 \pm 8.8	12	
Hoe handles	Bend-Mutale	3	12.5	6.3 \pm 2.4	25	25
	Musunda	2	8.6	6.5 \pm 2.2	20	
Axe handles	Bend Mutale	3	12.5	4.3 \pm 1.6	10	- ²
	Musunda	2	8.6	4.5 \pm 1.5	10	- ²
Sleeping mats	Bend-Mutale	2	8.3	13.5 \pm 2.5	35	60
Wooden baskets	Musunda	2	8.6	3.5 \pm 1.5	50	130
Food trays	Musunda	2	8.6	5.5 \pm 4.5	40	100
Food baskets	Bend-Mutale	2	8.3	15.5 \pm 3.5	20	60
Washing baskets	Bend-Mutale	2	8.3	8.5 \pm 2.5	- ¹	100
Brooms	Bend-Mutale	3	12.5	12.5 \pm 3.6	5	10
	Ha-Nkotzwi	3	20	7.3 \pm 3.4	5	
	Musunda	1	4.3	31	5	
Thatch grass (bundles/season)	Bend-Mutale	19	79.2	112 \pm 53.4	3 / bundle	- ²
	Ha-Nkotzwi	15	100	121.7 \pm 34.6	3 / bundle	- ²
	Musunda	21	91	137 \pm 36.8	2.50 / bundle	- ²
Mopane worms (bags/season)	Bend-Mutale	22	91.7	3.4 \pm 3.3	2 / 340ml can	400/bag
	Ha-Nkotzwi	13	86.7	4.2 \pm 2.1	2 / 340ml can	

3.10. The status of community forestry in the study area.

Interviews with agricultural extension officers and Department of Water Affairs and Forestry (DWAF) officials revealed that there is a Local Government Community Forestry Plan that was formulated by the Provincial Government. This plan however 'was not yet finalised' during the time of the study. The Local Government Office of community forestry was unable to provide any information about envisaged plans or programs. The impression that was conveyed was that there is no workable plan in place, that could be urgently implemented in the rural areas such as those in the study area.

Provincially several plans and strategies that have been formulated involve among others community forestry as their implementation tools. These plans include the Growth and Development Strategy (adopted in 1997), the Integrated Sustainable Rural Development Strategy (a ten year plan 2001 – 2010) and The Northern Province Integrated Rural Development Framework. These plans included programs such as Community Producer Centres, Sustainable Livelihoods Program, Rural Poverty Alleviation and Community Gardens. According to the report released in 2001, these programs have not been satisfactorily implemented in spite of having an allocated budget of R17 045 000 (N. Province Gov.2001). None of these programs was targeted at the region in which the study was carried out and none of the Local Government officials and extension officers interviewed knew about them.

3.11. Conclusion

The results that have been presented in this chapter covered all the objectives of the study and attempted to sufficiently answer all the research questions that were asked in the introduction part of this thesis. The information that was provided by the villagers during exercises was cross-checked during interviews with key-informants. Information that involved the KNP and Local Government Departments was obtained through informal discussions with rangers, Park Gate officials and officials from the government.

Chapter 4. Major Findings, Recommendations and Conclusion

In conformity with its objectives, the study has made it possible to assess the situation regarding the contribution of natural resources in the livelihoods of the three rural communities. This study is necessarily only a rough one, given the abundance of the information to be handled and the time required to collect data. The study has, however, proved sufficient to identify the main lines of action that may be taken to alleviate poverty and raise the socio-economic status of the three communities.

The first conclusion that can be drawn from the study is that the information available on the parameters of natural resources utilisation and their contribution to livelihoods of rural communities is sufficient to enable difficult situations to be identified and actions launched while more detailed information that is still necessary can be gathered when the programmes of action are being designed.

The information in the study not only defines the nature and magnitude of the utilisation of natural resources accurately, but also provides a clearer picture of the impact of changes on the availability of particular goods and services and of the ways in which people respond to such changes.

4.1. Major findings

4.1.1. Patterns and extent of the utilisation of natural resources

The first finding of the study is that the degree of dependence of the community on natural resources is related to the economic status and the level of infrastructural development of the village. A village that is economically better and with better access to transport such as Musunda tends to be less dependent on natural resources than Bend-Mutale and Ha-Nkotzwi. Lower-income households depend proportionally more on the consumption of wild foods and wild goods than do higher-income households, as these households are able to allocate higher shares of their income to purchased goods and

food. This is also supported by McGregor (1995) and Clarke *et. al.*, (1996). As an example, the building of dwelling structures using wood, in Musunda village, is being replaced by clay bricks, thatched huts are being replaced by corrugated iron and the use of indigenous wood for household fences is being replaced by the use of treated commercial timber.

The dependency of communities in the three villages on forest natural resources for their livelihoods varies according to their uses. Livestock forage and fuelwood are the main uses of woodland products in all the three villages more so than all the other uses. The quantity of livestock in the study villages confirms the availability and usage of forage. Livestock feed is also provided from crop residues. Green mulch gathered from trees off farm to increase soil fertility was not recorded in any of the three villages.

High fuelwood use is attributed to lack of alternative energy sources in the villages and dry wood abundance (especially *C. mopane*) in woodlands surrounding the villages. Best, (1979) and Gandar, (1981) have noted that the quantity of fuelwood consumption is linked to its availability and the most used species in all the villages was *Colophospermum mopane*, which is the dominant tree species in the region. The use of fuelwood is also influenced by the fact that fuelwood is particularly suited to its users as it is easier to access, and can be gathered and used by simple techniques without the recourse to expensive equipment (FAO, 1983).

The communities in the three study villages do not regard conserving fuelwood supply as a top priority. They are concerned with many other acute survival problems and give immediate priority to the problems of water, food and cash income. This may be due to the abundance of deadwood in the woodland close to settlement areas and the ease with which it is collected. The supply of energy for wood and the negative consequences of excessive collection and the resulting deforestation are not seen as an important priority. This may continue until degradation has become so serious as to be practically irreversible. The availability of donkey carts has led to increased collection of resources such as fuelwood and construction wood from areas farther from the villages collected by both male and female members of the community. The sale of fuelwood in vanloads has increased the quantity of fuelwood harvested in the area.

Several trends that were described by Campbell in Clarke *et. al.*, (1996) as caused by the quest for labour-saving strategies and the desire to be modern were observed in the study. These

include the increased use of exotic trees for construction, the purchasing of fuelwood and modification of building styles to less wood consuming structures. Contrary to Campbell's view, the above trends were not driven by deforestation in the three study villages. Better transportation enables residents to transport processed goods from outside the villages hence the reduction in the dependency of communities on natural resources.

The consumption of wild food in the study villages is not significant. The study shows that wild fruit does not replace staple diet as a meal in all the three villages but it is consumed as a snack by members of the households, especially children. The collection of wild fruit for household consumption in the study villages has decreased as more people in the villages resort to exotic fruit such as banana, apples and mango (also noted in Zimbabwe by McGregor, 1993). The role that wild food plays in house hold nutrition has changed with the penetration of rural markets by new food products and with changing tastes (FAO, 1991). Commercial foodstuffs such as bread, tinned or packed foods sold in local shops, and modern garden vegetables such as tomatoes and other exotic spinaches grown or bought locally or in urban centres have reduced the demand for traditional wild food. The worst impact of this is that poorer people's dietary quality, diversity and food option are reduced.

