Mpharane Plantation – Access mechanisms, the effect on people´s livelihoods and future benefits

Project Report - SLUSE field course 2013

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Abstract

Forest resources serve as an important component of the livelihoods of rural households in developing countries. The ability to benefit from forest resources are determined by the access rights and management practices of the resource (Ribot and Peluso, 2003). The research objective of this study is twofold; the first is to assess the natural resource condition and benefits of current access mechanisms in the plantation in Mpharane, Eastern Cape province of South Africa, the second is to discuss the impact of access to the resource on people's livelihood. Using the framework of access by Ribot and Peluso (2003) we have identified that there are underlying restrictions to plantation access mechanisms and it can be considered a de facto common pool resource, meaning that the access is free for everyone. The benefits are mostly subsistence goods, supplying basic subsistence needs of firewood for energy use and building materials. The open access and lack of management of the plantation has certain constraints on the potential benefits of the plantation such as perceived levels of crime. These constraints have shaped ideas of future changes in the plantation and two scenarios were identified: The first is increased security, management and fencing by the local community and the second is management by a private company. Institutional constraints should be addressed and an expectation setting in the village should be implemented before changes are made to the resource.

Key words: livelihood diversification, plantation management, access mechanisms, Eastern Cape, South Africa, power relations, interdisciplinary

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1. Introduction

In developing countries forest resources serve as an important element of the livelihood of rural households (Shackleton, 2004). Especially in locations where employment opportunities are low or in situations of increased vulnerability, the forest resources provide a range of benefits to the rural households. Not all benefits are free to use and in fact access to forest resources can be limited by the institutions of structures which control the access (Ribot and Peluso, 2003). This report will use a case area in Eastern Cape, South Africa, to analyse this intertwined relationship between access and benefits in further detail. In South Africa major political changes has occurred which have fostered power shifts and influenced access and management of forest resources (Owen and van der Zel, 2000). Land rights were traditionally organized through chiefdoms, in politically autonomous groups (Bennet et al., 2012). Colonialism brought state control, which supported traditional structures in an increasingly authoritarian and decentralized manner through the apartheid eras. Following the abolishment of apartheid in 1994, much of this state apparatus was removed in former homeland areas, leaving the status of land tenure and management arrangements unclear. The result is that the overall control over communal areas remains contentious in these areas. This report will address how a small plantation in rural South Africa is managed and how the management and access mechanisms affect the local people's livelihoods. First the site will be introduced, second the theoretical framework of analysis will be explained and finally this leads to the problem statement and research questions of the report.

1.1 Site description

The forest resource which will be the area of research is a small plantation in the Mpharane village, a part of the Alfred Nzo district in the Eastern Cape province of South Africa. Plantations in South Africa cover approximately 0,5 % of the total landmass and industrial use constitute 7,3 % of national GDP (2002) but some plantations also allow use of non-forest timber products (NTFP) such as berries, honey and firewood (Shackleton et al., 2007). Mpharane is administered by a headman and consists of different sub villages each one administered by a sub headman. The plantation falls under the administration of the headman of the sub-village Thotaneng. Concededly with the traditional rule, the village falls under the municipality of Matatiele and is influenced by the Ward Counsellor of Ward 13. Matatiele municipality has an estimated population

of 258,758 and Ward 13 has 2183 (Numbers from 2007) (Matatiele Local Municipality, 2012). The unemployment rate is 62.2 % of the economically active population and constitutes one of the biggest challenges for development in the municipality (Matatiele Local Municipality, 2012).

The village is positioned in a hilly landscape, with access to mountains and grazing areas surrounding it. In the mountains wattle, which is imported from Australia, spreads rapidly. The plantation is positioned on a slope and covers 0,67 km^2 (see figure 1). The area has a combination of native plants and imported species such as eucalyptus, wattle and pine imported because native species of South Africa are slow-growing and not suited for plantation use (Owen and van der Zel, 2000).

Figure 1: Aerial photo of the Plantation

Source: Google Earth

1.2 Access to forest benefits and livelihood implications

A household's availability of natural capital such as forest resources from a plantation is very much determined by the access rights and management of the resource. Access is defined by Ribot & Peluso as "*the ability to benefit from things*" (Ribot and Peluso, 2003, p. 153). Schlager and Ostrom define access as *"The right to enter a defined physical property"* (Schlager and Ostrom, 1992, p. 250). Ribot & Peluso stress the *ability* to benefit rather than the *right* because ability allows a more holistic view on access which incorporates the importance of power relations, besides merely the legal structures defining rights to property (Ribot and Peluso, 2003, p. 153). In this "to use a resource" means the enjoyment of a benefit of the resource, including legal as well as illegal access.

In this holistic view access is defined by and exercises through relations, positions and processes of power by different stakeholders. These processes include *access control, access maintenance* and *gaining access* to a particular resource and a full access analysis must include all three aspects in three steps: Identifying the flow of benefits, the mechanisms by which stakeholders are involved and the underlying power relations (Ribot and Peluso, 2003).. It is important to remember that these powers can be accumulated: *"One individual may hold a bundle of powers whose strands include various means of controlling and maintaining access."* (Ribot and Peluso, 2003, p. 159). During periods of socioeconomic change powers may be shifted and benefits can be redistributed.

Looking at forest resources from the perspective of providing benefits, Shackleton (2004) outlines a number of benefits which can be derived from forestry and can work to decrease poverty, table 1.

Table 1: Benefits derived from forestry with potential to decrease poverty

Benefits derived from forestry:

- Supply of subsistence goods: supply of basic needs, cash saving, safety net functions
- Small-scale trade in forest resources: incomes, reduced vulnerability
- Tourism enterprises employment, craft outlets, maintenance of culture and traditions
- Employment: wages, livelihood security, infrastructural development, training and capacity development
- Ecosystem goods and services: Such as water provision, nutrient cycling, carbon sequestration'

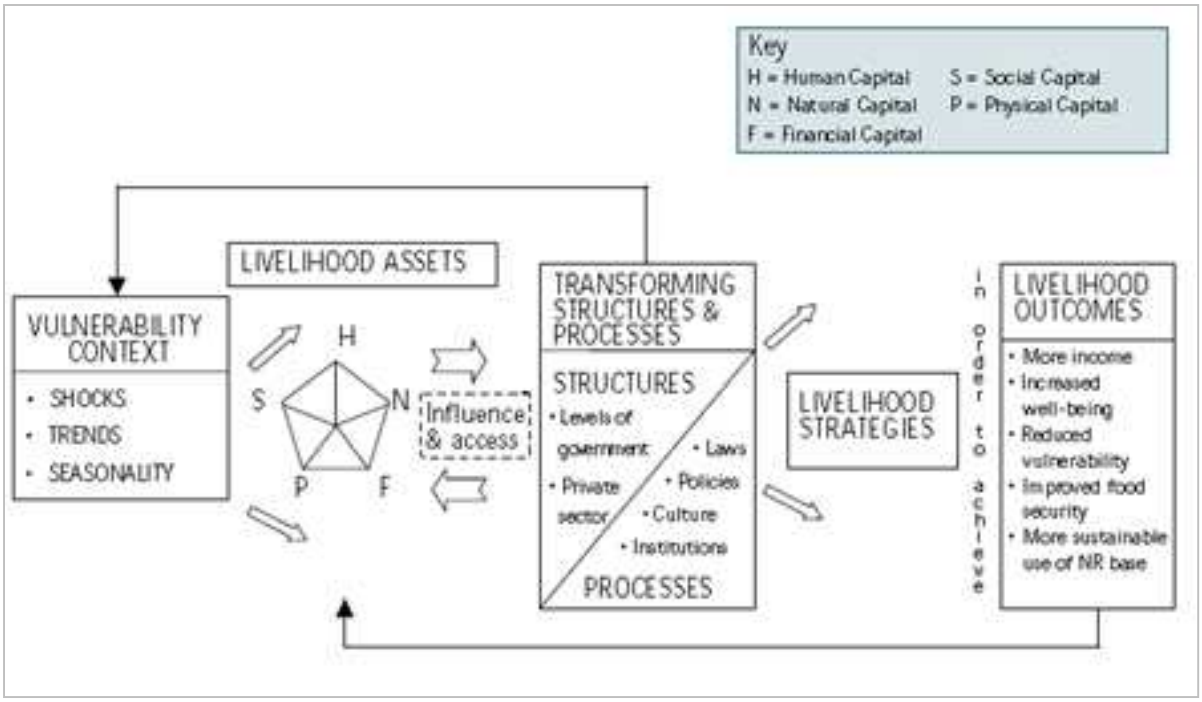
In addition to the direct benefits obtained, plantations can provide different indirect benefits including carbon capture, controlling water quality and cleaning of air, harvesting the sun, Preventing Erosion, Biodiversity Conservation, Soil Nutrient management, Cultural/traditional value, Recreation and Ecotourism, Biodiversity Buffer and Sustainability or future value.

Source: Shackleton (2004)

Benefits of forestry can reduce vulnerability and work as a safety net in times of stress especially to the poor people who are the most dependant on forest resources (Shackleton, 2004). Vulnerability and safety net are components of the Sustainable Livelihood framework (SL), which is a tool used to assess the different livelihood assets (or capitals) available to people, see figure 2 (DFID, 1999). For the purpose of our analysis of livelihoods in our site it is not essential to provide a detailed description of the (SL) framework and the different capitals (natural, financial, social, human, physical, see DFID, 1999 for further reference). Worth mentioning is that the SL framework is a

useful tool to look at livelihoods in a holistic way and including a broad scale of aspects such as vulnerability, assets, resources, policies, threats and the outcomes people aspire for (DFID, 1999). To poor households income diversification is an important strategy to decrease vulnerability by not relying heavily on one natural resource such as agriculture (Ellis and Allison, 2004). Forest resources include not only timber products such as poles and firewood but also non-timber forest products (NTFPs) (e.g. honey, berries, fruits etc.). These can also be important to people's livelihoods and can provide a safety net function (Paumgarten, 2005). In this way forestry can be seen as a diversification strategy to poor livelihoods, but its potential is defined by the access mechanisms available.

Figure 2: The Sustainable Livelihood framework



Source: DFID (1999)

The mechanisms of access include *rights-based access* which is the access defined by law, custom or convention and the *structural and relational access* mechanisms which include technology, capital market, labor, knowledge, authority, identities and social relations (Ribot and Peluso, 2003). Schlager and Ostrom (1992) provide a terminology which is useful to discuss the rights-based access mechanism of Ribot and Peluso, table 2.

Table 2: Terminology for access rights

Withdrawal*:* The right to obtain the "products" of a resource (e.g. catch fish, appropriate water, etc.) **Management***:* The right to regulate internal use patterns ad transform the resource by making improvements **Exclusion***:* The right to determine who will have an access right, and how that right may be transferred **Alienation***:* The right to sell or lease either or both of the above collective-choice rights

Source: Directly from Schlager and Ostrom (1992), p. 249-250

In a situation where there is no management system and the access is free the resource is referred to as a common pool resource (CPO). A CPO is a resource which is infinite meaning that the extracting of benefits by one person can potentially affect the other users negatively (Ostrom, 2002). Management practices face certain difficulties e.g. high costs to exclude user from extracting benefits in CPO's. Garrett Hardin article "The Tragedy of the Commons" outlines how common resources will be exhausted when individual use of benefits does not take the common future need for benefits into consideration because of a lack of management (Hardin, 1968).

1.3 Problem statement

To address the access and derived benefits in our case area, the plantation in Mpharane, we have defined the following problem statement:

What are the access mechanisms to the plantation in Mpharane, and how do they affect people's current and future livelihoods and opportunities for further benefits?

1.4 Research questions and hypotheses

Our problem statement has generated five interconnected research questions:

- *Which resources and benefits are available to the villagers in the plantation?*
- *What are the mechanisms for access and management to the plantation?*
- *Who benefits from the plantation resources?*
- *Which impact does the use of the plantation resources have on the user's livelihood?*
- *What are the opportunities and constraints for future benefits of the Plantation resources?*

Based on our theoretical framework the following hypotheses were made for the research:

- The poorer the household, the greater the dependency on the plantation (Shackleton, 2004)
- The shorter the distance to the plantation the greater the dependency on the plantation: We know that there is alternative wood resources available in the mountain areas and thus expect that people will collect their wood in whichever place is nearest.
- Local levels of crime will affect the use of the plantation: In the very beginning of the research it was discovered that the plantation use seemed constrained by high rates of crime inside.

2. Methodology

To answer our research questions we have applied a combination of social science methods such as interviews, questionnaires, Participatory Rural Appraisals (PRA's) and natural science methods in the forest resource assessment. The methods were constantly tested and modified in close collaboration with our translator to build from our synopsis (Appendix IX) and adapt to the increasing knowledge about the site and the context in the field. The PRA methods, originally proposed by Chambers in the 1970's (Parnwell, 2006), engage the actors themselves, aiming to uncover underlining power structures and mechanisms behind everyday life.

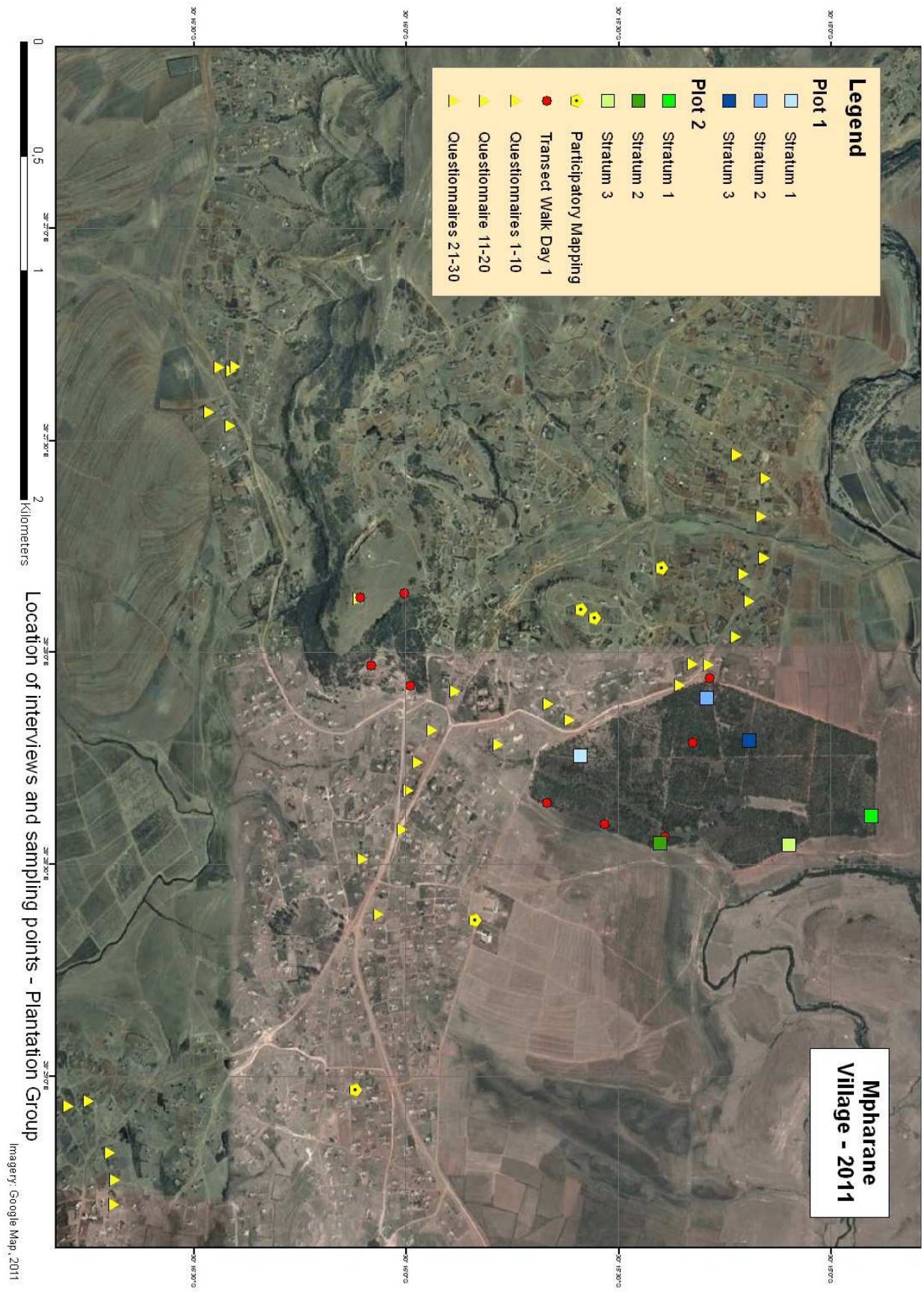
To ensure the validity of the collected data, we have applied triangulation whenever possible, including secondary sources of literature containing theoretical frameworks and case studies (Jick, 1979). For example, plantation use and access has been addressed through questionnaires, mapping and interviews with the users as well as interviews with the decision makers. These methods provide a combination of qualitative data and quantitative data. In the appendix I the original questionnaire data and meaning summaries of the interviews can be found. All relevant places of interest, locations of interviews and sampling have been GPS marked for later analysis (see figure 3, Appendix VIII). An overview of the field methods is presented in table 2.

Table 2: Overview of applied field methods

Field Method	Purpose	Sampling	Quantity
Conversation with translator	To gain an in depth perspective on the village life and the plantation use	Ongoing	Unlimited
Transect walk	To and get an overview of the resources of the plantation	Guided by translator	1
Wealth indicators (PRA)	Create identifiable indicators of 3 different economic groups in the village (poor, average, rich)	Participants: 5 translators and chalet cook	1
General observations	Deepen the understanding of the village life and use of the plantation	Ongoing	Unlimited
Participatory mapping of wood resource use	Explore where people go on an everyday basis to collect wood resources	Identified by translators: 2 samples close to the plantation, 1 sample further away	3
Semi-structured interviews with	Explore specific knowledge about plantation access,	Attending community	Ward counsellor,

key informants	management and use	meeting, guidance from translator and identification through questionnaires	bee-keeper, sangoma, headman, community police, sub-headman, carpenter, elder plantation user (8)
Questionnaires and wealth indicator observations	To gain quantitative data about the plantation use	20 samples close to the plantation, 10 samples at further distance	30
Follow-up interviews (on questionnaires), including livelihood ranking exercise	Further explore peoples use of plantation resources and understand the importance of the plantation in their livelihood	Identifying interesting people from questionnaires based on their use of the plantation and their wealth	5
Forest resource assessment	To understand resources available and assess the possible future use	Tree stratas identified from air photo	6 plots (20mx20m) in 3 stratas
Future scenario workshop (PRA)	To get ideas about future wishes and expectations towards the plantation	Identifying interesting and talkative people from previous activities	One, with four participants

Figure 3: Places of interest, locations of interviews and sampling



2.1 Social science methods

2.1.1 Transect walk, conversations and general observations

Observations together with our translator have served as an important source of information (Mikkelsen, 2005). The first day a transect walk through the plantation gave us an overall impression of the size, density, variety of species (local names) and patterns of village use. We also gained a good impression about the general living standards of the community, further enforced by translator inputs.

2.*1.2. Wealth ranking*

Together with the translators of the other groups and the chalet cook, a wealth indicator exercises was conducted. This PRA served the purpose to provide indicators that could be used to categorize households into poor, average or rich (Mikkelsen, 2005). One of the other groups facilitated and participants discussed and assessed which things they would expect to find in the households of each of the wealth categories. They had to all agree at the end of the discussion, see table 3.

Table 3. The wealth indicators identified in the PRA

Rich	Average	Poor
Solar generator, generator, cow, tractor, farming: home gardens and outfields, cell phone, fridge, livestock, cows, sheep, horses, high fence, radio, tv, roof with heavy tiles	Solar panels, gas, tv, most have gardens with fields, cell phone, fridge, horses, donkeys, goats, chickens, sheep, cows, fences from poles and wire, radio, houses made from blocks, corrugated iron roof	No tap inside, wood and paraffin for cooking, candles, pigs, chickens, cats, goats, no fence, radio, mud house, thatched roof

Source: PRA, wealth ranking

2.1.3 Participatory mapping

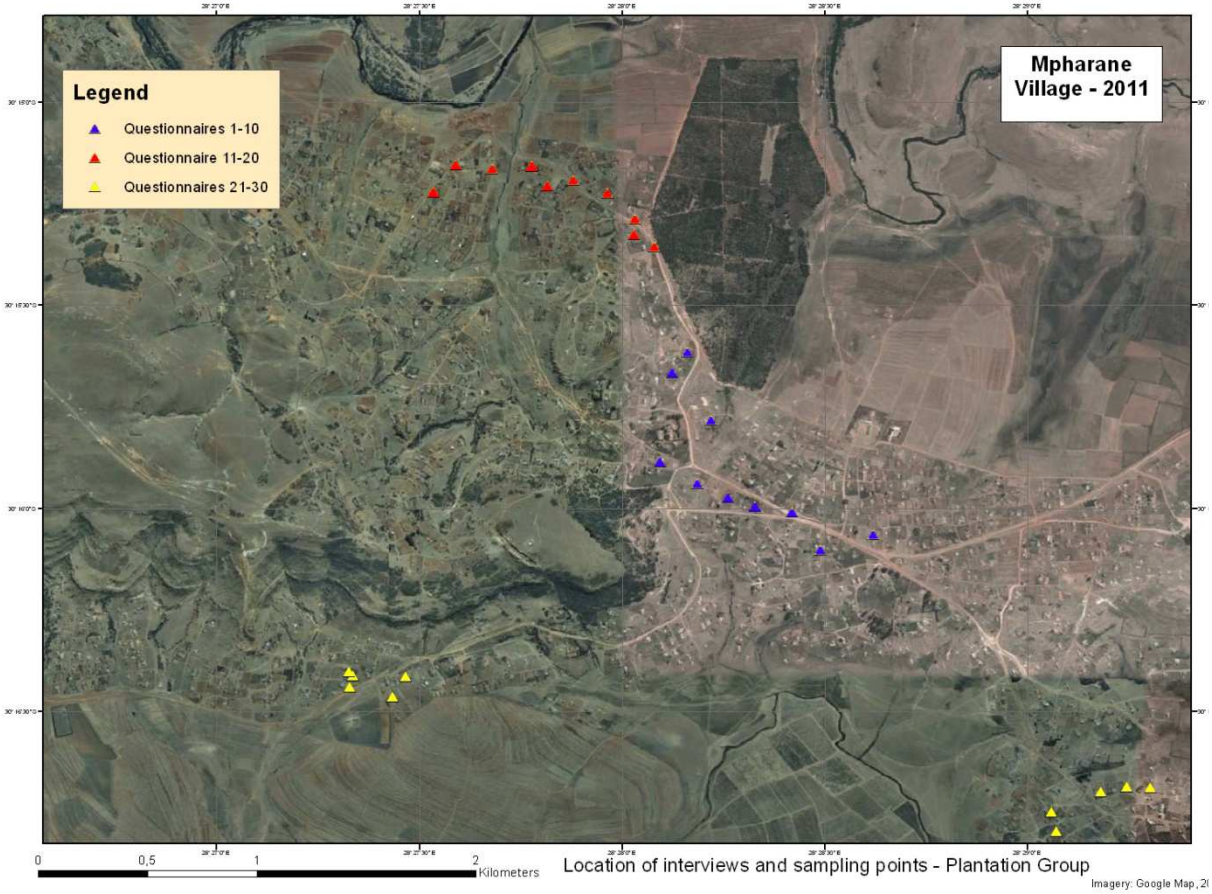
The participatory mapping exercises were conducted three times in the beginning of the fieldwork to understand where users collect their wood resources from without emphasizing on the plantation from our side. Distance from the plantation was used to identify households. Everyday journeys and use of forest products was elicited from the participants.

2.1.4 Questionnaires and wealth indicator observations

The main purpose of the questionnaire was to gain quantitative data about the use of the plantation (GAO, 1993). It was conducted after a few days of fieldwork and thus we

could adapt our questions to new knowledge gained through the participatory aping exercises and key-informant interviews. Our sampling strategy was systemized random sampling based on the hypotheses that distance has an influence on the use of the plantation, figure 4.

Figure 4: Locations of questionnaires



Source: Google Earth with GPS points

20 samples were conducted by following the main road from the plantation in two different directions (10 in each direction) and selecting every third household, counting on both sides of the road. In case a house was empty we selected house number two, but we always continued counting from number three. Houses that were further than 100 m away from the road were not selected and houses could not be behind another house in a line from the road. We used the first 3 households to modify and finalize the questionnaire. The last 10 samples were conducted at a greater distance from the plantation in two different sub-villages: Dikamoreng, west of the plantation was 2,68 kilometers from the plantation edge (road distance) and Motlokofane, east of the plantation was 2,69 kilometers away. These were chosen because they had the greatest

distance we could get from the plantation within Mpharane. The questionnaire took 15-20 minutes and while it took place, observations were used to tick off the identified wealth indicators, to categorize the household into poor, average or rich. Each household was mapped with GPS to mark the distance to the plantation.

2.1.5 Key informant interviews

Eight key informant interviews were conducted and were very beneficial in deepening and triangulating our data (Jick, 1979). An overview of the interviews and a meaning summary of each is found in Appendix I.

2.1.6 Follow-up interviews and livelihood ranking

After the 30 questionnaires were conducted, households of special importance were selected. The selection criteria were their wealth group, distance to plantation and their patterns of use of the plantation. The follow-up questions were based on a preliminary analysis of the questionnaire data and served to elaborate on issues found. Additionally a livelihood-ranking exercise was conducted with each of the five households to serve as examples of the importance of the plantation to peoples livelihoods. Before the interviews, the key sources of income in the village were settled together with our translator, table 4.

Table 4: Subsistence and income generating activities in Mpharane

Brainstorm of livelihoods in Mpharane:
Remittances, livestock, crops (outfield), jobs, hired by someone else, pensions (government or company), private business, sculptures selling, firewood, forest products from the plantation, forest products from outside the plantation, repairing cell phones, building/construction work, teacher, nursery, government job, permanent job, collect and sell, fruits, home garden, public service jobs, social grant.
These were combined into 11 categories:
Money from relatives, livestock, jobs – hired by someone, private business, pension, forest products from outside the plantation, forest products from inside the plantation, home garden, outfields, social grant, collection/hunting

Source: Moshweshwe, our translator

Each of them was written on a card and during the exercise the participants were asked to rank each of them according to importance for their entire household. The participant could remove irrelevant cards and add additional ones if needed, but nobody chose to do so.

2.1.7 Future scenario workshop

The final activity of the fieldwork was a workshop which covered the wishes and expectations from the villagers of the future use of the plantation (Mikkelsen, 2005). The participants were selected from earlier activities on criteria such as patterns of use, interest in the plantation and their openness to discuss. Four people participated and the workshop took two hours. The participants were asked to discuss the current management and opportunities for future scenarios. They were not asked to agree in the end. The discussion was facilitated by a group member.

2.2 Natural science methods

2.2.1 Forest Resource Assessment

A forest resource assessment was undertaken to assess and identify the plant species diversity, species composition of different parts of the plantation; level of cutting and natural regeneration of plants; the management practices; most cut species and to estimate the diameter, height, basal area and volume of individual samples trees and the whole plantation. First we looked at the aerial satellite photos and identified specific areas of interest in which the following sampling was undertaken. Stratified random sampling technique was used as a sampling method to get representative samples of the plantation since the plantation stand is not homogenous as it is shown in the aerial satellite photo (Freese, 1976). Three strata which have respectively scattered, average and dense plant stands were selected based on homogeneity observation of aerial satellite photo all over the plantation in which two plots of 20 meter times 20 meter have been taken from each stratum (see Appendix II). Name of the species within the given plot have been recorded and photos of species which are not know were also taken for further identification. Furthermore, the number of each major species within the sample plot was counted. In addition, Measurements of the following parameters were taken: diameter, height, basal area and volume according to Husch et al, 2003, see appendix VII.

Soil testing

Field observations were carried out to describe soil color, using a Munsell chart and textural analysis was undertaken. In addition, PH was measured in the laboratory using standard methods.

3. Results

The first three results sections describe the local setting of natural resource availability, livelihood security and governance. The remaining results sections present our specific findings in relation of the plantation. This begins with the historical and current access mechanisms, direct, indirect and alternative uses, ending with perceptions and future wishes and expectations.

3.1 Forest Resources Overview

The plantation, with a total area of 0,67 km^2, excluding the not covered parts in the middle (see Appendix II), includes different plant species such as Eucalyptus (white and dark), Wattle, blackberry, conifers, Monnamotsko (*Diospyros villosa*), peach trees, impepho (herb which is used to expel dwarfs, called Hokolosi, and evil spirits), Paplier tree (*Spirostachys africana*) and bushes, which are named in the Sotho language as Bobojane (with eatable fruits), Thobasele, Poneyo Jtshwene, Lebelebele and Catsione. Additionally there are lots of other unidentified herbs and bushes (see Appendix VIII).

To find out, which amount of species is in the plantation, the forest resource assessment was implemented. As we can see from table 5, eucalyptus (blue gum) is found throughout the plantation and is the largest tree species. The other species are unevenly distributed: Wattle is most abundant in the average strata, and paplier in the dense strata. The cutting patterns show that wattle is the most used species, followed by eucalyptus and paplier. Our observations show that many of the cut trees were continuing to grow and had been cut when they were small in diameter. There appears to be more cutting in the scattered and average stratum than in the dense strata. The trees in the dense strata also seem to be greater in diameter.

Table 5: Forest resource assessment

	Stem count	**Cut trees (in %)**	**Diameter (in cm)**	**Basal area (cm^{2-m})**	**Volume (in m^3)**
<u>Eucalyptus</u>					
Scattered, plot 1	40	68	309.5	7.4	1.3
Scattered, plot 2	21	31	306.2	12.3	2.2
Total scattered stratum	11438				656
Average, plot 1	28	50	222.5	4.5	0.6
Average, plot 2	52	54	391.9	7.2	1.0

Total average stratum	37000				740
Dense, plot 1	55	13	709.5	21.4	3.4
Dense, plot 2	32	28	615.9	32.3	6.9
Total dense stratum	16313				1931
Plantation total	64751				3327
Paplier					
Dense, plot 2	9	44	10.4	2.8	0.4
Wattle					
Scattered, plot 2	2	50	4.5	0.1	0.07
Average, plot 1	19	84	6.8	2.0	0.16

Other understories species were found in the different plots. In Table 6 the total steam number in the six plots are shown, as well as the percentage rate of cut species. The use of these species is playing a minor role.

Table 6: Other Species and the cut percentage

	Monnomotsko	**Lebelebele**	**Catisone**	**Blackberry**	**Bobojane**
Total stem no.	3	11	102	10	14
% Cut	33	9	2	0	7

According to the information from our follow-up interviews, most people prefer eucalyptus (blue gam) and wattle. According to the collected information from questionnaire and interviews, people mostly collect resources along the road on the western side of the plantation

Besides the tree measurement, other things were observed. There is a high degree of erosion in the plantation influenced by the topography. This includes gully erosion, where plants are exposed for uprooting and damaged, (see figure 4).

Figure 4: Gully erosion within the plantation

Source: Own picture

One of the agro forestry practices undertaken within the plantation is bee keeping. 16 hives are in use in a bee keeping project in which the plantation provides feeding sources and shelter for the bees. This project, including the honey and wax production, is handled in a traditionally way. Damage by insects (wax moth) is mentioned as one of the problems of this bee keeping project.

3.2 Livelihoods and Wealth in Mpharane

Assessing the livelihood of the population in Mpharane was a secondary research question thus a detailed quantitative analysis was not conducted in the fieldwork. The purpose was to set the context for our research on the importance of the plantation. This section provides a brief overview of the general livelihoods in Mpharane with consideration of Ellis' (2000) framework for livelihood analysis. It is based on information from wealth indicator field observations, livelihood ranking exercises in our interviews, and general observations and enquiries into village infrastructure and facilities. The result of our livelihood ranking exercise performed in our five follow-up interviews is seen in table 7.

Table 7: Livelihood Ranking

Ranking	PPM3	Q1	Q7	Q8	Q13
1	Social grant	Private business	Money from husband	Pension	Social grant
2	Livestock	FR plantation	Social grant	Social grant	Homegarden
3	Homegarden	Jobs – hired by someone	Homegarden	Homegarden	FR plantation
4	Job – hired by someone	FR outside	Job – hired by someone	Money from relatives	
5	FR Plantation	Homegarden	FR outside the plantation	Private business	
6	Private business	Socialgrant	FR Plantation	FR outside	
7	Money from relatives		Livestock		
8	FR outside				
9	Pension				

Source: Livelihood Ranking Exercise

Financial capital: A tendency we see in the table is a preference on monetary incomes opposed to subsistence production: *"I cannot survive without my pension and social grant, they are most reliable"* (Q8). Respondents indicated that they would depend on subsistence agricultural production from their home garden in the event of removal of regular remittances. The unemployment rate is very high in the municipality of Matatiele, 62.2 % of the economically active population (Matatiele Local Municipality, 2012). The opportunities of the respondents to make money on private business were mostly insignificant, excluding Q1 who lives from selling firewood. Temporary

employment, such as working on the road, was an option for three respondents. Q7 received remittances from her husband in Durban. The range of wealth indicators identified, implies large diversity of incomes within Mpharane.

Human capital: Although schooling is provided until 18 years of age, literacy is 6,39 % in the municipality (Matatiele Local Municipality, 2012).. Through residing in local households and attending the community meeting we observed some social barriers to attendance such as a need to take responsibility for younger siblings, or even teenage pregnancy. There also seem to be financial barriers to higher education and only 0,39 % of the municipality hold a bachelor degree (Matatiele Local Municipality, 2012). We interviewed one traditional healer who wanted to become a doctor his whole life but was unable to. Regarding health, there is a free clinic in the village with a nurse but no doctor. The villagers have to pay for their own medicines.

Social Capital: The interviewed beekeeper received training in East London with assistance by the agricultural office in Maluti, indicating networks of assistance are operating in the area capable of providing small-scale benefits. There were other small initiatives such as an agricultural project. Regular community meetings allow attendance for all and the opportunity to suggest changes: "*If the plantation was fenced I would organize the community and go to the headman to negotiate permission*." (PPM1). Speaking to the cook in the chalet we perceived a culture of helping those in need.

Physical Capital: In Mpharane there is no electricity and many houses still have water taps outside their houses. For cooking only the wealthiest have access to gas while most cook using firewood or paraffin (questionnaires). The poor households mainly live in mudhouses with thatched roof, the average households have brick houses with corrugated, the most wealthy have tiled roof. There is no sanitation or sewer, but every household has a pit latrine due to a government project, which reduces susceptibility to diseases. Mpharane is a few hours' drive on dirt road from Matatiele and there is a daily bus running.

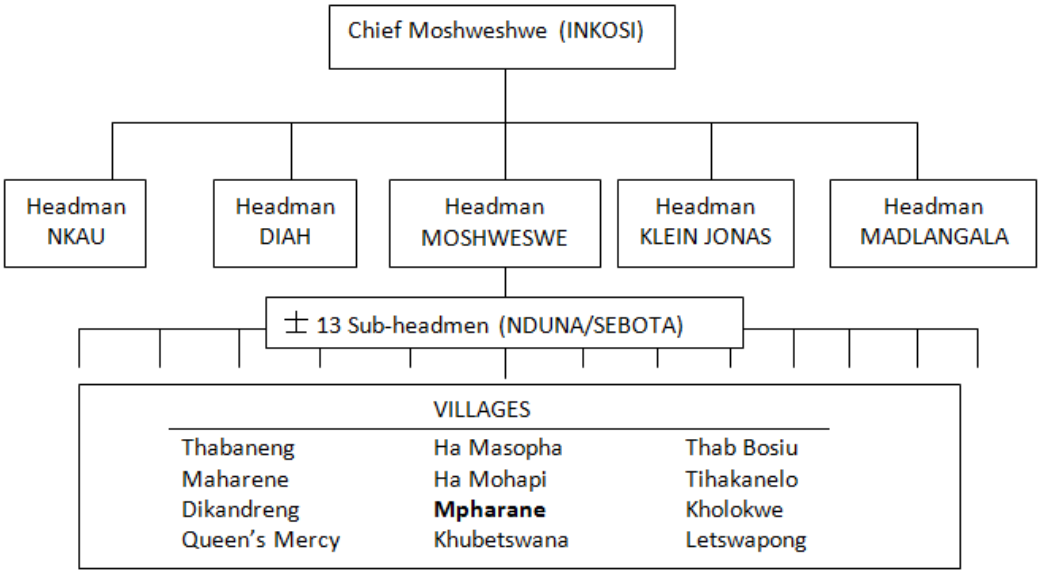
Natural Capital: Mpharane is situated in a rural area surrounded by outfields, grazing land, a river and a mountain range. The plantation is the biggest forest resource in the region. During the ranking exercise we asked what the participants would do in absence of natural resources from the plantation. Q7 answered: *"Without it, I won't get firewood*

and poles, I will suffer because I will go to town to buy them. I won't have enough money because firewood is expensive." This illustrates a dependency on the natural resources in the livelihood of the household. PPM3 has a monthly social grant income, but sometimes sells firewood, whenever she doesn't have money for candles. This indicates she is using this natural resource for income diversification, of particular importance to the poor as mentioned in the introduction.