The spread of evangelical Christian sects in the study villages have had some influence on the utilisation of natural resources by the villagers. The most significant impact was in Ha-Nkotzwi where villagers claimed they do not use traditional medicines as it is against their Christian belief. In other villages however, despite the presence of different churches in the villages there was no significant impact. The churches' influence however seemed to have less influence on the consumption of certain wild foods by converted villagers than what was described by Clarke *et al.*, (1996).

4.1.2. The role of gender in rural daily activities

The study has found that the division of household duties in an ideal household in the three study villages results in equal loads of duties to both men and women. The analysis of daily routines and seasonal calendars reveals that although women and girls seem to be doing more of the domestic chores than men, the difference in the overall amount of workload is not significant. For example, men do the preparation and ploughing of fields and women join the men during the planting, weeding and harvesting of crops and the chores of herding, milking and the

maintenance of livestock are carried out by men. Chores that are done by men and boys are more strenuous than most of the chores that are carried out by women. Women are able to collect several resources in a single trip due to the lightness of the chores that are culturally feminine. Women are able to collect wild vegetables on their wood or dung collection trips (pers. ob.). Results in Table 3.5. to 3.8. show that men collect more NTFPs than women do. This differed from the report by Shackleton *et. al.* (1999) that showed that women gather and process more non-wood resources than men.

The establishment of women clubs in Bend-Mutale and Musunda has contributed towards empowering women in the villages. In both villages, women are predominantly in charge of the projects that have been initiated by the regional Development Board and the Agricultural extension officers such as the manufacturing of handicraft and planting of fruit trees in the established community orchards. Women tend to be more willing to participate in village projects than men are. Women clubs have encouraged women participation in village activities they were previously not encouraged to participate, such as the local tribal meetings.

4.1.3. Natural resource management

The role of traditional management practices in the management of natural resources is significant in ensuring sustainable utilisation of resources. The customary practices and taboos are still being respected and observed. Rural people in the study villages still practice traditional management practices such as the conservative use and selective maintenance of particular species (as in the harvest of medicines and maintenance of species such as *Adansonia digitata*), the management of resources by taboo and religious functions, and the prohibition of harvesting and utilisation of some resources before the headman's decree (such as the collection of marula fruit and mopane worms), that ensures equitable and sustainable utilisation of resources. These practices have also been noted by Shepherd (1992) and Clarke *et. al.*, (1996).

Traditional leaders in the three study villages still effectively and successfully enforce the full spectrum of woodland management in their areas. This is, in contrast to modern wildlife management approach, is not militaristic but based on the customary practices of respect towards traditional leaders and an understanding of why the regulations are in place. The tendency of villagers to illegally collect natural resources in protected state areas such as in the KNP is a

result of top down management approach. This tendency has been reported by Matose (1996) in Zimbabwe where villagers deliberately used wasteful and destructive methods of harvesting in retaliation to what they consider as unfair and unnecessary harassment from state officials and park rangers. The effect of removing control of natural resources from traditional local level to the state has overall been one of the causes of poor natural resources management.

4.1.4. The value and potential of woodland-based resources in alleviating poverty

The study has revealed that there are several woodland-based products that rural communities can process and derive substantial income (see Table 3.15.). As there is little input required to process these products the communities benefit substantially through their sale in urban markets.

Seasonal calendars (Table 3.12) have shown that the products that are sold are collected or produced in different times of the year. They therefore can ensure a steady income from different times of the year to the communities. As most of the villagers in the three communities are not formally employed, they have a lot of time available to produce or collect these products. Most of the products are collected or produced by both men and women and therefore benefit all sectors of the community.

4.1.5. The contribution of agricultural and non agricultural activities to livelihoods of communities

The contribution of crop production towards rural livelihood is high in the study villages. Maize which is the main crop is produced by more than 70% of all the households in the three communities followed by groundnuts, sorghum and millet. As surplus produce is sold or bartered, crops such as groundnuts and maize provides a substantial amount of cash flow and other necessities into the households. The storage of surplus produce also ensures continuous supply of food and cash in between the seasons.

Livestock production contributes less towards rural livelihoods in the area. Sale of livestock, especially cattle, is very rare except in cases of financial emergencies or in times of drought. The only livestock product that is sold is cow-milk. Pigs sheep and goats are sold to locals and outsiders but do not bring in a lot of income. Livestock production, however contributes

significantly, albeit indirectly, to villagers who are employed to look after them, either by locals or by those outsiders who bring their livestock into the area.

4.1.6. The status of community forestry in the study area

Provincial Community Forestry Sub-directorates that are in place in South Africa are failing to implement programmes aimed at poverty alleviation, which is one of the main objectives of community forestry. There are several programmes and strategies that are aimed at alleviating poverty in the rural areas, but these are not being implemented, let alone being communicated to the target people. Though community forestry is a new approach in the alleviation of poverty in South Africa, it has always been a way of life in rural areas. In spite of this, local governments, specifically in the Northern Province, are failing to put in place mechanisms to harness the potential of community forestry towards poverty alleviation.

Failure of planned community forestry programmes cannot be blamed on the lack of resources (as it is always the case when Governments are failing to deliver services) as millions of funds have been allocated towards poverty alleviation (see section 3.10). There is an urgent need to bridge the gap between the development of policies, plans and programs by the government and their implementation on the ground.

4.1.7. Conflicts that affect the livelihoods of communities

4.1.7.1. The conflict between the communities and governing institutions in the villages

The relationship between communities and the traditional governing institutions such as chiefs and Traditional Authorities varied from village to village but was generally poor. Autocracy, which is a trademark of most traditional structures, and the lack of transparency, is not acceptable to civic organisations that are based on democratic principles. Lipton *et. al.*, (1996) noted the same situation in the rural Potgietersrus area in the Northern Province. The local government operates within the circles of civic organisations in the rural areas, and villages with established civic organisations are kept in contact with the government, as is the case in Musunda. The tribal authorities regard civic organisation as a threat to their authority and always tend to oppose most of their actions. This conflict results in internal conflicts that hamper

progress in the development of the villages, delivery of services and the proper management of natural resources, as is the case in Bend-Mutale.

The three villages are infrastructurally underdeveloped. Of the three villages, Musunda village is the only village with a planned settlement area and better roads. Bend-Mutale and Ha-Nkotchwi villages have little or no planning and the roads are not maintained. The businesses in the villages are informal and are mainly spazas (informal shops) with the exception of a shop in Bend-Mutale. Children in the three villages have to travel long distances for their secondary education. Ha-Nkotchwi village becomes inaccessible when the Mutale River overflows, as there is no bridge. These are just some of the many socio-economic problems that the communities in the three villages are experiencing, which planned government poverty alleviating programs should address.