3.3 Governance Systems and Conflict Resolution in Mpharane

Mpharane is governed under two parallel systems, those of the traditional authorities (figure 5) and the elected political system (figure 6). These correspond to the area's historical divisions, both as part of the Bantustan, or homeland area of Transkei (Appendix III) and under the municipality of Matatiele. The jurisdiction of Chief Moshesh corresponds to an area covering four wards, divided into villages (listed in figure x) then subvillages. Each ward within Matatiele has one councillor; Mpharane is situated in Ward 13 (Appendix III), which includes 10 villages.

Figure 5: Traditional System



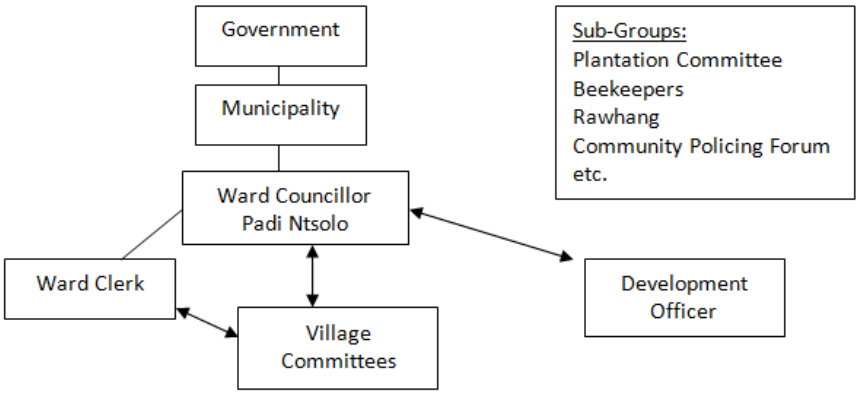
Source: TBT

The position of chief is hereditary and advised by a hierarchical structure of headmen and sub-headmen. The community is able to influence decision making through weekly meetings, which act as a local court, and additional meetings as required. During the

weekly meeting we observed the appointment of a new sub-headman, chosen by the community then ratified by the headman. The responsibilities of the chief are maintaining law and order, resolving local disputes and assigning land. *"The chief is looking after our own cultures. He must protect the cultures of the area."*-Ward councillor.

There are also various sub-groups operating within the area (figure 6). All our key informants agreed that the chief has final authority over decisions and that he must be consulted first in the process of change.

Figure 6: Political System



Source: Key-informant Interviews

Elections are held for the position of the Ward Councillor every five years, currently Padi Ntsolo. The ward clerk provides administrative support. Within Ward 13 there are 10 villages, each with a committee. Downward accountability is secured through a local municipality forum every month. The councillor is upwardly accountable to the municipality through the Integrated Development Plan (IDP). Each ward has a community development officer whom monitors the councillor's progress in achieving the priorities for the ward, which are outlined in the IDP. The priorities for Ward 13 are listed in Appendix IV and include the Thotaneng Plantation Rehabilitation Programme. When interviewed, the Councillor described his responsibilities as "increasing employment and bringing in public work projects, for example agricultural, fire fighting and maintenance projects" and obligations towards the municipality as "to design programs and call for community meetings". He stressed the importance of maintaining a good relationship with the chief and highlighted a collaboration problem between rural and urban governmental institutions.

Local conflicts continue to be resolved through the traditional process, however more serious crimes are dealt with at the police station in Matatiele. During the local court meeting a decision to take an offender was questioned :"The law was the most powerful than everything, so he had to be punished according to the law." The ward councillor confirmed the requirement to get approval for all his decisions from the chief. "Sometimes there are challenges, but we do talk together." In his own opinion, the greatest resistance to the Ward councillor are due to fears of him using his powers for personal gain. Such fears were indeed shown by one informant.

3.4 Past and Current Access and Management of the Plantation

Using data from our interviews and questionnaire data we have created table 8, which gives an overview of past and current decision making, access, management and security in the plantation. This is subsequently discussed according to Ribot and Peluso's (2003) framework for "bundles of powers" controlling and maintaining access.

Table 8: Past and current decision making, access, security and management of the plantation

	Past	Current
Decision making	- "It belonged to the government but the king/chief still had to give permission" (Q13)	-The ward counsellor tries to influence the future projects, but the chief has the power to make decisions for the plantation -People can suggest changes in community meetings -Plantation committee
Access	-People would make a request with the headman and pay to get a permission letter. -People were submit to punishments if they accessed without permission.	- "*Everyone can go there.*" (Ward counsellor interview) - 25 out of 30 questionnaire respondents said it is free to access the plantation
Security	-There were rangers ensuring security in the plantation and you would have to pay to access. -The plantation was fenced	-People do not feel safe using the plantation -There is no security system -No fence around the plantation
Management	-The plantation was managed by the rangers living inside the plantation. One source estimated that 3 people lived and worked inside the plantation and a number of people worked there	-No management system

	part time (Q13)	

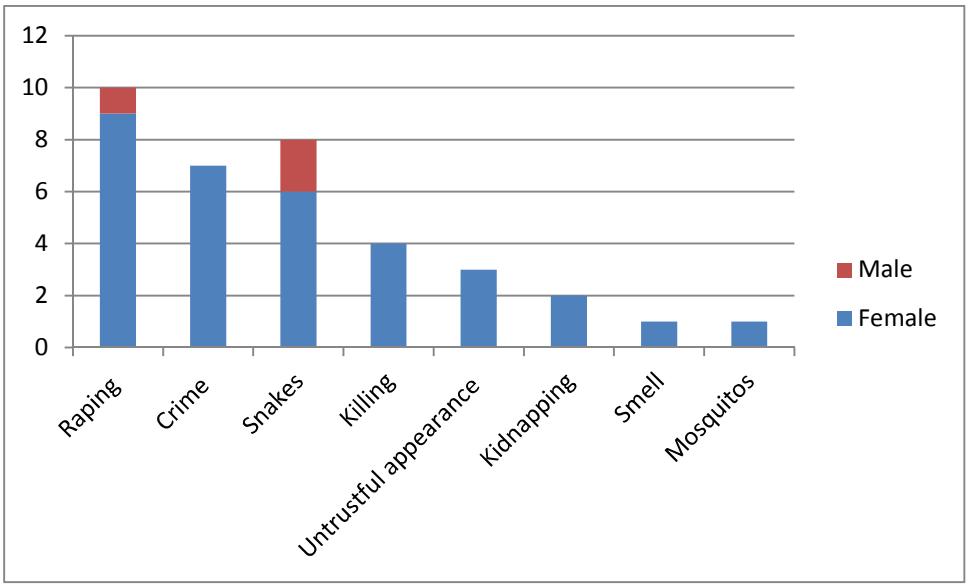
Sources: Semi-structured Interviews and Questionnaire Data

From table 8 it is clear that a change has occurred in the plantation. When exactly this change occurred was not clear to the people we interviewed. The ward counsellor referred to the difficulties of having an official management system which requires bookkeeping and the making of annual reports as a factor of change. According to the headman the abolishment of the Apartheid in 1994 meant that national government structures were removed from the plantation area and people started to cut down the fence surrounding the plantation.

The beekeeper in the planatation have fenced a small area and restricted the access. This area was temporarily made available to them by the chief, but the project is planned to move to a location outside the plantation by the river within a few years (Beekeeper interview). The beekeepers have a constitution which does not allow anybody to join but it is subjected to amendments, which are agreed upon in the whole group during a revision meeting every third year.

We also asked the villagers about their perception of the past and current access and management in the plantation. Out of 30 questionnaires, 5 respondents said that they had to ask for permission to use the plantation. The general understanding is that in the past access required a permission and payment, but this is currently no longer required. However, this was not completely unanimous. We interviewed a carpenter who said that he still needs permission from the sub-headman to access the plantation, but does not pay for collecting the resources. All respondents said that the management in the past was better than the current: *"The past management was best because you could walk freely inside the plantation without being afraid of criminals."*(Q8). The reasons to fear the plantation were many and are visualized in figure 7. Especially the women fear raping and a few of our respondents had heard of specific incidents. Snakes were also a frequent problem.

Figure 7. Reasons of fear of the plantation



Source: Questionnaires

Currently there is no security guard for the plantation and there are no paid police officers in the village to enforce the law. Crime management has since 1996 fallen under the municipality and the South Africa Police Service Act has introduced Community Policing forums in Mpharane (Matatiele Local Municipality, 2012). 71,9 percent of the questionnaire respondents said that they do not feel safe to use the plantation, especially the women (table 9).

Table 9: Perceptions on safety inside the plantation

	Feeling safe in Plantation				
	Safe		**Not Safe**		**Total**
	n	%	n	%	n
Male	6	66,7	3	33,3	9
Female	3	13,0	20	87,0	23
Total	9	28,1	23	71,9	32*

Source: Questionnaires *two households with F+M as interviewee

In an interview with the head of the Community policing forum we learned that crimes happen every month in the plantation and weekly in the rest of the village. Initiatives to try to enforce the law in the village are obstructed because people have weapons and do not respect the law: *"...people know they are not going to be punished very harshly."* (Community policing forum interview). According to the IDP of Matatiele Municipality 2011/2012, crimes have the potential to impact negatively on the local economic development in the municipality.

3.5 Direct Benefits of the Plantation

Using the data of the 30 questionnaires, the following results regarding the patterns of using the plantation were calculated: In total, 83,3 percent of the interviewed households use the plantation. Classified into the three wealth categories (based on the observed wealth indicators, Appendix I), 85,7 percent of the poor, 83,3 percent of the average and 80,0 percent of the wealthy households use the plantation. The most important resource out of the plantation is firewood, which is collected by 76,7 percent of the total respondents. Out of the plantation users, 92,2 percent of the households collect firewood. Poles for fencing and roofing are each collected by 53,3 percent of the total respondents. Collections of berries or fruits (20,0 percent of the total respondents), medical plants and others (23,3 percent each) play a minor role (in Table 10), but still medical plants have traditional value in Mpharane and are used by traditional healers called sangomas. Trees are only used by sangomas for firewood in ceremonies and not for making medicine (Sangoma interview). We did not find evidence from our interviews that there is any locally perceived traditional or spiritual value of trees in the plantation. The practical use for people's livelihoods is viewed as the important factor. However, we did find evidence of the traditional value of firewood for ceremonies, eating traditional food and using medicines (Sangoma interview).

Table 10: Use of the plantation

	Household Wealth Status							
	Poor		Average		Wealthy		In Total	
Use of the plantation	n	%	n	%	n	%	n	%
Use in general	6	85,7	15	83,3	4	80,0	25	83,3
Non-use	1	14,3	3	16,7	1	20,0	5	16,7
Total	7	100,0	18	100,0	5	100,0	30	100,0
Firewood	6	85,7 (100,0)	13	72,2 (86,7)	4	80,0 (100,0)	23	76,7 (92,2)*
Fencing Poles	5	71,4 (83,3)	10	55,6 (66,7)	1	20,0 (25,0)	16	53,3 (64,4)*
Roofing Poles	3	42,9 (50,0)	11	61,1 (73,3)	2	40,0 (50,0)	16	53,3 (64,4)*
Berries/Fruits	1	14,3 (16,7)	4	22,2 (26,7)	1	20,0 (25,0)	6	20,0 (24,0)*
Medical Plants	1	14,3 (16,7)	5	27,8 (33,3)	1	20,0 (25,0)	7	23,3 (28,0)*
Others	1	14,3 (16,7)	6	33,3 (40,0)	0	0,0 (0,0)	7	23,3 (28,0)*

Source: Questionnaires ** Share of all interviewees (Share of plantation users only)*

Out of all our interviews and questionnaires only two respondents sell the collected plantation resources (Q1 and PPM3). Q1 sells firewood and roofing and fencing poles, PPM3 occasionally sells firewood. One additional person sells medical plants (Q21). The rest of the collection is for subsistence only. The honeyproduction from the beehive is 25 liters of honey per hive per year which has a value of approximately 600-650 Rand when selling the honey and wax products in the community (Beekeeper interview).

Besides of identifying who and how many users the plantation has, it is, in order to compare, important to calculate how much the users collect. Since firewood is the most used resource out of the plantation we calculate these. To find comparable results, a scale with the average purchasing price for each type of firewood collection was created, using information from questionnaires and interviews, for calculations see appendix V. The results are seen in table 11.

Table 11: Value of Firewood collection (per Person and year)

	Poor	Average	Wealthy	Average (All)
Value (in Rand)	415,9	406,2	647,0	435,2

3.5.1 Impact of distance to the plantation

The general use of the plantation is almost equal for questionnaires close and far from the plantation (85,0 percent users of nearby households, 80,0 percent users of the away households), but there are differences: Nearby households collect 85,0 percent firewood in the plantation, the far away only 60,0 percent. Households at greater distance collect more roofing poles but the use of poles for fencing is almost equal. (See table 12).

Table 12: Impact of distance to the plantation

	Distance			
	Nearby		Away	
Use of the plantation	n	%	n	%
Use in general	17	85,0	8	80,0
Non-use	3	15,0	2	20,0
Total	20	100,0	10	100,0
Firewood	17	85,0 (100,0)*	6	60,0 (75,0)
Fencing Poles	11	55,0 (64,7)	5	50,0 (62,5)
Roofing Poles	9	45,0 (53,0)	7	70,0 (87,5)
Berries/Fruits	5	25,0 (29,4)	1	10,0 (14,3)
Medical Plants	3	15,0 (17,6)	4	40,0 (57,1)
Others	3	15,0 (17,6)	4	40,0 (57,1)

Source: Questionnaires ** Share of all interviewees (Share of plantation users only)*

3.6 Indirect Benefits of the Plantation

As a secondary outcome of our assessment of the direct use of the plantation we discovered some indirect benefits, which the respondents had knowledge about and some observations we made ourselves.

- **Ecosystem services:** Plants provide oxygen to the environment which helps in cleaning the air and respiration of animals including human beings. We have

come across respondent who has mentioned the advantage of plantation as a source of oxygen (Q. 29) in which this indicates the awareness of the people about the ecosystem services. Black wattles, multipurpose highland legume tree, are an efficient nitrogen-fixer and good source of green manure and can give annual yields up to 250 kg/ha of fixed nitrogen (Little, 1981).

- **Preventing erosion:** Erosion problem has its own influence on the productivity and sustainability of the plantation. However, the plantation has still a significant role in reducing erosion."*Many red coloured tropical soils have clay particles composed mainly of kaolinite and oxides of iron and aluminium."* Soils that are rich in clay content are relatively less prone to erosion because of their cohesive property (Foth, 1990; pp 26). Therefore, the plantation soil is relatively less prone to erosion.
- **Biodiversity conservation:** Bee keeping is undertaken in which honeybees uses as pollinating agents (Cayuela et al, 2011). In addition, ants could act as biotic defenses (Janzen (1966) as cited in (Rosumek et al, 2009; pp 537)), protecting plants against herbivores and parasites. Therefore, since different types of ants are found within the plantation, different plants are benefited in this aspect and vice versa.
- **Cultural value:** using the plantation as a source of herb which uses for expelling evil spirits and as a place of grave are some of the traditional values to the society.
- **Biodiversity buffer:** Buffer zones are the real interface between human and conservation activities (Hall & Rodgers, 1992). Therefore, by reducing firewood demand, the plantation has an indirect function in protecting traditional medicines in the mountains.

3.7 Alternative to Plantation Products

Through our participatory mapping exercises we assessed that there are two alternatives for wood resources to the plantation: the resources in the mountains and the resources which can be bought in town (see Append VI). These were included in our research to give an indication of the relevance of the plantation specifically.

3.7.1 Collection from mountains

The mountains around Mpharane contain a high share of wattle, which is mainly used for firewood. As a consequence, this area is only marginally used for poles for roofing and fencing, berries or fruits. Besides collecting firewood, which is done by 86,7 percent (26) of the interviewed households, medical plants are collected by 40,0 percent of the households. The same medical plants are found both in the plantation and the mountain, but their quantity is larger in the mountain and therefore it is preferred (Sangoma

interview). Table 13 shows that all the households who are not collecting firewood in the plantation use the mountain as an alternative and also 82,6 percent of the people collecting firewood in the plantation also use the mountains for firewood collection.

Table 13: Share of plantation and mountain use

	Plantation-Firewood users		**Non Plantation-Firewood users**	
	n	%	n	%
Collecting Firewood from Mountains	19	82,6	7	100,0
Not Collecting Firewood from the Mountains	4	17,4	0	0,0
Total	23	100,0	7	100,0

Source: Questionnaires

3.7.2 Buying forest products

The second alternative, is buying forest products in Mpharane by private sellers or in a nearby town, such as Matatiele. 80,0 percent of the interviewed households indicated that they buy forest products and the purchase of forest products can be identified in all wealth groups, not only in the wealthier households (table 14).

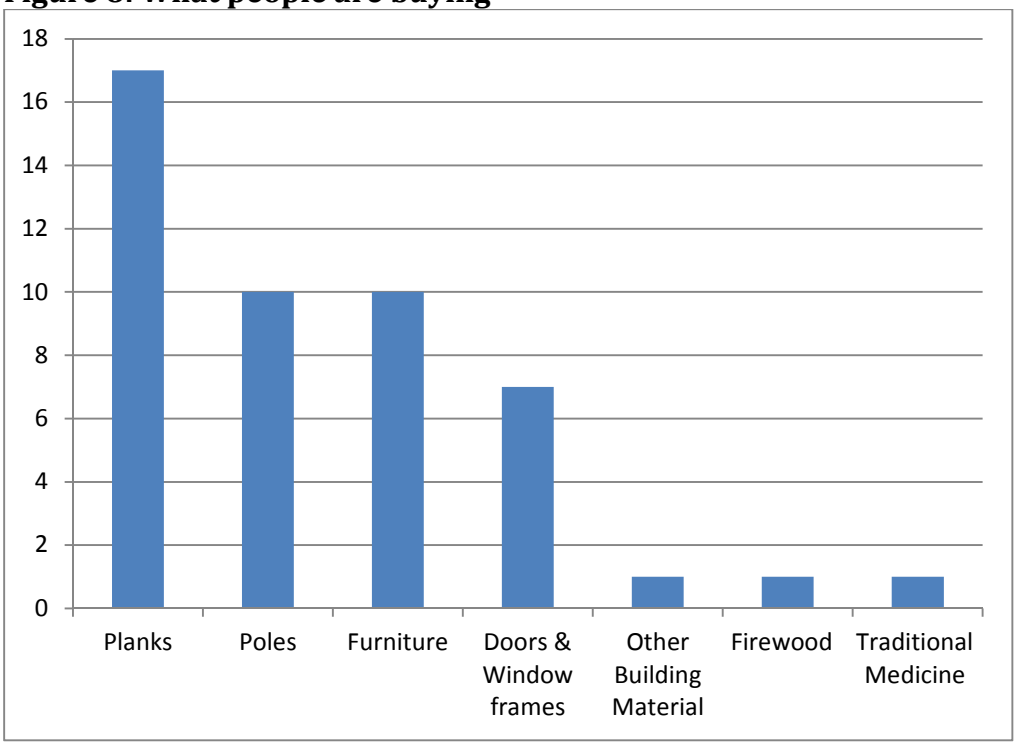
Table 14: Purchase of forest products

	Yes			**No**		
	n	%		n	%	
Forest products buying people	24	80,0		6	20,0	
Wealth Ranks	**P**	**A**	**W**	**P**	**A**	**W**
n	6	14	4	1	4	1
%	25,0	58,3	16,7	16,7	66,6	16,7

Source: Questionnaires

Most bought forest resources are planks, which are purchased by 56,7 percent of the households, firewood is only bought by one interviewed household (see figure 8).

Figure 8: What people are buying



Source: Questionnaires

3.8 Perception, future Wishes and Expectations regarding the Plantation

Having established the past and current management of the plantation we looked at the opportunities for the future of the plantation, by ollecting opinions and perceptions in semi-structured interviews, key-informant interviews and in our future scenario workshop. There were many different opinions and ideas for the specific plans but the overall perception in the village was that the plantation was better managed in the past, provided benefits which it doesn't do today, such as employment, and was a much safer place to be. Two main ideas for the future of the plantation were identified in our interviews and are outlined below.

3.8.1 Improved management and security

This scenario includes building a fence around the plantation and ensuring security inside. It is perceived that this will provide employment opportunities to people who

have to cut the trees and takes care of the plantation. The main reason for this future scenario is the high perceived level of crime in the plantation.

The main constraints identified with this model are that fencing the plantation means a limitation in the open access in the plantation. Amongst our respondents there were different opinions about the impact of fencing the plantation (see table 15).

Table 14: Respondents opinions about fencing the plantation

- "If the plantation was fenced I would organize the community and go to the headman to negotiate permission." (PPM1).
- *"It would be very nice, it would make me safe"* (Q8).
- "If the plantation was fenced, people should pay a permission fee. 10 rand per bundle of firewood would be a realistic price." (Future scenario workshop)
- *"There is nothing I can do about it – I would go to the manager to ask for a job. I would feel bad but try to focus on the future."* (Q1 who makes his income from selling firewood from the plantation.)

Sources: Interviews and future scenario workshop

3.8.2 Business model

In this scenario the plantation management should be overtaken by a private company. This model is suggested by the ward councillor and negotiations have already begun with the headman. Private company management can be formed in different ways. The ward councillor suggested a model where a company such as Sappi (see table 16) could be responsible for the management of the plantation while the community still keeps ownership.

Table 16: Description of Sappi

Sappi is a South African paper production and forest products company, with international operations. They fund various corporate social responsibility (CSR) initiatives in proportion to their annual profits (May, 2006) including Project Grow, launched in 1983 in collaboration with the Gencor Development Fund and the KwaZulu-Natal(KZN) Department of Agriculture.

Source: Nawir et al. (2003)

The estimated timeline is that it will take seven years before the first harvest of the resources is ready and paper could be produced. Sappi should train people to take care of the plantation and a committee of local people should look after the plantation and

manage it for a salary. Additionally three to four same sized new plantation locations would be needed to make the project sustainable. The ward councillor expects a lot of benefits from this model: *"If we can manage the plantation the future is bright"* (Ward councillor interview). On the other side of the negotiations, we spoke to the headman who identified his main wishes about the future of the plantation as getting a plantation of pine or fruit trees, managed as a business. He also identified a police station as crucial to ensure security. He would not give a clear answer about his opinion about a project with Sappi. One of our respondents said that she would expect a benefit of this scenario to be employment and a 50/50 profit sharing between a private company and the community (Q7). In our future scenario workshop the number of 20 people employed was mentioned and the perception was that this was realistic in the future.

3.8.3 How changes will happen

The general perception of how changes will occur in the future is that the chief will have to make a decision and then the project will initiate from there. However the beekeeper, had taken initiatives himself to increase the flow of benefits from the plantation by initiating the bee hive project. *"The standard of living in my village and the country at large is the main reason for starting the beekeeping and I want to alleviate poverty myself himself instead of waiting for government."* The beekeeper participated in a three-day training in East London, South Africa in 2007 by the help of the agricultural office in Maluti and he got the boxes for bee hives from someone employed in the agricultural sector in Kokstad. The future plans for the project is *"to move it from a project to a business"* (beekeeper interview), which means increasing the scale, so that it can a benefit the community and create job opportunities.

4. Discussion

4.1 The condition of the available resources

The three stratums vary in average volume per hectare, number of stems and growth patterns. Similarly, the basal area of each stratum is different and it indicates that the plants covers very small area as compared to the area of the plantation and this gives lower volume and low density of the stands. The average volume is relatively low, which may have an impact on the future timber uses and sustainability of the plantation. This indicates high heterogeneity and fits with our sampling assumption from the aerial satellite photos.

The preference for collecting on the western side of the plantation clashes with the result from the forest resource assessment that this side of the plantation mostly have wattle trees, which are mostly cut (81%). Generally the trend is that the areas of cutting along the edges of the plantation have a high amount of wattle, indicating that wattle could be intruding on the plantation from these sides and thus potentially affecting the species composition. This could affect the use patterns of the plantation in the future. As plants are able to naturally regenerate the rate of resource degradation is not rapid. Furthermore, the access and use of alternative resources (86.7%) from the mountain and from buying will also reduce pressure on the plantation. There are many unmanaged coppiced, standing dead and burned trees and no thinning, pruning and proper coppicing practices are undertaken in the plantation.. Furthermore, there is an erosion problem. Therefore, due to these all issues, we can say that it is not well managed plantation which in turn has an impact on the sustainability value.

4.2 Mechanisms for plantation access

The following section compares our findings of formal and de facto use of the plantation according to Schlager and Ostrom (1992) definitions of access rights and Ribot and Peluso's (2003) subsequent theory of access.

4.2.1 Rights-base access mechanisms

The rights-based access mechanisms mean any involvement of community or government institution which will enforce a claim. Referring to Schlager and Ostrom's

(1992) terminology the results of our questionnaires and interviews places the local inhabitants as authorised users, with rights of access and withdrawal to the plantation (see table 17). From the minority of questionnaire respondents claiming to require permission for plantation access, four out of five lived away from the plantation and all were infrequent users. Therefore they could be less informed of current access arrangements and may be describing past situations. It could have been beneficial to attempt a PRA timeline activity, in order to gain more concise information. The headman and sub headmen have the plantation management rights, on behalf of the chief, whom holds the right of exclusion. The right of alienation belongs to the government, as owners of the land.

Table 17: Rights-based access mechanisms to the plantation and de facto access

Right	Schlager and Ostrom (1992) definition	Holder of right during apartheid, pre 1994	Current holder	De facto access
Access	The right to enter a defined physical property.	Local inhabitants, after payment	Local inhabitants	Inhabitants prepared to risk safety, male bias
Withdrawal	The right to obtain "products" of a resource	Local inhabitants, after payment	Local inhabitants	Inhabitants prepared to risk safety, male bias
Management	The right to regulate internal use patterns and transform the resource by making improvements	Headman and sub headman regulate use; government employees modify resource	Headman and sub-headman on behalf of Chief Moshsweshwe	Resource unregulated and unimproved
Exclusion	The right to determine who will have an access right, and how that right may be transferred.	Chief Moshsweshwe, enforced by government	Chief Moshsweshwe	Right enforced for larger modifications (e.g. fencing one section for hives)
Alienation	The right to sell or lease either or both of the above collective choice rights.	Government	Government	Permission required from Chief Moshsweshwe to avoid resistance

Source: Interviews and questionnaires

As predicted by Ribot and Peluso's (2003) theory of access, the de facto use patterns of the plantation by these actors do not correspond to their access rights. Many local inhabitants feel threatened by crime inside the plantation, which decreases their

possibility of access and withdrawal, influenced by personal factors such as gender and perceptions. Since the chief is the actor most strongly perceived with power to make decisions over the plantation, the government may come across considerable resistance in any attempt to exercise the right of alienation.

The Ward councillor identified the need to make an annual report of income and usage, in order to collect payment, as the underlying cause of change in access to the plantation. This implies that the government ceased to make the report and the traditional authorities lacked the capacity to do so. Therefore they retained the *rights* of management and exclusion, but without actual *ability* to exercise these rights, thus the plantation is considered a common pool resource. Maintenance and control of access are complementary processes (Ribot and Peluso, 2003). Since the chief ceased to control access and does not collect payment, financial resources for maintaining the plantation are now unavailable. The Ward clerk may have the capacity to make a report of plantation income and usage, on behalf of the local government. However, these administrations cannot control the plantation access since they do not have the power.

4.2.2 Structural and relational access mechanisms

The a*ccess to technology* is a constraining factor on enjoying full benefits from the plantation. More advanced technology can benefit those who can access it, but in Mpharane there is limited access to machinery to process poles into planks and subsequently these are bought in town. Even the carpenter buys his poles from town or builds traditional houses with non-treated poles (carpenter interview). The beekeeper would also benefit from honey processing technology to increase efficiency and enable commercial scale production. However these technologies would require *access to capital*, which is not forthcoming according to our key informants. Market competition for timber exists in the neighbouring region of Zululand (Nawir et al. 2003). If our above analysis about causes of plantation access changes was accurate, lack of knowledge in report writing skills would be a major factor in preventing effective management. Lack of knowledge in forest management may also be a factor. In the plantation the beekeepers have privileged access to their own area, in this sense they have a special *access to authority*, because they have exclusion rights and a constitution. As such there is potential to add value to plantation products, with the addition of technology for

sawing wood or honey processing, which would enable sales in the village. Also our respondents valued monetary incomes higher than the general use of plantation products.

From the time frame of our field investigation, it is not possible to be conclusive. We would need to conduct further interviews with key informants to deepen our understanding of access factors and confirm our interpretation of the situation. In addition, it would have been useful to interview the plantation committee, which we could not do since we did not discover their existence until immediately prior to departure. This could be because the group is not very active; therefore informants were unaware of their presence. It may have been productive to specifically ask about the presence of committees, or use more participatory methods with key informants regarding institutions such as a Venn diagram (Mikkelsen, 2005). This may have provided a more open opportunity for them to decide what was important to mention, rather than simply answering the questions we asked.

4.3 Benefits of plantation use and impact on livelihoods

This section discusses how the plantation benefits people and their livelihood. Having a look at the results of the applied questionnaires, it is obvious that the plantation provides benefits as a supply of subsistence goods and is important for people's livelihood (83,3 percent use the plantation). Because of the lack of electricity three-fourths of the households use firewood as a source of energy. Additionally every second household collects poles for roofing and fencing. However, people mainly use the plantation for subsistence use and not for selling (only 1 out of 30 questionnaires). This can be explained by the fact that there is open access and thus no market for selling poles. As discussed above the access to technology is a major constraint for increasing the value of the plantation resource.

The hypothesis "the poorer a household, the more dependent it is from the plantation" was defined for the research. While there is at least a hypothesis supporting trend in the rate of who the users of the plantation are (85,7% of poor, 83,3% of average and 80,0% of the wealthy households use the plantation), the calculation of the value people collect implies that persons from wealthier households collect the highest value out of the plantation (698,6 Rand per year), followed by the poor (415,9 Rand per year) and average (406,2 Rand per year). Thus the hypothesis is cannot be supported. Our small amount of applied questionnaires might be a major determining factor for resulting in these hypothesis falsifying results. Calculating the variances of these results makes clear that the standard deviation is extremely high (see table 18).

Table 18: Value of Firewood collection (per Person and year)

	Poor	**Average**	**Wealthy**
Value (in Rand)	415,9	406,2	647,0
Variance	366520,6	476664,4	841863,5
Standard Deviation	605,4	690,4	917,5

Particularly high is the standard deviation from the wealthy household group, which sample size was the smallest (5 households, 14 people). Since the standard deviation from the average household group is still higher than the one from the poor households, even though the sample size is much higher (17 average households with 83 people, only 7 poor households with 29 people), the trend is that there is no correlation between wealth of a household and the forest use. Also it might be possible that wealthier households do not possess the financial means, or the intention, to change to alternatives, such as gas or solar generators. There is also a risk of inconsistency in our categorization of households into wealth groups, since they were only based on visual observations of wealth indicators. A more in depth livelihood analysis of each could have resulted in more precise categorization, but it was our priority in the field to collect data on plantation use in our questionnaires. Additionally we conducted our interviews during daytime, when people were at work or in school so our respondents were mainly old women (average age of 61 years) who might not know the full use pattern of the household. Finally our initial hypothesis can be questioned; Shackleton (2004) describes, referring to Byron & Arnold (1999) and Cavendish (2000) that *"wealthier households [...] may well use greater amounts of forest products than poorer households,*

but this represents a smaller proportion of their total income streams than that of poorer household." Since income measurements were not included in our research, it is difficult to put a value on the relative importance of the plantation to people´s livelihoods. This could have been done by finding out the willingness to pay or opportunity cost for forest resources. Alternatively our livelihood ranking could have been applied in all our questionnaires, giving us a larger quantity of answers.

The second hypothesis that further away households are less dependent from the plantation is, as a consequence of the small amount of interviewed households, not clearly verifiable. While the use in general of the plantation is almost the same, 85% of the nearby and 80% of the further away households collect resources in the plantation, there is still a trend recognizable: the nearby households collect more firewood (85,0 percent) than the far away (60,0 percent, all collecting by tractor). The plantation is the only source for fencing and roofing poles in the area because wattle is not well suited for constructions and thus almost equally important for the nearby and far away households. To conclude, only 17,4 percent of plantation-firewood users collect only from the plantation, the rest is also using firewood from the surrounding mountains.

4.4 Obstacles and constraints to plantation use

Safety in the plantation is a big issue, since 87,0 percent of the women and 33,3 percent feel unsafe inside. Most mentioned reasons are crime activities, such as raping, killing or kidnapping. However, the stated reasons in the questionnaires, mentioned by people why they are not using the plantation, had no relation to crime: Distance to the plantation, snakes, the smell of the plantation and the alternative of using a stove. To proof the hypothesis, if crime in the plantation affects people´s patterns of using the plantation, follow-up interviews were conducted with 5 households, and crime activities do influence peoples patterns: "*I would go more often into the plantation, if there was no crime"*, (PPM3). Q1 is fearing crime in the plantation, but "*has to face it*", because it is his main source of income. Q13 only collects from the edge of the plantation, because she is too afraid of going inside. Some of the answers were unclear, as Q8, who in the questionnaire response did not use the plantation, but in the interview actually had a use of poles for roofing out of the plantation. A higher amount of probing and analyzing field data on an ongoing basis could have been a problem solving measure. The phrasing

of the question *"Are you using the plantation?"* in the questionnaires and the follow-up interviews could also have been improved, as it is not clear, if individual responding use it himself, send somebody else or pay someone for collecting. In other words: The terms "using" and "collecting" are equalized in our questions, even if use is possible without collecting yourself. This could explain why Q8, a 77-years old wealthy woman, fears the crime in the plantation but negates the question, if crime is influencing her collection patterns: she might not collect by herself.

4.5 Expectations and Realistic Future Scenarios

There are many potential contradictions between the villagers' expectations in regards to plantation future scenarios and the actual likely outcomes based on literature and key informant interviews. This section discusses the future scenarios outlined at the end of the results section.

4.5.1 Scenario: Business model

Sappi's CSR initiative, Project Grow, aims to uplift rural communities through provision of finance, free seedlings, technical assistance and a secure market for timber to smallholder farmers in KZN, currently with around 8000 growers and 13000 ha (Nawir et al, 2003). The company's policy is to prioritise communities within twenty kilometres of their commercial operations and plantations. They only establish commercial plantations on land they own themselves (May, 2006). Although it is not possible to be conclusive without further interviews, comparing the ward councillor's responses with literature on Sappi best fits a future scenario of Sappi assuming ownership and operations of new plantations within Ward 13 approximately three to four times the size of the existing plantation, whilst simultaneously funding local growers under the criteria for Project Grow or similar. It should be stressed that although Sappi provides positive benefits through their community project, their main interest is in making profit. "*The reality is that Sappi makes an impact upon those people living in these communities and has a responsibility to offset these impacts" (May 2006).*

The main obstacle with the business model is that access will be limited. Wattle provides an abundant alternative, however, distance to the mountain is greater than to the plantation for most residents (except Q25-30) because the crossing place of the river is

behind the plantation, as indicated in PPM3 exercise (see figure). Consequently, firewood prices will increase with loss of plantation access, whether the cost is monetary resources or the users own labour for collection. Indirectly, increased collection in the mountains could impact negatively on traditional medicines, which are already at less than desirable levels (Sangoma and practising traditional healers). The alternative for roofing poles is to buy them in town, again with an increased cost.

Another interesting aspect of the business model is the amount and type of benefits the local community will get. By comparing the perceptions and expectations of ownership arrangement, profit sharing, quantity and duration of generated jobs with independent descriptions of Sappi (Nawir at al, 2003;May,2006), local expectations are unrealistically optimistic. We saw little evidence that community members had the strong negotiations skills required to receive an equitable deal with a corporation,Q1 immediately conformed his responses away from his own interests in the presence of the group.

4.5.2 Scenario: Improved management and security

The scenario of re-instating management within the plantation could bring both physical and social benefits. Since the density of the plantation is heterogeneous, thinning the densest areas would increase productivity by improving the growing conditions for the remaining trees by reducing competition. A similar result could be achieved with selective harvesting, by controlling use patterns (Meilby and Nord-Larsen, 2012). A greater abundance of pine could be planted, since some informants, including the carpenter showed a preference for this species, which appears very sparse from our transect walk. Disease, pest and erosion monitoring and fire prevention can provide additional benefits. A significant social benefit of this scenario of increased security and improved management would be a reduction of crime in the plantation. However, it is arguable whether preventing crime in the locality of the plantation actually reduces crime or simply relocates it to another location. One of the confirmed community ward based priorities for the 2011/2012 IDP review is a new satellite police station in Ward 13 (Matatiele Local Municipality, 2012). Additional social benefits may include improved recreational value of the plantation. Increased firewood provision from the plantation could reduce wattle collection using cattle from the mountains, indirectly alleviating trampling of traditional medicines.

If this solution should be implemented locally, payment would need to be collected to finance the management and security, which our focus group showed willingness to pay for. A bookkeeping system will be required, which stresses the importance of accountability and trust of the headman securing a proper use of the money: "Transferring power without accountable representation is dangerous. Establishing accountable representation without powers is empty." (Ribot, 2002). The ward councillor has accountable representation, but no power to make decisions over the plantation, whereas the chief has the power, but without an apparent means of accountable representation. Therefore collaboration between these actors could be key, if they are able to negotiate and agree on new systems of access. Improved communication between various scales of government might also be beneficial to bring in support need to provide necessary access mechanisms such as capital (Ribot and Peluso, 2003).