4.1.7.2. Conflict between the communities and the KNP

The conflict between the communities in the three villages and the Kruger National Parks authorities was evident during discussions held with villagers in the three villages. The conflict involves access into the park and the crises of problem animals.

As described in the history of the three villages, the communities in the three study villages have their origins in the Kruger National Park. As all of them were moved from within the Kruger National Park either forcefully in the case of both Bend-Mutale and Ha-Nkotchwi or voluntary as the Musunda community did during the establishment of the Park, there are families who have their ancestral graves and other sacred places within the park and access to these places is important to them. Traditional customs require regular visits to these sites to appease ancestral spirits. They have no access to these areas as gate fees are high and it is against regulations to walk on foot in the park. Their visits into the Park would require an armed ranger to protect them against predators. The villagers have appealed to the tribal authorities for the matter to be addressed with the KNP authorities but to no avail.

The communities in Bend-Mutale and Ha-Nkotchwi are experiencing problems with lions, buffalo, elephants and hippopotami that cross the Park fences into the villages. Villagers are warned not to approach the animals but authorities do not respond in time. Elephants and

hippopotami terrorise villagers working in the fields, and damage and destroy their crops. Lions sporadically attack cattle in Musunda village and the villagers cannot protect themselves and their property from these animals. The rangers that are supposed to patrol the fences are not effective. This means that an opening in the fence might go unnoticed for days on end, with the lions coming into the village nightly. The escape of buffalo from the park into the woodland around the villages, results in rounding up all livestock for fear of getting them contaminated with bovine TB and foot-and-mouth disease. Once the cattle are infected, the authorities may eliminate whole herds in the village. There is no compensation for livestock that is attacked or infected. Destruction and damage of crops may result in the poaching and killing of animals in self-defence and to compensate for their losses (pers.comm).

Villagers in the study area are poaching wildlife from the KNP. This is a regular activity. Many hunters poach for meat and others for the sport and thrill of the hunt. Although smaller game is targeted, bigger game like hippopotamuses, buffalo and elephants also fall prey to snares and have to be put down. If this is not addressed, the activity may escalate and more animals are going to be lost.

4.2. Recommendations and conclusion

The study has demonstrated once again the specific nature of the situations, problems and room for possible solutions. It has provided a basis for the reflection on the strategies and actions to be employed. It provides indications on the actions to be taken, while making it clear that a combination of actions affecting various parameters of supply and demand of natural resources towards rural livelihoods will in practice always be necessary. This approach highlights the following important points:

The geographical location of the three study villages offers the communities in the villages many economic opportunities, however villages are not conscious of the potential that exist in their villages in terms of tourism. For example, the potential of Bend-Mutale village to benefit from the influx of tourists that visit the Kruger National Park through the Pafuri Gate was not considered as a viable option before this study. After discussion with some of the craftspeople in the village, it became clear that all that is required to tap into the tourist market might be a stall next to the main road where all village attractions can be displayed. The Makuya Park camp is found in Ha-Nkotchwi, and tourists could be advised to visit the settlement, or villagers who are able to produce curios, carvings and other traditional products can be encouraged to trade with tourists in the Park camps.

Bend-Mutale and Ha-Nkotchwi have high stocks of mopane worms that attract many collectors from everywhere. As this resource appears for only two months in a year, there is potential to change this activity into an income-generating project. Firstly, the outsiders may be charged a fee to gain access to the resource, as it is currently the practice in white owned farms in the region. Secondly, due to lack of accommodation around the mopane woodland, outside collectors have to drive to and from the forest every day and have to pay transport costs. Further income may be generated from offering accommodation to the collectors. Thirdly, the spines on the worms and the chemical released during the degutting process inflict painful damage to the collectors' hands. This results in fewer worms collected per person per season.

Research is required into the development of technology that may maximise the harvest and processing of natural resources such as mopane worms. The introduction of technology in the production and processing of non-timber forest products may significantly increase the incomes

and employment of rural low income people while preserving the ecological sustainability of the resources. This include equipment, tools, processes, products and systems for converting inputs into outputs and distributing and using outputs for consumption. Technology introduction increases productivity, improves product quality, increases local self-sufficiency and develops local skills.

The production of marula and palm wine has the potential of generating additional income if produced and marketed. The two drinks are quite popular in the eastern Lowveld of the Northern Province. The exclusivity presence of palm stands in the study area can add value to the production of palm. The low input in the brewing of these drinks may result in substantial income for residents in these villages.

The importance of natural resources, especially fuelwood for energy in the study villages makes it necessary to revise the conditions for access to the resources especially by outsiders. This must be controlled, but at the same time guarantee supplies. The inflexibility of, or changes in, land tenure structures must not constitute a major growing obstacle to access to natural resources. Very serious attention should therefore be given to the accessibility and distribution of these supplies. The legislative and regulatory framework must evolve in the direction of no longer closing the natural resources in the woodlands to the people dependent on it but making community forestry part of land use planning in order to meet their needs and help in their development.

Integrated conservation and development projects (ICDPs) should be introduced as a way of protecting both the levels of biodiversity as well as human interests within the communities neighbouring KNP. These projects curtail the illegal harvest of protected resources in the Park in exchange for material benefits, often in the form of alternate sources of income and sustenance. ICDPs have proved to be successful in Duru-Haitemba in Tanzania (Wily, 1995). Traditional management practices that govern the use of natural resources in the rural areas are part of the culture and tradition. The conservation of natural resources in the villages is not seen as a foreign concept but rather as a way of life that ensures future access to the same resource (Shepherd, 1992). Communities tend to ignore rules that are imposed without explanation or rules that come from an institution that is regarded as insensitive to the welfare of community, in this case the National Parks Board.

Many technical details of local knowledge and systems of natural resource management (LKMS) are still viable and can be used to develop locally appropriate solutions to environmental problems. For example, the traditional range management system, such as livestock rotation schedules and deferment periods can be modified with modern or Western range techniques to develop a system more appropriate to local conditions. LKMS can be useful in environmental programs, such as identifying when and how local people have to change their resource exploitation to avoid or minimise environmental damage.

This study and other recent studies have shown women's potential impact at the utilisation of natural resources, both in terms of collection and at the production level. Therefore, women in rural communities must be systematically considered as a dynamic element in decision-making and action at all stages of community forestry programmes, because of their energy and their normal active role in traditional societies.

The relationship between the village communities and the Local Government in the rural areas need to be reviewed by the South African Government. The purpose of the Local Government as stated in the South African Constitution, is to bring the government closer to the people. The development of policies and programmes aimed at alleviating the lives of the rural poor is useless if there is no contact between the rural people and government officials. The government need to communicate policies and projects with the target groups, listen to their views and concerns and where possible, address them before pushing forward with the implementation process. The villagers should be visited regularly to listen and to address their problems.

Forestry initiatives alone cannot alleviate the quality of life in the study villages. Assistance should be given to communities especially women, to investigate the possibility of generating forest-based income-generating activities based on their collective skills. Multi-departmental involvement is required from a number of Government departments including Education, Health, and Water affairs to help increase the viability and well being of these communities. There is a need to build on the strengths of each of the communities, their livelihood patterns, their diversity and adaptability, and examine opportunities that will add value to their capital assets.

When communities appear to be lacking in one of the five capital assets, it is necessary to probe with them the extent to which this factor prevents their success. Similarly, if the communities are

particularly well endowed in one area but are still unable to achieve positive livelihood outcomes it is important to understand what the critical missing assets or undermining structures and processes are. As Carney (1998) suggested there should be a strong emphasis on institutional analysis and the drawing up of inventories of existing structures and processes that impact upon the people's livelihoods.

There is a need to develop community forestry human resource capacity in Local Government level, especially those whose task is to formulate and develop policies programmes aimed at alleviating poverty in the rural areas. Community forestry has been proven around the world to be a successful vehicle in raising the living standards of poor rural people. Community forestry approaches are participatory and community based and help to guide policy makers. The use of participatory methods in the studying the livelihoods of communities is important to both the field worker and the target community. While the fieldworker is obtaining information on the role of NTFP in the livelihoods of the communities, the activities also help the community to realise the role that natural resources play in their lives. They encourage communities to make hypothesis and inferences, to see that they can have control over the resources on which they so depend. They learn to appreciate and acknowledge and therefore better manage natural resources.

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APPENDIX A

VILLAGE RESOURCES MAPS

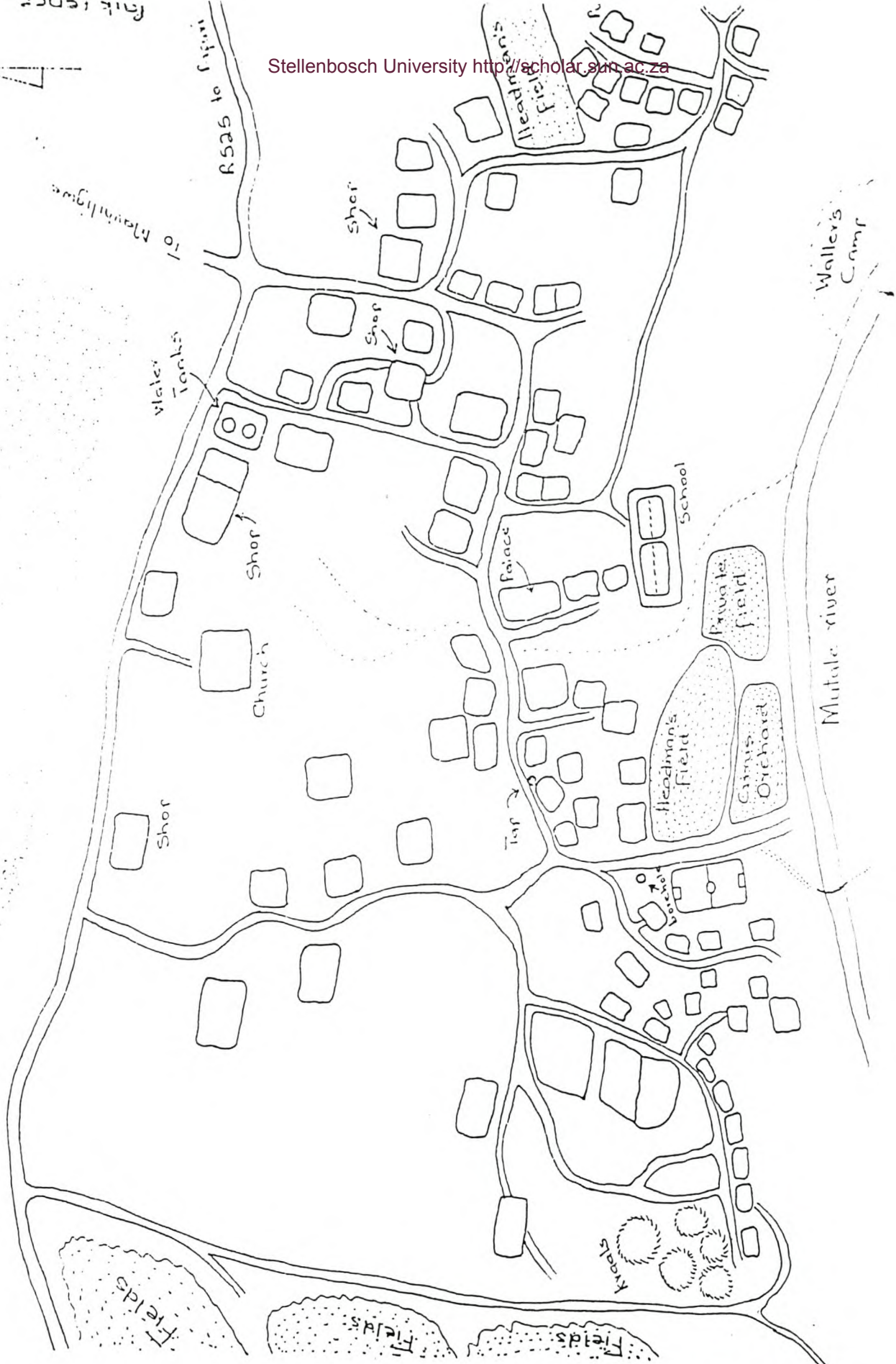


Figure 4.1. Social and resource village map drawn by residents of Bend-Mutale village showing all the different land-uses and the arrangement of households. Map drawn by villagers led by Eric Mulugana.