If the system could be sustainable the profits could go to a community fund as they have in the past, in contrast to the previous scenario. Forest resources can function as an important component for livelihoods and the possibility to increase benefits from the resource by providing a source of income generation could be part of a livelihood strategy to decrease the state of poverty (Oksanen et al., 2003). According to Ellis and Freeman, wealthier households are distinguished by spirals of accumulation by applying a diversification strategy to livelihoods, including non-farm income sources (Ellis & Freeman, 2004). Production and sales of plantation resources could be a component of such spirals. However, the correct access mechanisms of technology, capital, access to markets (including improved road infrastructure) would first need to be in place as previously discussed. The main obstacle with this model is the difficulties and uncertainties of implementation.

5. Conclusion

The Mpharane plantation provides beneficial, but not indispensible, resources to the local people to support and diversify their often vulnerable livelihood strategies. There are no rights-based access mechanisms restricting the use of the plantation and it can be considered a common pool resource, meaning that the access is free for everyone.

The plantation consists predominantly of eucalyptus, with various other species which are regenerating and distributed without visible planning. The resource is characterised by physical heterogeneity, and uneven cutting patterns, although high cutting is seen around the edges. The benefits are mostly subsistence goods, supplying basic subsistence needs of firewood for energy use and building materials (Shackleton, 2004). Only a few benefits from employment were identified such as selling firewood and traditional plants and also a private carpenter business. People living near the plantation collect most of their firewood in the plantation, while people at further distance tend to use the alternative resources such as wattle from the mountain. Because of the species composition inside the plantation it is preferred for fencing and roofing poles over the mountain.

The open access and lack of management of the plantation has certain constraints on the potential benefits of the plantation, these include high perceived levels of crime and fear of snakes. Access was previously controlled and maintained with the influence of governmental departments during the Apartheid era and this scenario is largely perceived as preferable to the current situation by our respondents. To improve possibilities for plantation access, a key area for investigation is the collaboration between traditional and elected authorities and macro scale political institutions, to negotiate a solution which still benefits the community. The ability to enjoy further benefits from the plantation is also constrained by a lack of access to technology and knowledge in the village, making processing of the resource difficult (e.g. honey and planks).

Two possible future scenarios were identified. The first is increased security, management and fencing by the local community and the second is management by a private company. Both scenarios have implications for the users and will affect the mechanisms for gaining access to the plantation (Ribot and Peluso, 2003). We conclude

that there is a need to have proper expectation setting in the community about each of the suggested scenarios before any changes are made to the plantation. A more in depth analysis of the benefits and dependency on the plantation resource is also needed. At least until Mpharane is electrified, the dependency on firewood is large.

6. References

Bennett, J; Ainslie, A. and Davis, J. (2013): Contested institutions? Traditional leaders and land access and control in communal areas of Eastern Cape Province, South Africa In: Land Use Policy 32, 27-38

Byron, N. & Arnold, M. 1999. What futures for the people of the tropical forests? World Development, 27: 789-805.

Carnus J.M., Parrotta J., Brockerhoff E.G., Arbez M., Jactel H., A Kremer A., Lamb D., Hara K.O., Walters B.(2003): forests and biodiversity. *Delivered at UNFF International Experts Meeting on the role of planted forests in Sustainable Forest Management*. New Zealand.

Cavendish, W. 2000. Empirical irregularities in the poverty-environment relationship of rural households: evidence from Zimbabwe. *World Development*, 28: 1979-2003.

Cayuela L., Arriaga S.R., Ozers C.P.(2011): Honey bees increases fruit set in Native Plant Species important for Wild life Conversation. *Environmental Management,* 48: 910-919; Madrid, Spain.

DFID (1999): Sustainable livelihood guidance sheets. Chapter 2.1.-2.6.

Ellis, F. (2000): Rural livelihoods and diversity in developing countries. Oxford University Press, Oxford, 300 pp

Ellis, F. and Allison, E. (2004): Livelihood diversification and natural resource access. LSP Working Paper 9. Food and Agriculture Organization of the United Nations – Livelihood Support Programme

Ellis, F. and Freeman, H.A. (2004): Rural Livelihoods and Poverty Reduction Strategies in Four African Countries. *Journal of Development Studies*, Vol.40, No.4, April

Freese, F. (1976): Elementary Forest Sampling, Agricultural Hand Book No. 232. US Department of Agriculture, Forest Service.

GAO (1993): Developing and Using Questionnaires . United States General Accounting Office. Program Evaluation and Methodology Division

Foth,H.D. (1990): Fundamental of Soil Science. Eighth edition. Michigan State University.

Husch, B., Beers, T. W. & Kershaw J. A. (2003): Jr.2003. Forest Measuring, 4th Edition. John Wiley & Sons, Inc., Hoboken, New Jersey.

Jick, T.D. (1979): 'Mixing qualitative and quantitative methods: Triangulation in action', *Administrative science quarterly*, vol. 24, no. 4, pp. 602-11.

Hall, J.B. and Rodgers, W.A. (1992): *Rural development forestry Network*. Buffers at the Boundary. Bangor, Wales.

Leach, M., Mearns, R. and Scoones, I. (1999): Environmental Entitlements: Dynamics and Institutions in Community-Based Natural Resource Management, *World Development*, **27**(2): 225-247

Little, E.L., Jr. (1981): Common Fuel wood Crops. Communi-Tech Assoc., Morgantown, West Virginia.

Matatiele Local Municipality (2012): Confirmed community ward based priorities for the 2011/2012 IDP review.

Matatiele Local Municipality (2012): Situational Analysis for the 2011/2012 IDP review.

May, J. P. (2006): An understanding of corporate social investment within the context of the Sappi Forest Products Division in South Africa (Doctoral dissertation, Rhodes University).

Meilby, H., & Nord-Larsen, T. (2012): Spatially explicit determination of individual tree target diameters in beech. *Forest Ecology and Management*, 270, 291-301.

Mikkelsen, B. (1995): Methods for Development Work and Research – A new Guide for Practitioners. Sage fourth edition, New Delhi. Chapter 3

Nawir, A. A. et al. (2003): Towards equitable partnerships between corporate and smallholder partners: relating partnerships to social, ecoomic and environmental indicators: workshop synthesis.

Oksanen, T., Pajari, B., Tuomasjukka, T. (2003): Forest in Poverty Reduction Strategies: capturing the potential. European Forest Institue proceedubfs No 47, 2003

Ostrom, E. (2002): Common-pool resources and institutions: Towards a revised theory. Handbook of Agricultural Economics, Volume 2, Edited by B. Gardner and G. Rausser. Elsevier Science B.V.

Owen, D.J. and van der Zel, D.W. 2000. Historical development of SA forestry. *In*: Anon.(eds.) South African Forestry Handbook Vol 1, 3-4. South African Institute of Forestry,Menlo Park.

Parnwell, M. (2006): Robert Chambers. Pp. 73-78 in Fifty Key Thinkers on Development. Edited by David, S.

Paumgarten, F. (2005): The Role of non-timber forest products as safety-nets: A review of evidence with a focus on South Africa. GEOJOURNAL. Volume 64, Number 3 (2005), 189-197

Ribot, J. C. (2002). Democratic decentralization of natural resources: institutionalizing popular participation (p. 30). Washington, DC: World Resources Institute.

Ribot & Peluso (2003): A Theory of Access. Rural Sociology 68 (2), 2003, pp. 153-181

Rosumek F.B., Silveira F.A.O. , Neves F.S., Barbosa N.P.U., Diniz L., Oki Y., Pezzini F., Fernandes G.W., Cornelissen T.(2009): Ants on Plants : a meta-analysis of the role of ants as plant biotic defences . *Oecologia,* 160: 537-549 ; Brazil.

Shackelton, C. (2004): Assessment of the livlihoods - Importance of forestry, forests and forest products in South Africa.

Schlager, E. and Ostrom, E. (1992): Property-rights Regimes and Natural Resources: A Conceptual Analysis. In *Land Economics*, August 1992, 68(3): 249-62

Appendices I - IX

Appendix I – Questionnaire data and meaning summaries of the interviews

Questionnaire Data:

Questionnaires - Result table					
Household No.			1	2	3
Name & Age			Reaoboka Hlaki, 22	Mantsau Ntsau, 84	Vincent Dliloo Sekoateng, 67/67
Sex			M	F	M + F
Wealth Ranking			Average	Average	Average
Collection Square					
1) How many people live currently in your household?			4	3	11
2) Do you or anybody in your household uses the plantation?			Yes	Yes	Yes
3) Do you or anybody in your household collects [a-f] from the plantation?					
	3a) firewood		Yes	Yes	Yes
		3a1) How often?	5 times a day	2x / day	2 times a day
		3a2) How much?	Wheelbarrow	2-3 sticks	Hands
		3a3) Sell it?	Yes	No	No
		3a4) For yourself?	Yes	Yes	Yes
		3a5) How much $?	45R / Wheelbarrow		/
	3b) poles for fencing		Yes	Yes	Yes
		3b1) How often?	2 times a day	as needed	2/3/4 times a year
		3b2) How much?			as needed
		3b3) Sell it?	Yes		No
		3b4) For yourself?	Yes		Yes
		3b5) How much $?	10R per pole in community, 14R per pole o		/
	3c) poles for roofing		Yes	No	Yes
		3c1) How often?	As needed		As needed
		3c2) How much?	As needed		As needed
		3c3) Sell it?	Yes		No
		3c4) For yourself?	Yes		
		3c5) How much $?			
	3d) berries/fruits		Yes	No	No
		3d1) How often?	As available		
		3d2) How much?	AS available		
		3d3) Sell it?	No		
		3d4) For yourself?	Yes		
		3d5) How much $?	/		
	3e) medical plants			No	Yes
		3e1) How often?	/		As needed
		3e2) How much?	/		As needed
		3e3) Sell it?	/		No
		3e4) For yourself?	/		Yes
		3e5) How much $?	/		
	3f) others			No	No
		3f1) How often?	/		/
		3f2) How much?	/		
		3f3) Sell it?	/		
		3f4) For yourself?	/		
		3f5) How much $?	/		
I) Why not? (i.e. Use products from the plantation)			/		
4) Do you collect forest products from other places outside the plantation?				No	
	4a) firewood				
		4a1) How often?	No		2/3 times a day, from plantation or mountain
		4a2) How much?	/		hands or cattle
	4b) poles for fencing				
		4b1) How often?	No		As needed
		4b2) How much?	/		As needed
	4c) poles for roofing				
		4c1) How often?	No		/
		4c2) How much?	/		
	4d) berries/fruits				
		4d1) How often?	No		
		4d2) How much?	/		
	4e) Medicinal plants				
		4e1) How often?	As needed		As needed
		4e2) How much?	As needed		As needed
	4f) Others				
		4f1) How often?	/		
		4f2) How much?	/		
5) Do you ever buy forest products?			No	Yes	Yes
	5a) Which ones?			Poles	Roofing planks from town
6) Do you need permission?				No	No
	6a) From whom?				
	6b) For which products?				
7) Do you have to pay to use the plantation?			No	No	No
8) Do you feel safe, using the plantation?			Yes	No	Man, yes;women, no
	8a) Why not?			Crime	They may rape, kidnap or kill her
9) Do you have anything to add?			Yes, see extra doc		
10) May we contact you again?			Yes		Yes

4	5	6	7	8	9	10	11
Katleho, 23	Matilde, 34	Matsuku Moeti, 70	Grace, 63	Malabese Emily Lenyane, 77	Zulumane, 65	Nothulani Tenene, 40	Pascoi Thikiso, 68
M	F	F	F	F	F	F	M
Average	Wealthy	Average	Average	Wealthy	Poor	Wealthy	Wealthy
15	16	?	?	?	?	?	roofing: 2/3, firewood: 6/7
4	4	4	1	2	10	4	3
Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Yes	Yes	Yes	Yes		Yes	Yes	Yes
1x/month	1x / week	1x / year	as needed (for funerals)		1x / year	2x / week	3x / week (hands), 6x / year (tractor)
Wheelbarrel load	headload	headload			tractor load	headload	hands, tractor
No	No				No	No	No
Yes	Yes				Yes	Yes	Yes
Yes	No	Yes	No		Yes	No	Yes
every 2nd year		1x / year			As needed		
N/A							
							No
							Yes
No	No	No	Yes		No	No	Yes
			last time: 2006				every 20 years
							tractor load (20 Sticks)
							No
							Yes
Yes	No	Yes	No		No	No	No
When he is there for firewood collection		2x / year					
No	No	No	No		No	No	Yes
							as needed
							handload
							No
							Yes
Yes, sticks for pigshelter	No	No	No		No	No	No
				Uses stove			
No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	?	1x / year	?	1x / year		as needed	12x / year
	?	1/2 tractor load	?	1 tractor load		1 tractor load	180 bundles
	No	No	No	No	No	No	No
	No	No	No	No	No	No	Yes
							every 20 years
	No	No	No	No	No	No	No
	No	No	Yes	No	No	Yes	Yes
			2x / year			4x / year	as needed
	No	No	No	No	No	No	No
Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Roofing poles (if he is bu	Planks	Planks, Furniture	Poles, Planks	Fencing poles	Doors		Planks, Furniture
No, long ago you had to	No	No	No	No	No	No	Yes
							King Mushweshwe
							All of them (but you can take as much
No	No	No	No	No	No	No	No
No	Yes	No	No	No	No	No	Yes
Snakes		Snakes, Mosquitos	Killing, Raping		Killing	Anybody can come unexpected	
Yes		743377788	731906812				
	Uses, Gas & Parafin; 1/2 tractor load -> 500 Rand			Reason of not going to the planta	Has to pay the wo	Do you have to pay: "It may happen, but never happens"	

12	13	14	15	16	17	18	19
Smuts Otsoitsoa, 78	Alina Phati, 77	Josina, 68	Cathrina Liamakasto, 51	Dira Moeti (M) 71, Mamoll (F) 57	Thulang Mushweshwe, 49	Shadrack Ntlgankoe, 48	Nthabeseng Melato, 47
M	F	F	F	M+F	F	M	F
Poor	Poor	Average	Poor	Average	Average	Wealthy	Average
6 and 7		6, 8		3,4,5,7	6 and 7	4 and 5	
1	3	3	5	7	3	1	7
Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Yes	Yes	Yes		Yes	Yes	Yes	Yes
3x / week	1x / day	1x/day		3x / week	1x / month	4x / year	1x / year
2 sticks	4 sticks (headdload)	headload		2 sticks	20 sticks	hands	tractor load
No	No	No		No	No	No	No
Yes	Yes	Yes		Yes	Yes	Yes	Yes
No	Yes	Yes		Yes	No	No	Yes
	every 2 year	every 2nd year		1x/month			1x / year
	as needed	as needed fro a fence		as need for fence			
	No	No		No			
	Yes	Yes		Yes			
No	Yes	Yes		Yes	No	Yes	Yes
	every 20 years	every 5th year		every 2nd tear		every 20 years	every 10 years
	as needed for whole roof change			as needed for roof			
				No			
				Yes			
No	No	Yes		No	No	Yes	No
		Children collects occasionally				1x / year	
No	No	Yes		No	No	No	No
		When ill					
No	No	Yes		No	Yes, stable for donkeys	No	No
			Afraid of snakes				
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	From mountain 3x/year	Yes	Yes	Yes	Yes	Yes
	4x / year		1x/week	1x/year	2x / week	1x / month	3x / week
60 Trees (280 Rand)	cow load (20 - 40 sticks)		3 people load	15 sticks	5-6 sticks	tractor load (80 sticks)	headload
No	No	No	Yes	Yes	Yes	No	No
			1x/year	1x/year	1x / year		
			One wheelbarrel	as needed for fence	30 poles		
No	No	No	No	No	No	No	No
No	No	No	No	No	No	Yes	No
						1x / year	
No	No	No	Yes	No	Yes	Yes	yes
			Only in summer		as needed	as needed, not in winter	4x / year
No	No	No	No	No	No	No	No
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Planks, doors, poles	planks, furniture	Poles for fencing, roofi	Poles, planks, doors	Planks for roofing, furniture, doors	furniture, planks	furniture, planks	furniture, planks
No ("I go during the n	No	No (pays someone to c	No	No	No	No	No
ı as you want)							
No	No	No	No	No	No	No	No
Yes	No	Yes	No	No	No	Yes	Yes
	Snakes		Snakes, raping. She knows son	Snakes, raping	Snakes, raping		
		Yes		Yes			

20	21	22	23	24	25
Malebegee, 42	Mothibeli Taona, 41	Paskalina , 80	Matenza Tenza , 86	Beauty , 82	Anstia Tenza , 72
F	M	F	F	F	F
Average	Poor	Average	Average	Poor	Average
	?	?	?	?	?
7	2	2	2	2	4
No	YES	YES	YES	YES	YES
	YES	YES	YES	YES	YES
	yes	YES	YES	YES	No
	once a year	ONCE A YEAR	once a year	Every 4 month	
	Full tractor	FULL TRACTOR	Full tractor	Full Tractor	
	yes	YES	No	yes	No
	After several years	WHEN NEEDED		when needed	
	50 ploes	20 POLES			
	yes	YES	No	yes	yes
	once for the last years	WHEN NEEDED		when needed	when needed
	50 poles	Bunch of woods		full tractor	Half tractor
	yes	no	No	No	No
	once ayear				
	yes	yes	No	No	yes
	once a year				when needed
	full plastic bag				
	yes				
	yes				
	20 rand for 750ml				
	yes	yes	yes	No	No
	once a year, wagen	per two years, wagen	when needed- wagen ,		
			chair, steep ladder		
Plantation smells					
Yes	yes	yes	yes	yes	YES
Yes	yes, from mountains	yes, from mountain	YES; wattle from mount	once a year	Once a year
2x / year	several x / year	once a year	once a year	full tractor	Full tractor
30 sticks		Full tractor	half a tarctor		
Yes	no	No	No	No	No
every 2 years					
No	no	No	No	No	No
Yes	no	No	No	No	No
1x / year					
Yes	yes	No	No	No	yes
1x / week	several x / year				when needed
No	no	No	No	No	No
Yes	yes	No	yes	No	yes
planks, building mat	fencing poles, benches		fencing poles		fire wood
No	yes	yes	No	yes	No
	from Tailor Mahlaku	Moutumi halki, head man		from the head aman	
		Fencing poles and firewood		fencing poles , fire wood	
No	yes, 2 rand / pole	No	No	No	No
No	yes	No	No, prefer to go in grou	No	No
Snakes, smell		i have no power , fear	rape and other crimes	Rape and other crin	fear of rape
	yes, 0711635872		yes, 0837677760		yes, 0765230097
	600-700 Rand/tractorload				

26	27	28	29	30		
Madi Kotsi Letjeloane, 88	Grace Gugushe, 81	Alena Ramatlapeng, 69	Victoria Pina, 39	Gugushe Mamotsekae, 45		
M	F	F	F	F		
Average	Poor	Average	Average	Average		
6	6	7				
4	4	10	6	5		
Yes	Yes	No	Yes	No		
Yes						
Yes	Yes					
Once a year	Twice a year	/	/			
Full tractor	Tractor or cattle load	/	/			
No	No	/	/			
Yes	Yes	/	/			
/	/	/	/			
Yes	Yes					
As needed	Depends on money	/	/			
Full tractor	Full tractor	/	/			
No	No	/	/			
Yes	Yes	/	/			
/	/	/	/			
Yes		Yes	Yes			
As needed	/	Once a year, untill the hou	Once a year			
Full tractor	/	/	16 Poles			
No	/	/	No			
Yes	/	/	Yes			
/	/	/	/			
/	/	/	/			
/	/	/	/			
/	/	/	/			
/	/	/	/			
/	/	/	/			
Yes						
Once a month	/	/	/			
As needed	/	/	/			
No	/	/	/			
Yes	/	/	/			
/	/	/	/			
Yes, Benches						
As needed	/	/	/			
As needed	/	/	/			
No	/	/	/			
Yes	/	/	/			
/	/	/	/			
/		It's not better than wattle		Free to use the mountain		
	No					
	/					
Once a year	/	Every day	2/3 times a year	Every day		
Full tractor	/	Full tractor's worth every	/	As much as can carry		
	/					
As needed	/	/	/			
As needed	/	/	/			
	/					
/	/	/	/			
/	/	/	/			
	/					
/	/	/	/			
/	/	/	/			
	/					
As needed	/	/	/			
As needed	/	/	/			
	/					
/	/	/	/			
/	/	/	/			
No	Yes	No, she sends her sons	Yes	Yes		
/	Traditional medicines, benches		Fencing poles, som	Fencing poles, roofing poles, chairs		
	No	Doesn't know, used to ask	No	Yes		
Various community members		/		Rametsi, one of the community members		
Firewood, fencing poles, roofing poles		/		Access and fencing poles		
300R		No	No	50R		
No, they employ people to	No	No	No	No		
	Afraid of being killed, kidn	The forest doesn't look we	Snakes, people, cri	Looks very untrustful because of undergrowth		
Yes see extra info doc	Yes, see extra doc		Yes, see other doc			

Meaning summaries:

Future scenario workshop - Friday

This was a two hour workshop , including four participants (Q1, Q8, Q17, PPM1) who were sampled from previous questionnaires and interviews. The aim of the workshop was to get perceptions on current management practices as well as perceptions on future scenarios.