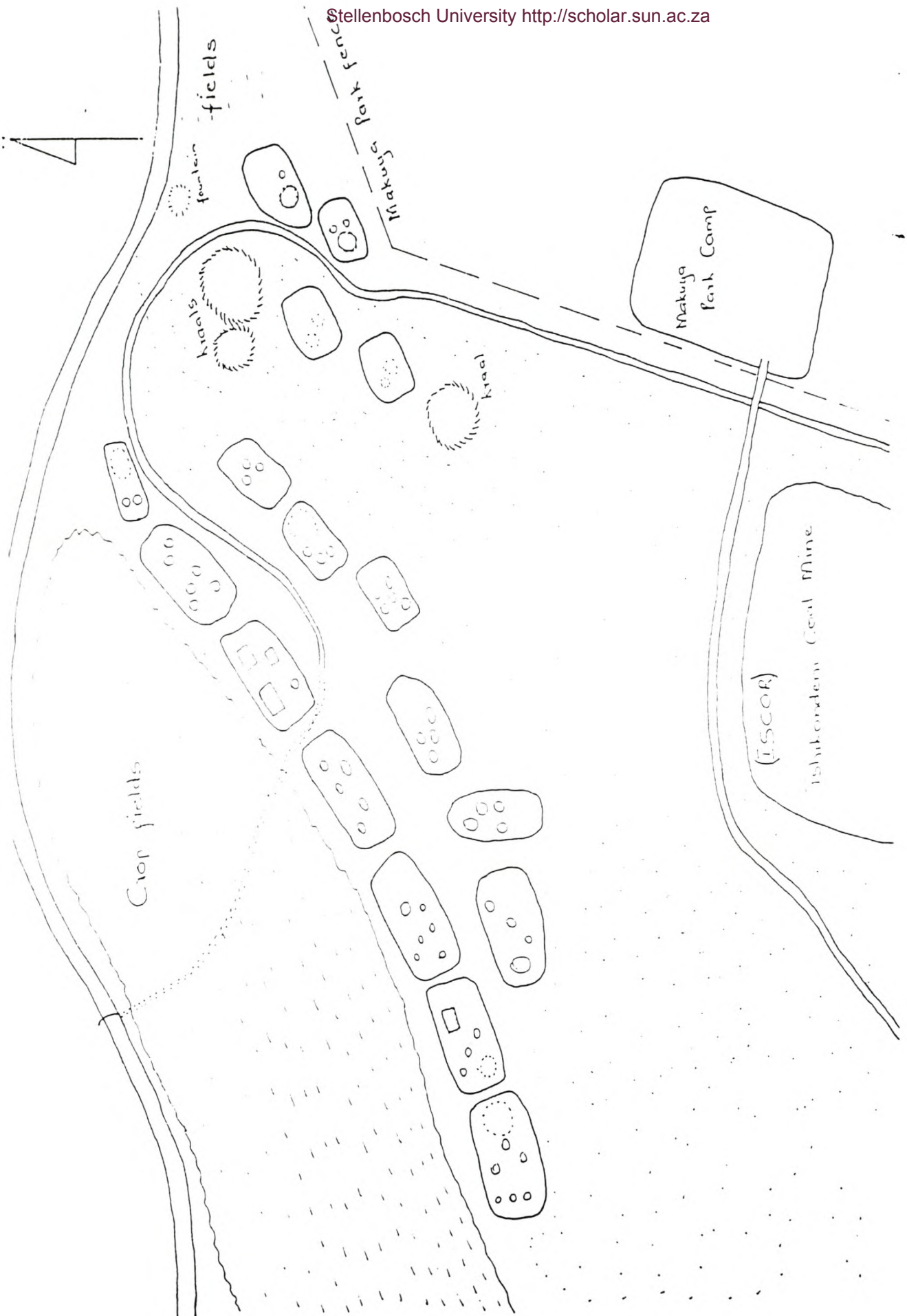


Figure 4.2. Social and resource village map drawn by residents of Ha-Nkotzwi village showing all the different land-uses and the arrangement of households. Map drawn by villagers.

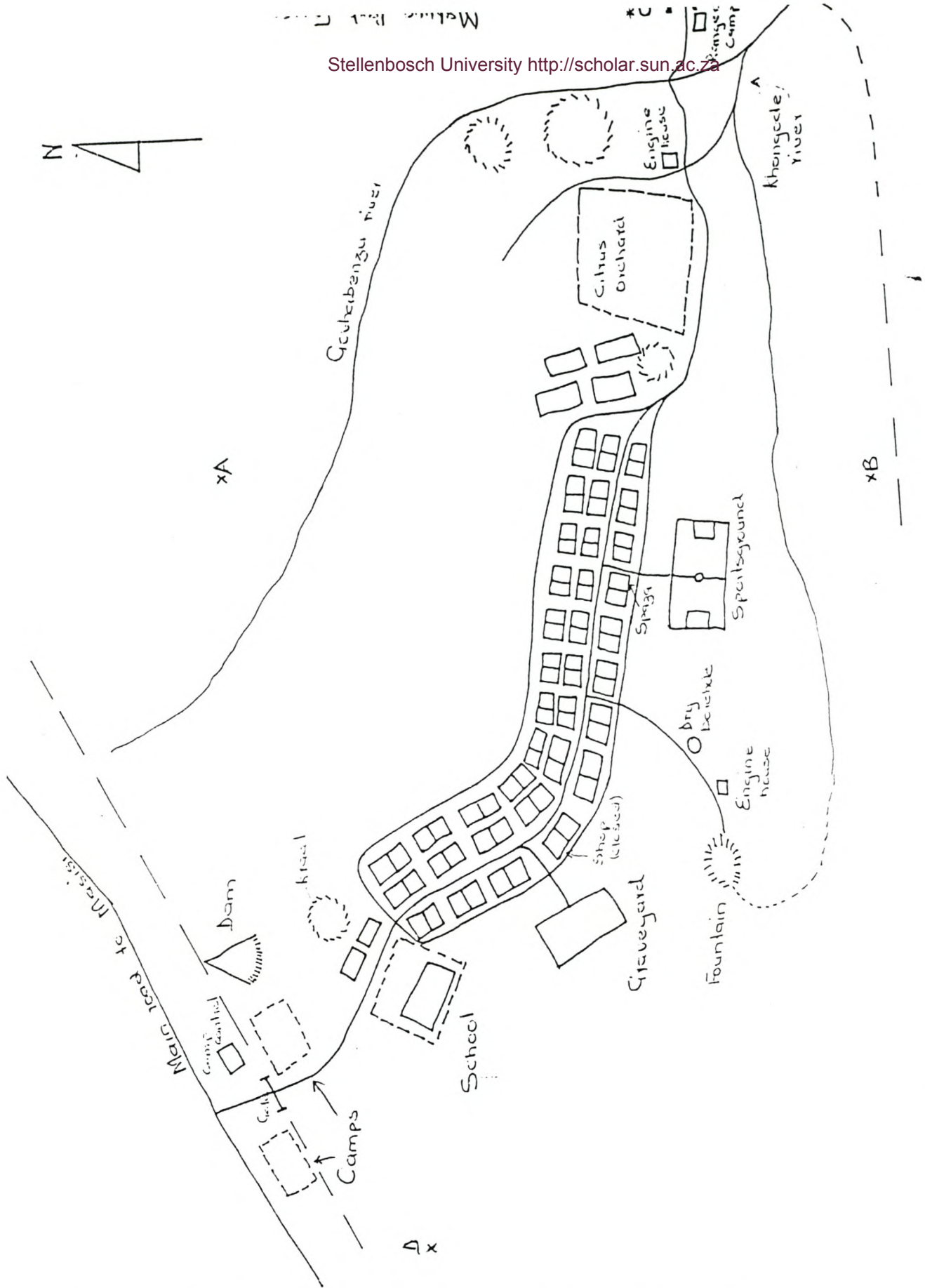


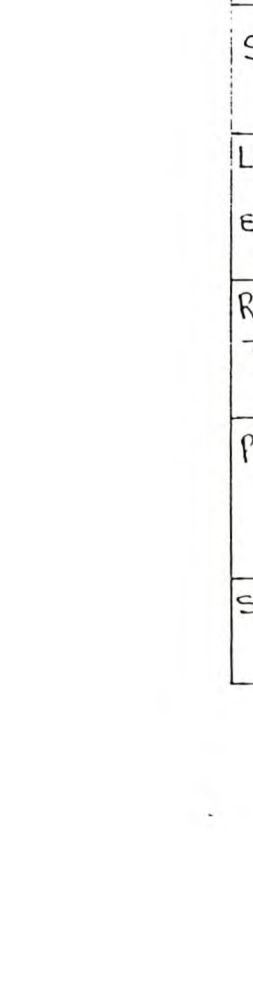
Figure 4.3. Social and resource village map drawn by residents of Musunda village showing all the different land-uses and the arrangement of households. Map drawn by villagers led by Mr Makahane.