Preparation

Themes for discussion:

- Current management (discuss plus and minus)
- Future scenarios/opportunities (discuss plus and minus)

Possible scenarios:

- Private company taking over
- Community management
- Status quo – open access

Questions:

- How will this affect you personally?
- What impact will it have on your community?

Summary

Discussion about the current management: The plantation has great importance, especially the gum tree. Q1 uses it for selling.There is enough wattle inside the plantation already. There is no management right now, Q1: *"In the plantation I have met people with drugs and guns.".* The current crime in the plantation happens because it is not managed and there is more crime in the plantation than the rest of the village.

Future perceptions: It should be fenced and there should be people to manage it and ensure security. Having a fence would limit the use to those paying for a permission letter with the chief. PPM1: *"10 Rand per bunch of firewood is what we can afford"*. For future changes, PPM1 said: *"There should be negotiations towards a better future with the king and the community.*". A wish is that the plantation is increased in size by the top of the plantation (community land) because the population is growing. Plank trees are preferred, because the other trees are already there (eucalyptus, gum tree). PPM1: *"Then maybe there could be companies producing planks.".* There could also be grape trees in a separate location for making wine. Decisions about future management should be made by the chief, but many people should work there cutting leaves, cleaning up the plantation. In case a private company manages the plantation, it should obey the community rule. It should share with the community because the community owns the land (50/50). If the plantation is managed by the community, there should be a

community account for the profit which should be used to maintain the plantation. The benefits of having a private company manage the plantation would be (Q8): *"There will be many job opportunities; the company will select people to work there, especially the youth"*. In the past more than 20 people worked there because in each subvillage there was one person responsible person. If Sappi came to manage the plantation, the benefits would be good management and no corruption If the plantation was fenced it would mean that Q1 would lose his main source of income: *"There is nothing I can do about it – I would go to the manager to ask for a job. I would feel bad but try to focus on the future."*

Follow-up with Q no. 1 (Gitte and Johannes)

Ranking

1) Private business } connected. Sells products from the plantation
2) Forest Products from Plantation }
3) Jobs (hired by someone) small jobs
4) Forest Products from outside not connected to private business, own use only
5) Homegarden sometimes for selling it
6) Social grant

Summary

- Gum tree for firewood. Oinetree for planks, eucalyptus for poles, wattle is collected in the mountains.
- Knows of many people have been chased inside the plantation. But no measures are taken against them. *"Crime prevents him to go there, but he has to face it."*. There is a difference, the crime started after 2000. The crimes stated because of the drug (Dagga). It is illegal and people sell it and hide it inside the plantation.
- It would be beneficial to have a private company manage the plantation,making furniture and paper, but it is the kings decision. It should be managed and there should be 24 hour security so that there is no crime in there. It would be an opportunity for him because then he can work without being afraid. However fencing would prohibit him from accessing the resources he needs for selling, he can do nothing – only hoped that he will be allowed to collect anyway.

Follow up interview with Q nr. 8

Ranking exercise

1. Pension
2. Social grant
3. Home garden
4. Money from relatives
5. Private business
6. Private business
7. Forest products from outside the plantation

Selling vegetables, private business, her children send her money every second month, she sold her livestock in the past (she is old). Number 6. And 7. Are not very important for her. “I cannot survive without pension and the social grant – it is a reliable income”.

Summary

- She collects gum tree because it is than eucalyptus tree. The pines are not high quality. It is only used for roofing.
- She knows of someone who was raped inside the plantation. The violator was caught.
- In the past you had to pay to access and the government claimed money. She doesn’t know if you still have to pay. The management was better in the past due to increased security. A lot of people were employed inside, some even living inside the plantation.
- Having a private company: *“It would be very nice, it would make me safe.”.* A fence would help prevent crime. She eishes the plantation could be a business. Benefits would be that people can get jobs and that will be a huge change. They should patrol and clean up the plantation. She would prefer a private company managing the plantation over the community. Because she knows humility. In the community people will fight over positions and there will be bloodshed. Now everyone can go there but if a private company managed it, the owner could follow up on it and call the police.

Follow-up with Q no. 13

Ranking exercise

1. Social grant
2. Homegarden
3. Forestproducts from the plantation

She never worked, so she has no pension and she has never been hired. Homegarden for self-use. Gets a social grant of 1000 R/month. She hires someone to collect wattle for her in the plantaion.

If we remove the plantation: She will hire catlleto collect wattle from the mountain (using the social grant). If she didn’t have the social grant she would have to depend on crops and homegarden.

Summary

- She collects gum tree (white) for firewood – it burns fast. Pine for fencing, it is stronger.
- The plantation has no traditional value, it is only for domestic use.
- She only collects from the edge of the plantation because she is afraid to get inside. She knows of a raping incident, which happened inside the plantation.
- You don’t have to pay to use the plantation now. In the past it was controlled by the government, who also built houses inside for those who looked after the plantation. They cut trees for people and brought it to the tractor. 3 people in total with full time jobs worked there in the past. They allowed people with permissions to enter the plantation. There were many others who were employed to some extend.
- If a private company managed the plantation, she would have to pay for her firewood. It would not be a surprise to her because it has happened before. She will have no other

options because she needs the firewood. The company should bring some change. She would be glad if the company would come up with some jobs for her children.

- If the plantation was fenced she would hire cattle to collect the firewood in the mountains. It would be bad but there would be no other option.

Follow-up interview Q7

Ranking

1. Money from husband
2. Social Grant
3. Homegarden
4. Job
5. FR outside plantation
6. FR plantation
7. Livestock

Money is very important, can't live without it! Husband is in Durban, working for SCC

Road maintainance

Without resources, she won't get firewood, poles, she will suffer because she will go to town to buy them. Says she won't have enough money because firewood is expensive.

It is expensive outside the plantation, the transport increases the price because she is close to the plantation. If she didn't have social grant and money from her husband, she would put livestock at the top of the list and also sell crops.

Summary

- She collects gum tree from the platation
- The plantation has value because it prevent floods
- She doesn't know anyone who suffered from crime.
- In the past the plantation looked good and the fence prevented animals to get inside. People could not get much firewood because of security, they had to buy the wood. There was only one security guy hired to her knowledge (unsure).
- No payment of plantation use now. She prefers current management because you can collect firewood for free. Now people cut many trees and there are pressure on the trees. She wishes the older trees should all be cut down and they put new trees again.
- If a private company managed the plantation, the money will belong to the company and used to plant trees and create jobs for the community. There should be a confirmation letter so people can get inside to collect firewood. People should always be allowed inside for free, even though it will be a private company there should still be rules. It is possible for them to make them in the community. Private company should start with community and ask them the rules, then impose the rules. Profits split 50/50.

Follow-up with PPM3

Ranking

1) Social Grant	unemployed, depends on it (560 Rand / month)
2) Livestock	sells pigs & chicken
3) Homegarden	sells
4) Jobs (hired by someone)	
5) Forest Products Plantation	
6) Private business	sells traditional dresses & school clothes
7) Money from relatives	
8) Forest Products outside	
9) Pension	1200 Rand / month (belongs to mother)

- She feels safe using the plantation and has not heard of any crime inside.
- In the past they were paying for the plantation but now they are not. The management was better then.
- If the plantation was fenced she would suffer because she depends on it. Her alternative would be to look for other types of jobs.
- She does not feel safe to be inside alone.
- The benefit of a private company would be safety because people are kidnapped inside. She has heard of someone who was kidnapped long time ago. She would go more often if there was no crime and wishes for more security and a fence..

Key-informant interviews:

Overview of main objectives of key. Informant interviews:

- *Elder plantation user:* To gain more knowledge about the use, access and history of the plantation before the questionnaires were finalized.
- *Bee-keeper:* To understand the special conditions regarding bee-keeping in the plantation
- *Ward counselor:* To assess the future plans for the plantation and the power structures in the village
- *Headman:* To understand the official access rights and the future use of the plantation
- *Sub-headman:* To understand the official access rights and the future use of the plantation
- *Community police:* To address the level of crime in the plantation
- *Carpenter:* To get a business perspective on the use of the plantation
- *Sangoma (traditional healer):* To understand the importance of traditional plants in and outside the plantation.

Bee keeper interview

He established the project in 2005 after reading the content about beekeeping in the magazine called Farmers weekly and trained in East London in 2007 by the help of agricultural office in Maluti. 16 hives inside the plantation, 2 hives in the home garden and some in Queens mesi. Standard of living in his village and the country at large is the main reason for starting the beekeeping. He produces honey and wax. In addition, he has a plan to produce propolis(used for making perfumes and also for hair dressing) in the future .He harvests 25 litres of honey per hive which is about 600-650 rand once a year using traditional method of harvesting .

Security problem because it is not fenced well, cutting down the trees around the hives, deliberate burning of the plantation ,Insect problem (wax moth), Nepotism- top administration are reluctant , being un supportive of the ward councillor are some of the obstacles according to the beekeeper. To make it big project which helps to benefit the community and the country at large, to create employment opportunity, to join the organization called Eastern cape honey producers association in the long term plan, to expand in a new place and to plant flowers around the hives and to move it from a project to a business are the future plans of the beekeeper.

Ward councillor interview

He is the leader of the community, ward councillor of ward 13, and he had the position since 2006 for the one term of each 5 years. His job is to look for the needs of the people and other challenges, to get projects so as to increase employment, to design programs and call for community meetings. Traditional chiefs look out for law and order and take care of problems and he works with him in collaboration even if “Sometimes there are challenges”.

According to him “The plantation belongs to the authority of the chief. It is a challenge to me.” When people pay for the use you have to make an annual report of the income and usage. That is why changes were made. There is no management at all, everyone can go there. He also Said that In the past it was managed much better but now it is bad. A private company will come even if it takes 7 years before it is okay. They will train people to take care of the plantation. We must set a committee of local people to look after the plantation and manage it. People should work there and get paid. After 7 years the plantation should be a product which can be sold to a manufacturer. The company will take part of the share until the community is sustainable (Sappi). These are the future scenario according to him.

He also added that “If we can manage the plantation the future is bright”. People will not be allowed to collect firewood after the project is initiated and It will be a business and there must be a procedure. People could get their fencing poles from shop in town. If the management of the plantation is done by Sappi then people should be allowed to collect

fencing poles etc. Without losing profit. The committee should be in place. Negotiations have already started and we will have a meeting e.g. with the department of agricultural development, chief etc. These stakeholders should meet and discuss. Then after," we will go to Sappi because SAPPI is ready any time." He also said that they will identify 3-4 sites more than 100 hectares each and the land cape program of Department of Agriculture will assist with areas of erosion.

Head man interview

He is a head man of the village under the administration of the chief. He remembered that the plantation was planted into plots very long time ago and ware houses were in the deforested area. The reason for clearing in the middle is from when people lived inside the plantation.

According to him nobody is taking care of the plantation and it became a place of crime activities because it is not fenced. The future fate of the plantation is not reached final decision but he thought it might be better if plank trees are planted. Long time ago it was managed well. People ask for permission letter from the head man and they show to the individuals who live inside and take care of the plantation. "In the Tranki regime, the management was very tight but with the emergence of democracy in 1994, People started to cut down the fences."

He also need to see police station and "It will be better if a business would be put there – maybe farming fruits" and he believes that the community should decide about the future of the plantation. He also added that the decision on the emergence of private companies will come from the chief." If the chief says no, there's nothing that can be done." He thinks that the idea of companies is good idea but Chief hasn't said anything. "If a company wants to invest in the area they come to the headman, together with the ward councillor and they bring it to the chief."

Sub-head man interview

He is the Sub-head man of Thotaneng subvillage , a place where the plantation found . This is his 3rd year in position which is hereditary position but he is standing in for his father. Taking the community cases, judging those that have made mistakes or taking them to the headman are his main responsibilities.

According to him, Everybody is doing everything in the plantation at the moment." Everybody from anywhere can do anything with that". People used to pay, maybe 15 years back and the case about future of the plantation is still at the top level.

He also added that people use the plantation mostly for firewood. “when democracy came, everybody was fighting to take power”. We were selling at that time, from the beginning was just done by the community. He believes that the plantation can be used to produce paper and stop erosion.

“There is no management system at all and we are looking for some company to use of the plantation and get managed.”

He believes that the emergence of companies will benefit by hiring people and
Corruption in different levels is the main obstacle.

Traditional healer interview

He is a member of South Africa Herbal Doctors Association and he has a certificate. He collects medicines from mountains in Matachille because he does not find what he wants from the plantation and nearby mountains. He buys fire wood from someone else and also collects from the plantation and mountains. He does not collect other products from the plantation. He collects anytime, that is, when needed. He believes he can use the mountains as alternative source for wood products.

He said that the plantation was fenced long time ago and were asking permission to collect from it but anyone can collect as he wishes. “Pakisi is the individual who receives money and take care of the plantation long time ago and he was government employee”. He believes that the past management system was good than the current one because no one is responsible for the plantation. He also has good attitude to the companies that may come in the future as long as they come with good idea and prefers to be planted again with new ones because the current one is not much valuable to the society. He thinks that the individual or company who comes in the future will plant plank tree and he guess that it will be the government. And he believes that it is a good idea but if it is practical only.

Community policing interview

He is a member of the community policing forum of the village. He believes that the plantation is serving as the place of crime activities such as killing and raping children and affects the plantation use by the local people .He also said that crimes happened every month and he thinks that “Rawhang” should be responsible for preventing crime, it deals with preventing cattle from being stolen. They have first position in the village when it comes to preventing crime. The victims of the crimes are females from the ages of 11-12, it can even be grandmothers of age 70-80.

According to him, most crimes occur at Night (including general crimes in the village) and 12 o´ clock(noon),when people go there to collect the firewood. He mentioned also that “There is a new government, so people know they are not going to be punished very harshly. Before

would be harsh punishment by community (e.g. beating) but they would make sure this person deserved it." Moving all around at night is the means of preventing the crimes and he wishes that our research can go to the government so the issue can be solved. And they have to contact the government to ask for help to solve this issue.

Carpenter interview

He is a carpenter and has 3 individuals in his house hold. He uses poles from the market (Matachille) and sometimes from the plantation for roofing and building . He said that people prefer poles from Matachille due the quality aspect. He uses pine tree poles because of good quality. He collects for fire wood, fencing (wattle), building materials by hiring tractors (full tractor). He collects fire wood 2-3 times a week and also from the mountains.

He earns money depending on the size of the house to be built. He needs permission from the sub head man but do not pay for collecting and also makes wood furniture for himself. He also collects medicinal plants and feels safe in using the plantation but he fears snakes.

Sangoma interview

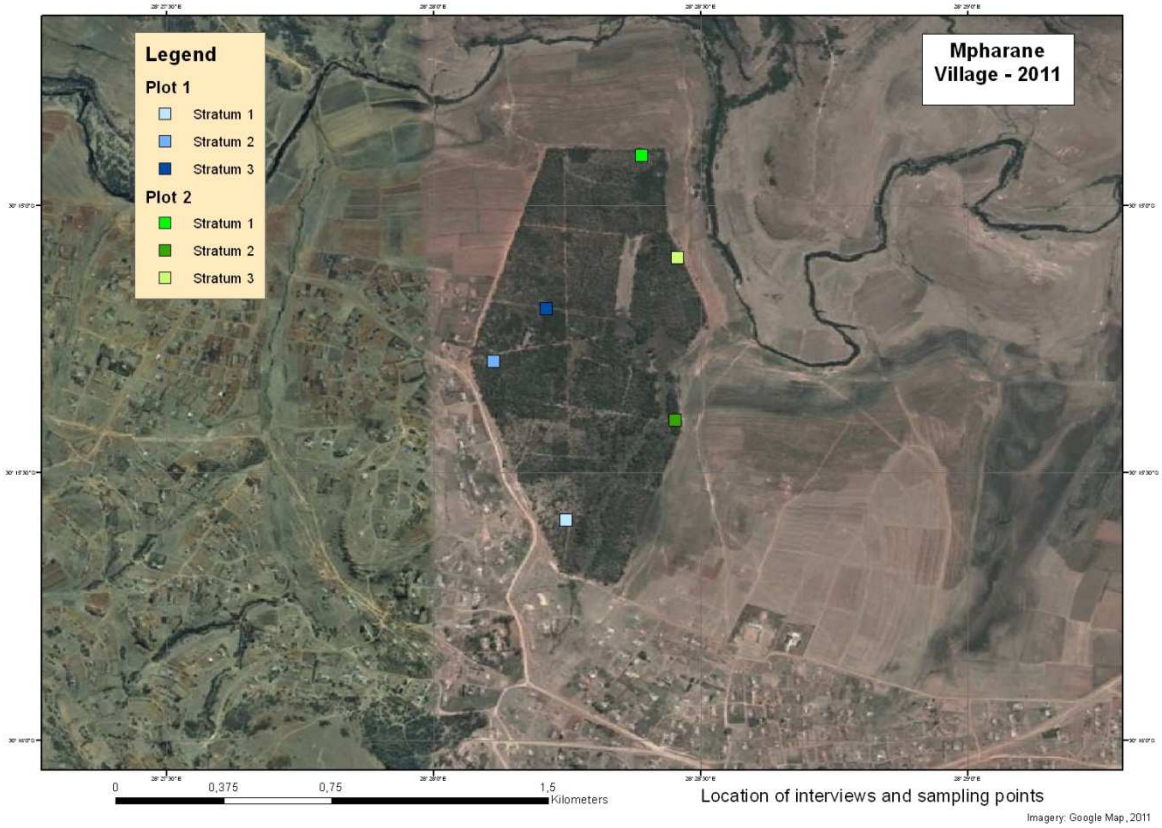
If you go back to eating traditional food people will have better well being. To prevent people getting sick, go back to the traditions. Before, we used to respect each other.

Sweet potato, improves everything and cleans the blood, these plants improve well being.

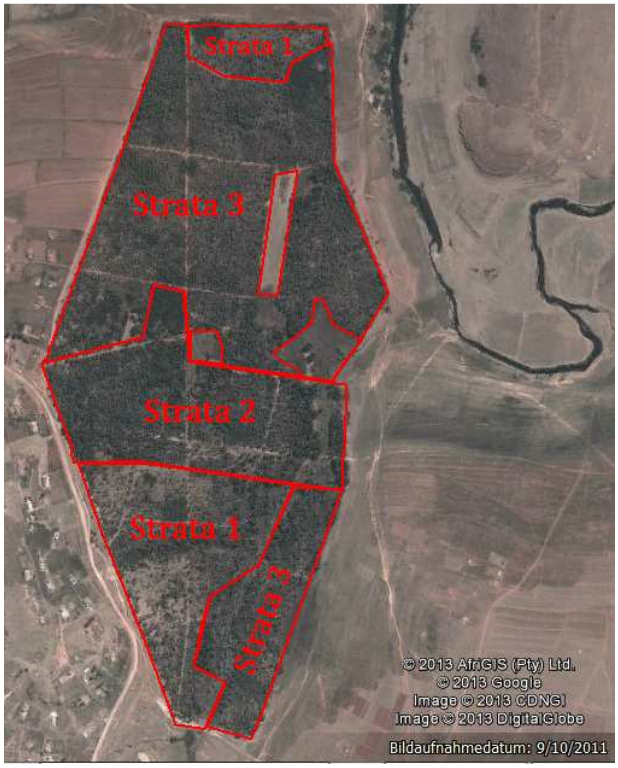
In the plantation, the medicines are important, they make people survive. Gumtrees provides many products such as roofing, chairs, paper. The important traditional aspect of trees is firewood, which we use for ceremonies (wattle). Plants in the mountain are curing people and helping them when they are sick. The plants in the plantation and the mountain are the same, but in the mountains there are much more than in the plantation. There are not enough traditional plants close to the village, some are not even growing in this area. I would like more because it is expensive to go to Durban to get the plants. Cattle which walks on the plants are a threat to traditional medicines. You plant the plants away from the wattle. Because there is no open space, I am afraid to go to the plantation. I would like to have it removed. People can buy plantation products in the town. People are scared of the plantation, especially women. Trees from other countries are most important. The gumtree is very important for building, even if there are too many.

Appendix II – Plantation Strata and Position of the Plots

Position of the Plots:



Plantation Strata:



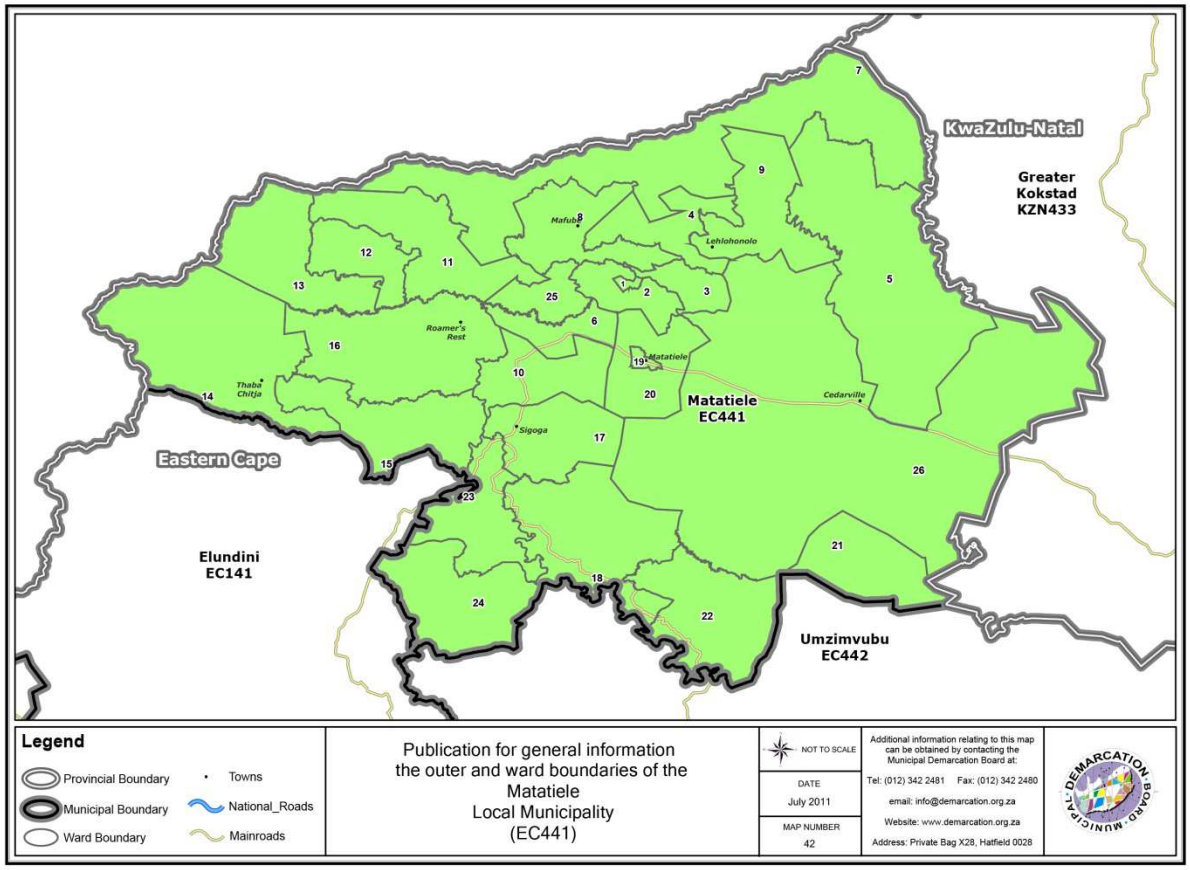
Source: Google Earth Pro

Plantation Part	Density	Area (in km^2)
Strata 1	Scattered	0,15
Strata 2	Dense	0,15
Strata 3	Average	0,37
Total Area	**-**	**0,67**

(Area calculated with Google Earth Pro)

Appendix III –Ward 13 Map

Ward 13 Map



Source: TBT

Appendix IV – IDP Report – Summary

IDP (2011) Integrated Development Plan

Confirmed community Ward based Priorities, 2011/2012 (summarized for Ward 13)

Mpharane and locality	Whole ward	No location (i.e. somewhere within Ward 13)	Not included (though included in other Wards)
New provisions to improve poor water quality New access roads Maintenance and new bridges (Mapoleseng) Telephone network poles (Ramaquele) New pre-schools School (Mpharane) Orphanage and old age centre (Mpharane) Thotaneng Plantation Rehabilitation Programme Green revolution (youth project)	Maintainance of tank/ yard connection water Electrification Clinic – no ARVs Public transport for scholars Disaster management Rural housing Dip tanks	Multi-purpose sports field Multi-purpose library Environmental Fencing of fields Satellite police station (hand written) Massive food production (hand written) Skills development	Access road maintainance Sanitation Community service Pre-school renovation Satellite paypoint Job creation

Appendix V – Calculations of Firewood Collection Values

To find out comparable results, a scale with the average purchasing price for each type of firewood collection was created, using information from questionnaires and interviews.To do this it is necessary to differentiate between certain types of firewood collection (headload, wheelbarrel, cattleload and tractorload), which is related to the mass, as well as distinguishing the frequency of collecting. Thereby the collection values can be determined by multiplying the collecting type and the corresponding average purchase price.

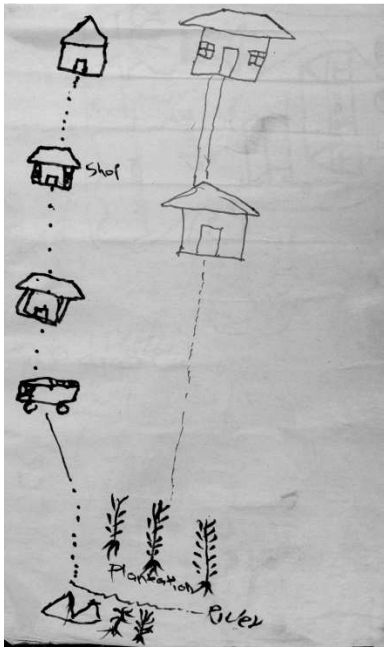
Unity values

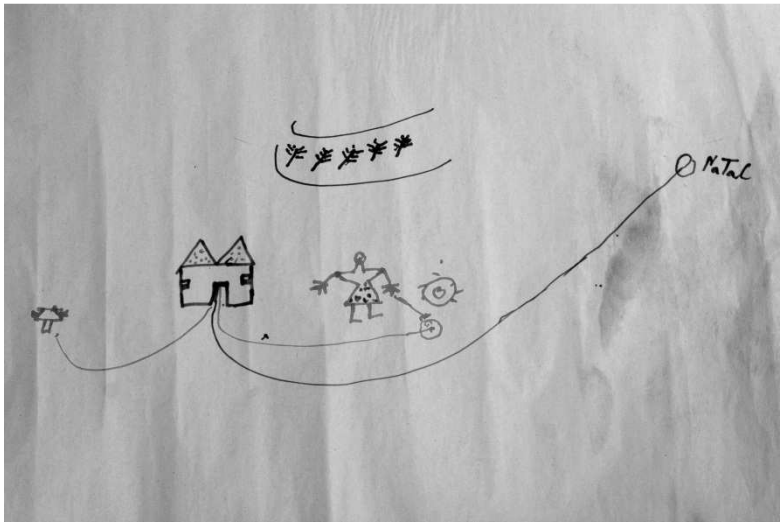
Unity	Average Purchase Price (in Rand)
Headload/Bundle (”Ngata”)	13
Wheelbarrel	45
Cattleload (”Frak/Bungle”)	350
Tractorload	825

Since the households have a different amount of people, the accumulated value of the collected firewood per year for a household was divided by the members of each household (next page).

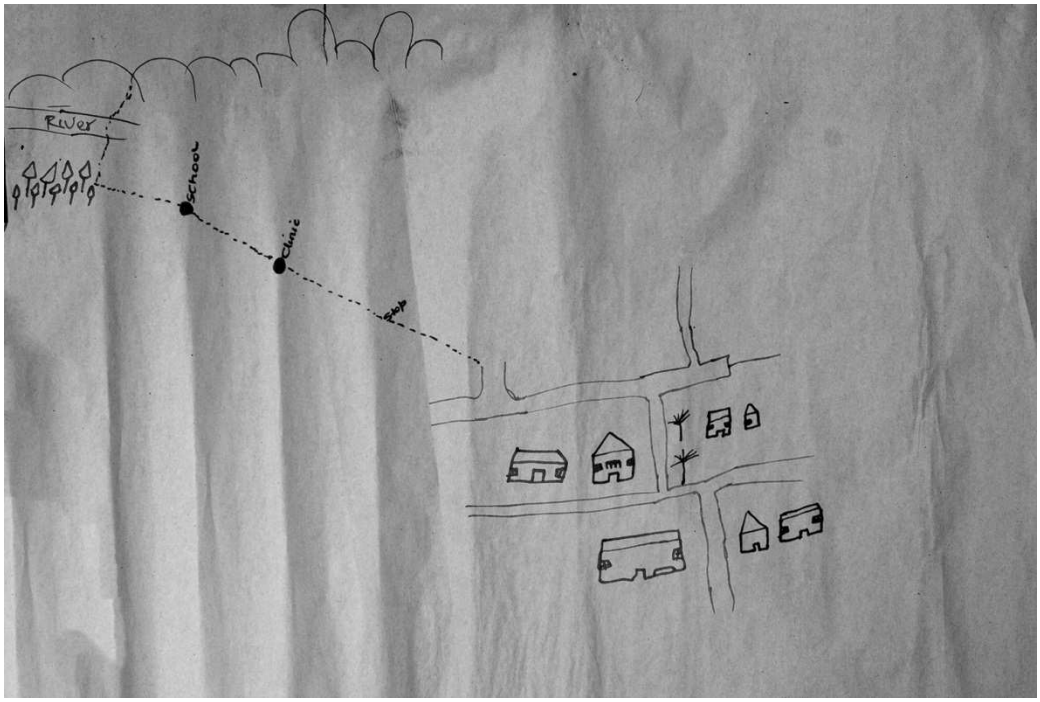
Excel Calculations:

Appendix VI – Participatory Mapping Exercise





PPM1 (left), PPM2 (up), PPM3 (down)



PPM 1, Poor HHs (2 individuals, x and y)

There were two participants in this participatory mapping. Both of them lives traditional way of living .One of them collects from the plantation twice a day and once a day from the mountains. The other collects from the plantation once a week for fencing poles and 3 times a week for fire wood. They collect black blue gum and pine poles from the

plantation. We give them a map to illustrate where they collect and both of them collects from the northern part of the plantation because wood is stronger in the northern part of the plantation. One of them collect medicinal plants from both the plantation and mountains and one of them collects only from plantation.

Both of them feels good if the plantation is fenced, and they will use mountains as alternative sources. Both of them said that children collect berries and peaches and used products for self consumption. One of them wishes that" the plantation would be cleaned for unwanted trees, which could create job opportunities."

Participatory mapping two

The participant is a traditional Healer. It is a natural gift to be traditional doctor. She is afraid (to go in the plantation) people have been kidnapped or killed. She feels safe to go by the river as each and everybody can see her (there). She collects medicinal plants from the mountains once a month and she sometimes buy from Durban. She used to hire a tractor for fire wood collection. She also used to make a traditional alcohol from Sorghum and collect boys to go and collect firewood.
She goes to town to buy the planks for house and fencing from the plantation, because she no money. She collects poles for roofing from the plantation and sometimes from market. She also collects poles for fencing from the plantation. She said that she may use the mountains and also buying from market as alternative sources.

Participatory mapping three

There were 3 participants in this participatory mapping. Two of them were unemployed. One of them collects firewood from the plantation, sometimes goes to the road, and assists those maintaining the road for money and takes care of a pig. They are suffering financially, they depend on the plantation, they go there each and every day and Fencing poles – 2 times per year.
They collect Medicinal plants from the mountain and little mountain and they collect gum tree leaves from the plantation. They also said that they will use Wattles from mountains as alternative source. One of them sells sometimes firewood, 13 rand per bundle. "Ngata = bundle of firewood in Sosotho". She sells the firewood whenever she doesn't have money for candles, approximately 5xper month.
They said the plantation could be used as a game reserve, put a fence around or for farming, but it is better to keep the plantation, because it is closer and females can go there by themselves.

Appendix VII – Forest resource assessment measurements

In the forest resource assessment the following parameters were calculated:

Diameter: The diameter of standing trees was taken at 1.3 m or 4.5ft above ground level which is referred to as breast height diameter (dbh) (Husch et al, 2003). Diameter (DBH) of trees which are > 5cm in diameter in each stratum was measured and recorded using diameter tape for each species.

Height: Height of sample trees in each stratum was measured and recorded using clinometers from different distances depending on the height of the trees (Husch et al, 2003, p. 101) for each species. However, the height of the remaining sample trees was predicted using the height model. Afterwards, the following parameters were calculated and analyzed.

Basal area: *"If the cross section of a tree is taken at breast height, it is called the basal area*" (Husch et al, 2003, p.94). Since basal area has the potential to indicate the stand volume and density of a given plantation (Husch et al, 2003), cross sectional area or basal area of each tree, stratum and the whole plantation were calculated using the standard formula ($3.14*(DBH)^2 /4$) and analyzed.

Volume: "*Diameter, height, and form are the independent variables that are commonly used to determine the values of the dependent variable-tree volume"* (Husch et al, 2003, p. 136).The volume of each sampled tree in particular and the whole plantation in general was calculated using the standard formula ($V= f_r*g_{1.3}*h$) based on the information obtained from the height and diameter measurements of the trees and analyzed (Husch et al, 2003,).

Appendix VIII – Traditional Plants

Out of over 20 plant names noted in Sesotho, we have been able to translate 5 into Xhosa and then find them in Trevor's plant dictionary. These will be the ones most widely found throughout South Africa.

Sesotho	Xhosa	Scientific name	Family	Common name	Uses/notes
Monnamotsko	Umbhongisa	*Diospyros villosa*	Ebenaceae	Hairy star apple	Bush, making sticks
Lesoquo	Iqwili/ikhathazo	*Alepidea amatymbica*	Apiaceae	Giant alepida	From mountains
Labatheka		*(Hypoxis hemerocallidea)*		African potato	
Papliers	Umthombothi	*Spirostachys africana*	Euphorbiaceae	Tambotie	
Pohotshehla	Ishongwe	*Pachycarpus concolor*	Asclepiadaceae	Astral pachycarpus	

References

Dictionary of popularly traded plants in South Africa, Nicci Diederichs, 2001. Institute of Natural Resources, Department of Arts, Culture, Science and Technology. Innovation fund project.