APPENDIX B

TRANSECTS OF THE VILLAGES.

Soil & Landscape	R. River	Sand Small stones River banks	Dark sandy loam, fertile soil Flat land	Soil is loamy with small rocks Scatter around villages.	Road	Fertile soil on flat area	Fertile soils due to manure
Land-use & Exploited resources	Fishing washing and bathing Livestock drinking water Swimming	Building sand. Potters clay Soil for decorating walls	Cultivated crops and fruit trees in orchard Wild fruit	Settlement area. Huts and modern houses built among trees (Mainly mopane and acacia trees) Marula trees a	—	Mopane worms Fuelwood, hunting Fruit	Wild vegetables Cultivated crops
Vegetation	—	—	Berberia discolor and Boabab trees Cultivated Crops.	Marula trees left in stands Mopane and acia trees forming shade in households	—	Mopani woodland Marula trees Boabab trees hunting Medicinal plants	Trees for shade and fruit Grazing grass between the fields
Problems	River is polluted	—	Flooded river sweeps away crops.	The place is rock and during heavy rains the soil become too soft and huts are destroyed Small rivulets and pools breed mosquitos	Livestock killed on the roads.	—	Wild animals destroy crops and threaten villagers.
Solutions	Water should be boiled before drinking	—	—	Better structure houses and chemicals for eliminating mosquitos	Speed should be reduced at night	—	Contact the KNP Arm the people

Figure 4.4. Transect of Bend-Mutale village showing the different resource zones The transect walk started at the Mutale river and proceeded to the border fence in the north of the village.



Landscape	Steep with flat areas	Slightly slopy but generally flat.	Flat and slopy towards the east	River	Slopy to flat
Vegetation	Dense woodland with thick undergrowth. tall dry grass. Variety of tree species dominated by Colophospermum and Acacia spp	Sparse boababs and Sclerocarya birrea trees	Orchard with planted oranges woodland		
Soils	Rocky, sand loam to gravel red soil, infertile soil	Dark loam soil fertile	Loam fertile soil	Clayey	very fert clayey lo
Land-use & Exploited resources	Grazing, fuelwood, wild fruit Browse and Medicines Termites	Housing: predominantly traditional huts very few modern house.	Orchard, hunting, honey grazing, browsing, cow dung, medicine	livestock drinking water clay	Browse & grazing honey hunting
Resource Tenure	Open acces communal management	Households, individual/private property. Plants managed by the headman.	Communally owned orchard	Open access	Open acces
Problems	Overgrazing close to camps Erosion dry and infertile soil	Poor quality crops as a result of lack of fe manure	Few residents are working in the orchard. Livestock damaging fences. Pump & not working	Stagnant water breeds mosquito	Lion attack Mixing of ca: with Buffalo
Solutions	Move goats and donkeys to the other grazing camps. Fill the dongas	Spread manure in the fields.	Repair pump. Invite more volunteers.	Spray to kill mosquitoes	Beef up. security by increasin the no of rans

Figure 4.5. Transect of Musunda village showing the different resource zones. The transect walk started at the Makuya Park fence in the east of the village and ended at the livestock control fence in the west

APPENDIX C

VENN-DIAGRAMS OF INSTITUTIONS IN THE VILLAGES.

Legend:

1. Bend-Mutale village community
2. Headman
3. Village Council
4. Traditional (tribal) Authority
5. Local Government
6. Civic organisation
7. Church
8. Development Board
9. Tshikondeni Mine
10. Agricultural Extension Officers
11. Kruger National Park
12. School
13. Citrus project (Women's club)
14. Wallers' camp

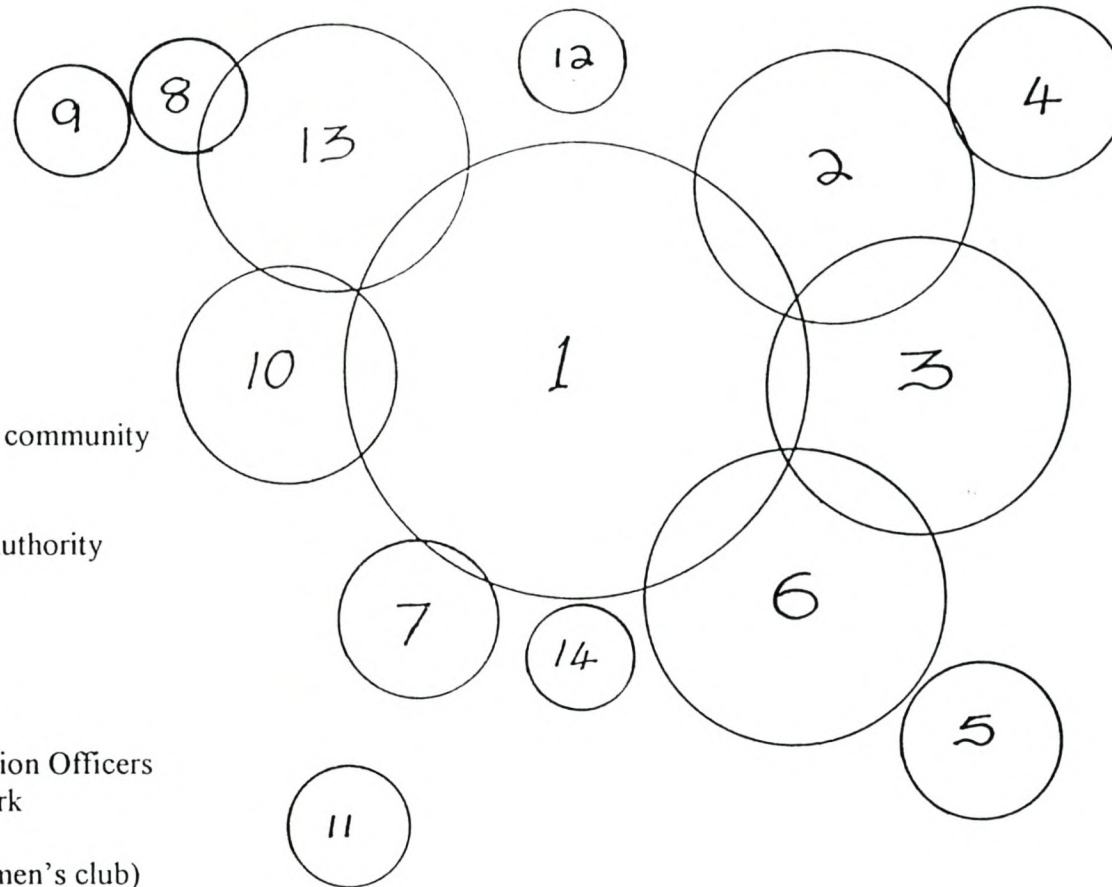


Figure 4.6. Venn-diagram of institutions that are related to the community in Bend-Mutale village. The size, the closeness and overlapping of circles indicate the importance of the institution and how close the institution is to other institutions and to the community

Legend:

- 1. Ha-Nkotswi village community
- 2. Headman
- 3. Village Council
- 4. Traditional (tribal) Authority
- 5. Local Government
- 6. Civic organisation
- 7. Church
- 8. Development Board
- 9. Tshikondeni Mine
- 10. Agricultural Extension Officers
- 11. Kruger National Park
- 12. School

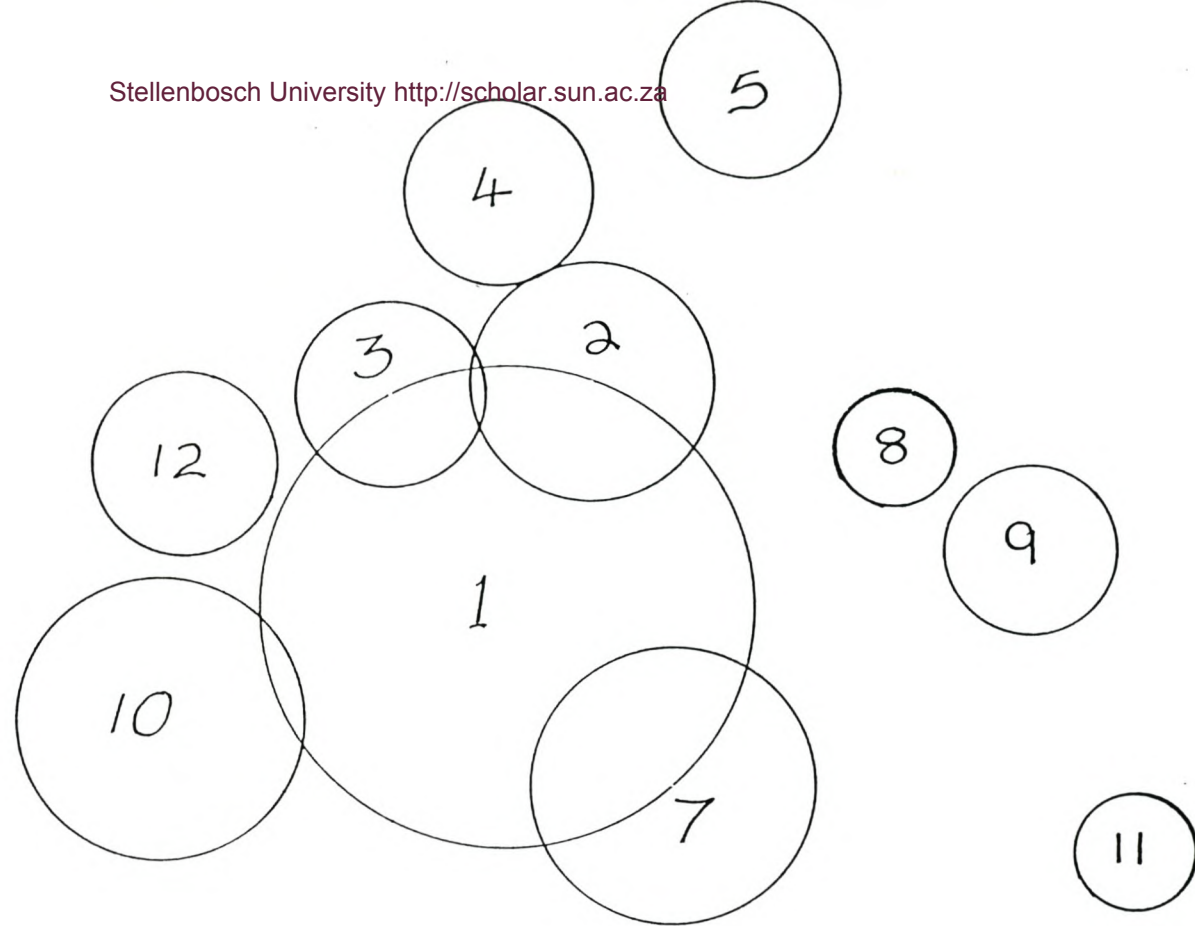


Figure 4.7. Venn-diagram of institutions that are related to the community in Ha-Nkotswi village. The size, the closeness and overlapping of circles indicate the importance of the institution and how close the institution is to other institutions and to the community

Legend:

1. Musunda village community
2. Headman
3. Village Council
4. Traditional (tribal) Authority
- 5 Local Government
6. Civic organisation
7. Church
8. Development Board
9. Tshikondeni Mine
10. Agricultural Extension Officers
11. Kruger National Park
12. Citrus project (Women's club)

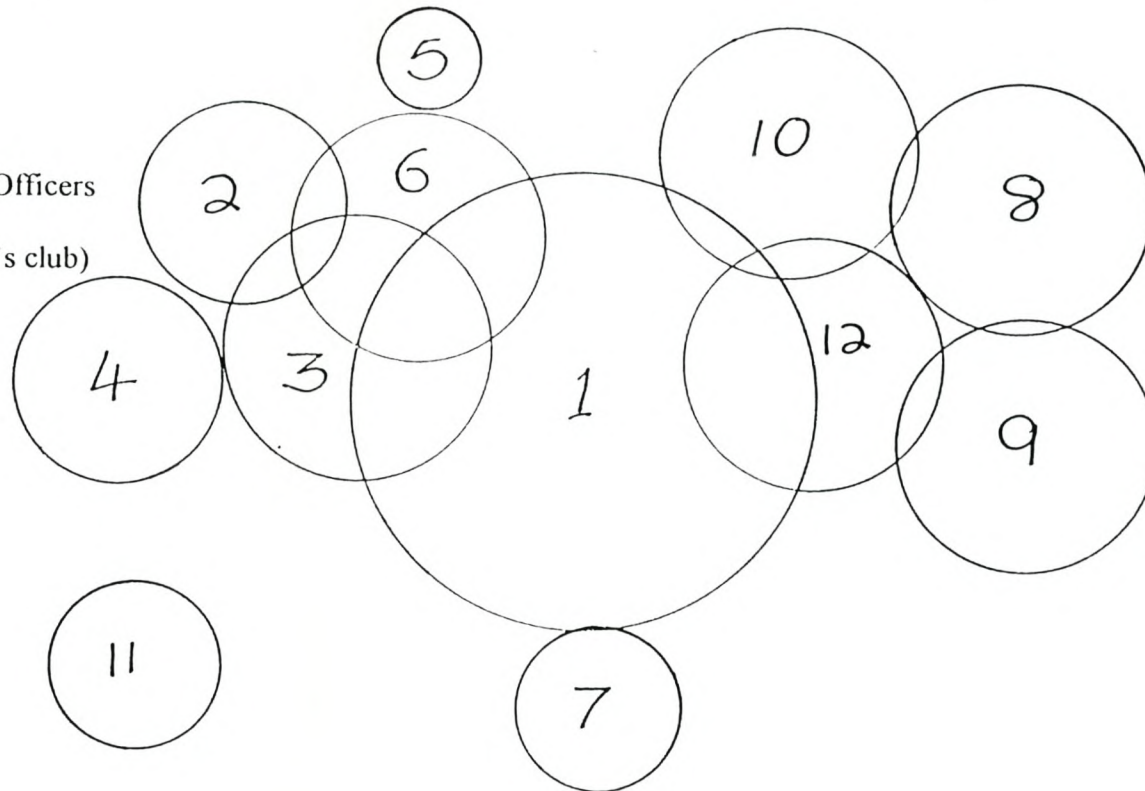


Figure 4.8. Venn-diagram of institutions that are related to the community in Musunda village. The size, the closeness and overlapping of circles indicate the importance of the institution and how close the institution is to other institutions and to the community

Appendix D.

The utilisation of plant based resources from different tree species by community members in the three villages, Bend-Mutale, Ha-Nkotchwi and Musunda, in the Northern Province. (* Denotes plant species whose Latin names could not be ascertained during the study. Village legend: 1 – Bend-Mutale, 2 – Ha-Nkotchwi and 3 – Musunda)

Plant species	Venda name	Food	Drinks	Fuelwood	Livestock forage	Dwelling constructio	Fencing	Medicinal (human)	Medicinal (livestock)	Artefacts/ utensils	Ropes/ fibres
<i>Acacia gerrardii</i>	Muunga				1			3	1, 3	1,2,3	3
<i>Acacia nigrescens</i>	Munanga			1, 2, 3			1, 2, 3	1		1, 2	
<i>Acacia robusta</i>	Muvumbangwena	2						1, 3			1
<i>Adansonia digitata</i>	Muvhuyu	1, 2, 3						1, 3			1, 2
<i>Azelia quanzensis</i>	Mutokota			1, 2, 3	1, 2			3		1	
<i>Albizia versicolor</i>	Mutambapfunda									1	
<i>Androstachys johnsonii</i>	Musimbiri			1	2, 3	1, 2, 3	1, 2, 3				
<i>Berchemia discolor</i>	Munii	1, 2, 3								1	
<i>Bolusanthus speciocus</i>	Mukambana						1, 2, 3			1, 3	
<i>Boscia albitrunca</i>	Muthobi	1, 2, 3			1, 2, 3			1, 3	1, 3		
<i>Cassia abbreviata</i>	Munembenembe				1, 3			1, 3			

Plant species	Venda name	Food	Drinks	Fuelwood	Livestock forage	Dwelling constructio	Fencing	Medicinal (human)	Medicinal (livestock)	Artefacts/ utensils	Ropes/ fibres
<i>Cassine transvaalensis</i>	Mulumanamana		1, 3					3		1, 3	
<i>Colophospermum mopane</i>	Mupani	1, 2		1, 2, 3	1, 2						2
<i>Combretum apiculatum</i>	Mutsingidi/Musingi dzi	1, 2		1, 2, 3						1	
<i>Combretum hereroense</i>	Mugavhi		1, 3							1, 2, 3	
<i>Combretum imberbe</i>	Muhiri			1, 2, 3				1, 3			
<i>Combretum mycrophyllum</i>	Mukopokopo							3			
<i>Combretum zeyheri</i>	Mufhatela thundu					2, 3		1		2, 3	
<i>Cordia caffra</i>	Mushashanda /Duda					1, 2, 3					
<i>Dichrostachys cinera</i>	Murenzhe						1, 2, 3	1, 3			1.3
<i>Diospyros mespiliformis</i>	Musuma	1, 2, 3			3			1, 3	1, 3	1	
<i>Eurphobia ingens</i>	Mukonde								1, 2, 3		
<i>Ficus sycomoros</i>	Muhuyu-lukuse	1, 2, 3								1	
<i>Garcinia livingstonei</i>	Mupimbi							3			
<i>Gardenia volkensii (thunbergi)</i>	Tshiralala						1, 2, 3	1		1	
<i>Grewia versicolor</i>	Murabva									1	

Plant species	Venda name	Food	Drinks	Fuelwood	Livestock forage	Dwelling constructio	Fencing	Medicinal (human)	Medicinal (livestock)	Artefacts/ utensils	Ropes/ fibres
<i>Hexabolus monopetalus</i>	Muhuhuma										
<i>Hyphaene petersiana</i>	Mulala	1, 2, 3	1, 2, 3							1, 2, 3	1, 2, 3
<i>Kirkia acuminata</i>	Mubvumela					1, 2, 3		1, 3		1	
<i>Landolphia kirkii</i>	Muvhungo	1, 2, 3								1	
<i>Lankea stuhlmanii</i>	Mulivhadza							3			
<i>Lonchocarpus capassa</i>	Mufhanda				3	1, 2, 3				1, 3	
<i>Markamia acuminata</i>	Mulakholomo									1	
<i>Maytenus senegalensis /heterophylla</i>	Tshiphandwa	1, 2			1, 2, 3			1, 3			
<i>Peltophorum africanum</i>	Musese			1, 2, 3	1					1, 2, 3	
<i>Phoenix reclinata</i>	Mutshema	1	1, 2, 3							1, 2, 3	
<i>Pterocarpus angolensis</i>	Mutondo							3		1, 3	
<i>Schotioa brachypetala</i>	Mununzvu	1, 3						1			
<i>Sclerocarya birrea</i>	Mufula	1, 2, 3	1, 2, 3			1, 3		1, 3			
<i>Securidaca longepedunculata</i>	Mpesu							1, 3			
<i>Spyrostachys africana</i>	Muonze									1, 3	
<i>Sterculia regersii</i>	Mukakate										1, 3
<i>Strychnos spinosa</i>	Muramba	1, 2,									

Plant species	Venda name	Food	Drinks	Fuelwood	Livestock forage	Dwelling constructio	Fencing	Medicinal (human)	Medicinal (livestock)	Artefacts/ utensils	Ropes/ fibres
		3									
<i>Synadenium cupulare</i>	Muswoswo								1		
<i>Trichilia emetica</i>	Mutuhu							1, 3		1	
<i>Xanthorcercis zambesiana</i>	Mushato							1, 3			
<i>Ximenia Americana</i>	Mutanzwa	1, 2, 3									
<i>Ziziphus mucronata</i>	Mukhalu/Mutshetsh ete	1, 2, 3			1, 3		1, 2, 3	1, 3			
<i>Elephantorriza burkei</i>	Gumbathakha							1, 3			
*	Mukuvhazwivhi							1, 3			
*	Mutate									1, 2, 3	
*	Mudoro	2									
*	Mugeri			2							
*	Mutafu					1					
*	Mutafa					1, 2					
*	Madomela	2									
*	Mabotshelo	2									
*	Mutudza							3			
*	Lutundambevha							3			
*	Masote							3			
*	Rihlangari					1, 2					
*	Ludzima					3					
*	Tshula					3					
*	Tshilungwa					3					