Appendix IX – GPS Tracking

Day one , visit to plantation and random places , 01-03-2013

Way points	Location	Remark
1	Shaley	
2	King´s forest	
3	Community hall	
4	King´s house	
5	Plantation	
6	Southerastern entrance	
7	Eastern entrance	
8	Bee keeper´s house	
9	Bee- hives	

Day -2 , partcipatroy mapping ,02-03-2013

Way point	location	remark
10	Phomolo´s house	Poor H.H
11	Emmanuel´s house	Poor HH
12	Elzabeth´s house	Tradtional healer
13	clinic	
14	Beauty´s house	Poor HH

Day 4 , Questionnaries,, 04-02-2013

Way point	location	remark
15	Reaoboka´house	HH 1
16	Mantasu´ house	HH 2
17	Lillo´s house	HH 3
18	Katleho´s house	HH 4
19	Matskugenet´s house	HH 5
20	Grace´s house	HH 6
21	Malebese´s house	HH 7
22	Fulumane´s house	HH 8
23	Nothlanitenene´s house	HH 9

Day 5 , Questinnaries , 05-03-2013 (far places)

Way point	location	Remark
25	Mothiebli´s house	HH 1
26	Paskalina´s house	HH 2
27	Matenza´s house	HH 3
28	Beauty´s house	HH 4
29	Anstia´s house	HH 5
30	Madikotsi´ house	HH 6
31	Grace´s house	HH 7
32	Alena´s house	HH 8
33	Victoria´s house	HH 9
34	Gugushe´s house	HH 10

Appendix X – Final Synopsis

Mpharane Plantation – Access rights, the effect on people´s livelihoods and future benefits

Project Synopsis - SLUSE field course 2013

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Submission date: February 22nd, 2013

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Introduction

In resource-poor rural communities of South Africa, natural resources play an important role in the available livelihood strategies. The availability of natural resources such as forest products can serve as a safety net in order for households to cope with vulnerabilities and shocks such as draughts, heavy rainfall, land use changes and socioeconomic changes (Reid and Vogel, 2006). The use of forest resources provide three main benefits to households; supply of basic needs, saving of cash resources, buffer or safetynet during time of misfortune (Shackleton, 2004). The availability of natural resources is to a large extend determined by the access rights and management of the resource. The historical legacy of the post-Apartheid system has had many impacts on the livelihoods of the rural population in South Africa amongst one of them is changes in governance structures and access rights (Agergaard and Birch-Thomsen, 2006). In our research we will explore the opportunities and constraints for utilizing assets from a plantation located on the outskirts of the village Mpharane in South Africa.

Access is defined as the *"freedom or ability to obtain or make use of*" something (Ribot, 1998, p. 310) and the *"the ability to benefit from things*" (Ribot and Peluso, 2003, p. 153). To analyse the characteristics of people´s behaviour relating to common pool resources (CPR) such as plantations, it is important to obtain information and define the access rights to these resources. In other words, who is in charge of the resource and what are people´s rights and de facto uses. Land rights in South Africa were traditionally organized through chiefdoms, in politically autonomous groups (Bennet et al., 2012). Colonialization brought state control, which supported traditional structures in an increasingly authoritarian and decentralized manner through the apartheid eras. Following the abolishment of apartheid, much of this state apparatus was removed in former homeland areas, leaving the status of land tenure and management arrangements unclear. In 1994, Transitional Rural councils (TRCs) were set up as democratically elected and locally accountable bodies (Bennet et al., 2012). However, in 2000 these were incorporated under local municipalities, before many of the most contentious issues could be resolved. Legislation relating to CPRs is currently ambiguous. The Communal Property Act (1996) assists the progress of local resource management by enabling the creation of communal property associations (CPA). However, traditional authorities were able to successfully resist attempts to devolve their power over land access and control through apartheid laws governing land allocation, which were still valid. The Communal Land Rights Act (CLARA, 2004) aimed to decentralize power thorough land administration committees, which were intended to be either democratically elected or traditional councils, as decided by the community in question. This is currently being reconsidered following contestation in the constitutional court by land activists. Simultaneously, the Traditional Leadership and Governance Framework Act (TLGFA, 2003) reinforces the power of traditional authorities. These have an increasingly important role and overall control over communal areas remains highly contentious. This historical and legal background will form the context of our investigation of the Mpharane plantation.

Our research area is a plantation, based in Mpharane, a part of the Alfred Nzo district in the Eastern Cape province of South Africa. The Alfred Nzo district, which borders Lesotho, has an estimated population of 544.000 people and 82.3 percent of the population lives below the poverty line (defined as an income of less than 800 Rand per month (Province of the Easter Cape, NA). Plantations in South Africa cover approximately 0,5 % of the total landmass, industrial use constitute 7,3 % of national GDP (2002) but some plantations allow use of non-forest timber products (NTFP) such as berries, honey and firewood (Shackleton et al., 2007). From verbal sources we have been informed that the plantation in Mpharane has an open access system, which allows villagers to extract benefits from the forest. Until 1994, during the Apartheid, the plantation was managed by the South African forest department. From satellite images the area of the plantation adds up to one square kilometer and it comprises, amongst others, eucalyptus trees, pines and wattle. There is no empirical data about the benefits extracted from the plantation, but through a verbal source we have been informed that there is honey production and collection of non-timer forest products. Therefore the main objectives of this research are about finding out the plantation access rights and the value to people´s livelihoods.

Problem statement

For our research we have identified the following problem statement:

What are the access rights to the plantation in Mpharane, and how do they affect people's current and future livelihoods and opportunities for further benefits?

The main objectives of our study are:

- To understand the access rights to the plantation in Mpharane - how they are enforced and by whom.
- To assess how the current use of the plantation affects the livelihoods of the inhabitants in Mpharane.
- To discover the opportunities and constraints to increase the benefits of the plantation.

These objectives have generated five interconnected research questions:

- *Which resources are available to the villagers in the plantation?*
- *What are the access rights to the plantation and what is de facto?*
- *Who are the users of the plantation resources?*
- *Which impact does the use of the plantation resources have on the user's livelihood?*
- *What are the opportunities and constraints for future benefits of the Plantation resources?*

Project description

With the above research questions in mind we have designed our research approach. In the first part of this section we will introduce this overall approach to the project,

including an overview of the identified data which will be needed to answer each of our five research questions. In the second part we will elaborate and reflect on the selection of methods which will be applied to collect the identified data.

Identification of data

As an analytical framework to identify our research questions we have used the Sustainable Livelihood (SL) Framework (DFID, 1999). The SL framework is a tool to improve and understand the livelihoods of people and their room for manouvre within their current startegy and contecxt. In our project we use the framework to assess the imporatance of the plantation resources to the users of the forest resource. Each of our research questions relate to one of more of the elements of the framework, see figure 1.

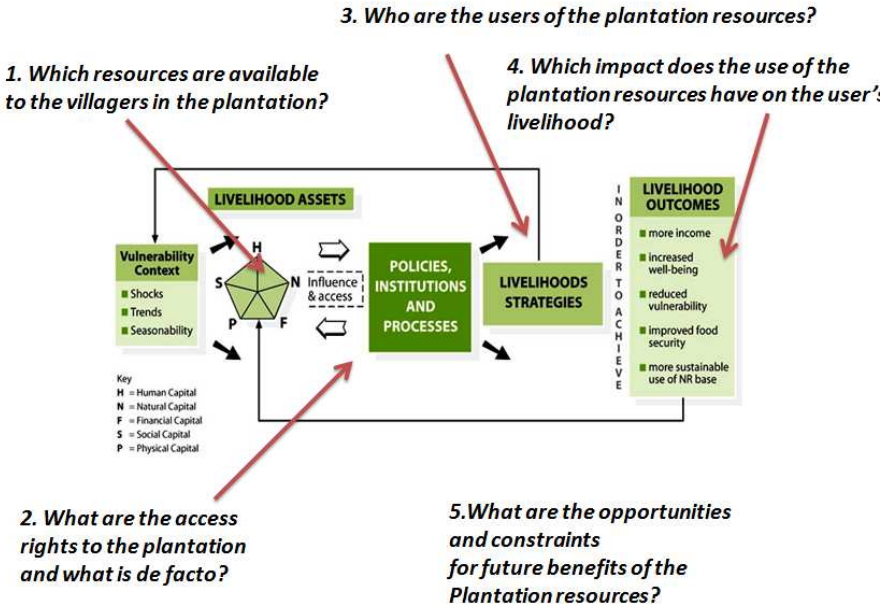

Figure 1. The connection between our research questions and the SL framework (moderated from DFID, 1999)

Research question 1-4 addresses specific elements of the framework while question number five seeks to assess which elements in the whole framework could be improved in order to improve benefits from the forest resource.

In order to answer the defined research questions, we have identified needed data for each of the five questions and the reasoning for the selection will be defined in the following. A schematic form can be found in Appendix I.

Which resources are available to the villagers in the plantation?

Our primary objective of the project is not to quantify and qualify the natural resource in the plantation; rather our emphasis is on the use of the resource and how this use has an impact on the population in Mpharane. However it is highly relevant to get an overview of the different resources available in the plantation. These resources could be translated into activities or products such as collection of firewood, beekeeping and

other NTFPs, recreation or religious activities (Shackleton et al. 2007). To get an overview of these resources we will:

- Make a brief assessment of the biodiversity in the plantation
- Identify the types and quantity of NTFPs
- Discover if major changes has occurred in the forest resource since the shift in management from 1994.

What are the access rights to the plantation and what is de facto?

From a user perspective it is of crucial importance for us to discover the access rights to the plantation, to assess whether the access rights have any impact on the use of the plantation. This understanding should assist us in our analysis of who the current users are and why, but as outlined in the introduction access rights is a complex topic (Ribot and Peluso, 2003). To understand the access rights to the plantation we will:

- Identify the ownership and current management system
- Assess how the access rights are communicated and enforced
- Identify relevant decision-making institutions
- Understand the major historical changes in the access rights since the end of Apartheid in 1994.

Who are the users of the plantation resources?

Very much linked to the question of access rights is the question of who the actual users of the plantation are. We will need to collect a representative sample of household from Mpharane in order to assess the level of usage. To identify the users of the plantation we will:

- Identify and mark which households are users and which are not.
- Discover if there are any factors affecting who these users are such as distance to the plantation or socioeconomic status

Which impact does the use of the plantation resources have on the user's livelihood?

This research question is about establishing the relevance of the plantation in relation to the livelihood of the population in Mpharane. In this assessment we can use selected parts of the livelihood framework (DFID, 1999). To understand the impact on the livelihood of the population we will:

- Understand the different uses of the plantation resources in the different households
- Which type of benefits do the users extract from the plantation (monetary, religious, nutritious)
- Identify other different income generating activities in the households

What are the opportunities and constraints for future benefits of the plantation resources?

In the first four research questions we try to establish the current system of access, management and usage. With the last research question we wish to discover the potential for further benefits, the local desire for such benefits and identify which constraints there may be in this process. To assess the future scenarios we will:

- Explore the wishes and ideas of the population in relation to the usage
- Identify existing ideas initiatives such as Sappi (reference)

Applied methods

The identified data will be collected through a broad scale of different methods. The timeline in Appendix II gives an indication of how the methods will be implemented in the duration of the research. Our data will mainly consist of qualitative data since our applied primary methods are Participatory Rural Appraisals (PRA) and semi-structured interviews. The different data collected is both exploratory and explanatory and will be analysed according to the applied method but will also be interconnected in the process of triangulation, which is assessing the same data from different perspectives (Jick, 1979). This process could be of particular importance when assessing the access rights and usage of the plantation. The data will be analysed in depth after the fieldwork has been completed, but many of the methods are dependent on the outputs of previous methods and thus the data will be used ongoing to modify and shape the research in the field.

In the following each of the methods are shortly described.

Observations

Observations of the available resources, structures and livelihoods are an important source of information. In order to observe and get an initial impression of the plantation a transect walk will be conducted in the beginning of the fieldwork with the translator as guide. The main objective of the walk is to assess the biodiversity and availability of NTFPs while identifying strata for the following forest assessments which will be marked with GPS (Schoonmaker F., p. 82). A similar initial observation walk will take place in the village, to create an understanding of the number of households, general living conditions etc. Furthermore, this is may create an opportunity to speak with the local people and to identify key-informants, and find peoples interested to participate in the overall data gathering.

Questionnaires

A short and simple questionnaire will be conducted with the aim of quantifying the users and non-users of the plantation and the main purpose of usage (GAO, 1993). The questionnaire can be found in Appendix III. The sampling of the participants will be based on two elements: the distance of the household from the plantation and the socioeconomic status. The socioeconomic status will be defined by comparing pre-defined criteria of wealth (conducted in a PRA wealth ranking exercise by all participating groups) with the observations made in and around the household. Each household will be mapped with a GPS.

Key informant interview

"A key informant interview is a loosely structured conversation with people who have specialized knowledge about the topic you wish to understand" (NECAPT, 2004, p.1). Key informant interviews provide opportunities for examining specialized systems or

processes, which in our case is relevant for assessing access rights and specific usage of the plantation such as the beekeepers. Identifying these key informants will be done together with our translator.

Semi-structured ***interview***

Semi structured will be conducted at different stages in the research process. Initially the interviews will be conducted with a few households selected through a snowballing process from our translator with aim of expanding our knowledge about the use of the plantation, leading to a modification of our questionnaires. The information we seek is the household utilization of the forest resources, the value of the plantation to the household, other income generating activities, awareness of the people in management an access rights of the forest. A guideline for the semi-structured interviews can be found in Appendix V.

Participatory Rural Appraisal (PRA) - participatory mapping and ranking

PRA is a collection of methods, which enable rural populations to share and assess their knowledge about elements of their life conditions. Opposed to a questionnaire, the PRA process and outcome is to a large extent shaped by the participants themselves. The three main pillars of PRA are:

- Behavior and attitudes
- Methods
- Sharing.

Essentially the key to a good PRA process is to have relevant and active participants collaborating within a well defined framework. In our research we will apply several different PRA methods such as participatory mapping of the plantation resources, mapping of institutions and possible future workshops. Each of these is described in more detail in Appendix IIII.

Forest assessment

To be able to make any suggestions for future benefits of the plantation we need to make a basic assessment of the natural resources of the plantation. First we will look at the aerial satellite photos and then we will identify specific areas of interest in which sampling will be undertaken. Stratified random sampling technique will be used as a sampling method to get representative samples of the plantation since the plantation stand is not homogenous as it is shown in the aerial satellite photo (Freese, 1976). We will have different strata within the plantation selected based on field observation of homogeneity all over the plantation in which a plot of $400m^2$ will be taken from each stratum. Measurements will be taken from each stratum and will be analyzed independently to assess and estimate the parameters listed in Appendix VI.

References

Agergaard, J. & Birch-Thomsen (2006): Traditional rural landscapes: The role of small scale commercial farming in former homelands of the Post-Apartheid KwaZulu-Natal. In: Geografisk Tidsskrift, Danish Journal of Geography, 106 (2).

Bennett, J; Ainslie, A. and Davis, J. (2013): Contested institutions? Traditional leaders and land access and control in communal areas of Eastern Cape Province, South Africa In: Land Use Policy 32, 27-38

DFID (1999): Sustainable livelihood guidance sheets. Chapter 2.1.-2.6.

Freese, F. (1976): *Elementary Forest Sampling*, Agricultural Hand Book No. 232. US Department of Agriculture, Forest Service.

GAO (1993): Developing and Using Questionnaires. USA.

Husch, B., Beers, T. W. & Kershaw J. A. (2003): Jr.2003. *Forest Measuring*, 4th Edition. John Wiley & Sons, Inc., Hoboken, New Jersey.

Jick, TD 1979, 'Mixing qualitative and quantitative methods: Triangulation in action', *Administrative science quarterly*, vol. 24, no. 4, pp. 602-11.

Kaner, S., Lind, L., Toldi, C., Fisk, S., & Berger, D. (1996): Facilitator's guide to participatory decision-making. New Society Publishers, Canada. Introduction, pp. XII-XVI, and chapters 1-3, pp. 3-37.

Mikkelsen, B. (1995): Methods for Development Work and Research – A new Guide for Practitioners. Sage fourth edition, New Delhi. Chapter 3

NECAPT (2004): Key Informant Interviews. Accessed 15.02.2013. <http://www.oasas.ny.gov/prevention/needs/documents/KeyInformantInterviews.pdf>

Reid, P. and Vogel, C. (2006): Living and responding to multiple stressors in South Africa—Glimpses from KwaZulu-Natal. In: Global Environmental Change 16 (2006), 195

Ribot & Peluso (2003): A Theory of Access.

Ribot (1998): Theorizing Access: Forest Profits along Senegal´s Charcoal Commodity Chain.

MS/ActionAid Denmark (2010): Empowerment Guide. Internal workshop material.

Schoonmaker Freudenberger (n/a): Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) - A Manual for CRS Field Workers and Partners.

Accessed 15.02.2012.
http://www.crsprogramquality.org/storage/pubs/me/RRAPRA.pdf

Shackelton, C. (2004): Assessment of the livlihoods - Importance of forestry, forests and forest products in South Africa.

Shackleton, C. M.; Shackleton, S. E.; Buiten, E.; Bird, N. (2007): The importance of dry woodlands and forests in rural livelihoods and poverty alleviation in South Africa.

Steward, David W.; Shamdasan, Prem N.; Rook, Dennis W. (2007): Focus Groups – Theory and Practice.

Website: Province of the Easter Cape (14/2-2013): Province of the Easter Cape – Social Development & Special Programmes (2013): Background Information about Alfred NzoDistrict. Accessed 14.02.2013.
<http://www.socdev.ecprov.gov.za/districts/AlfredNzo/AboutUS/Pages/BackgroundandOverview.aspx>

Synopsis - Appendix I – Data Matrix

Research question	Data required	Methods	Materials
Which resources are available to the villagers in the plantation?	-Estimation of biodiversity (tree species, density, quantity and quality) -Availability of non-timer forest products -Map of the plantation	-Observations -Measurements -Participatory mapping of the plantation -Analysis of satellite/aerial photos	-Satellite/aerial photos -Large paper for mapping, pens
What are the access rights to the plantation and what is de facto?	-Identify ownership -Identify Management system -Identify in decision-making institutions in the village (official/unofficial) -Historical changes in access since 1994 Communication of the access rights Enforcement system	-Key-informer interviews (chief, headman) -Semi-structured interviews with villagers -Focus group discussions towards the end of the stay -Venn diagrams	-Large paper for mapping, pens
Who are the users of the plantation resources?	-Representative sample of diff. HH and their socioeconomic. background -Location of HHs -Identify users -Identify factors which affect the users (distance, socioeconomic background)	-Observations of use -Questionnaire/semi-structured interviews -Mapping of resource -GIS mapping of HH location -Participatory mapping of who the socioeconomic. HH are in the community	-GPS -Large paper for mapping, pens
Which impact does the use of the plantation resources have on the user's livelihood?	-Identify the income generating activities in the HHs -Socioeconomic differences between HH interviewed -Identify the different uses of the	-Participatory mapping of the plantation use -Ranking of the importance of the plantation in their livelihood -Questionnaire -Observation	-Large paper for mapping, pens

	plantation resource		
What are the opportunities and constraints for future benefits of the Plantation resources?	-Peoples wishes for the future -Existing initiatives (Sappi) -Past changes in the resource	-Focus group discussions of future scenarios -Key-informer interviews (chief, headman) -possible future workshop approach/scenario workshops -Interviews with Sappi officials -SWOT analysis	-Large paper for mapping, pens

Synopsis - Appendix II - Timeline

Date	Expected duration	Aim	Method
28th of February	2 hours	Get to know the translator and update him/her on the project	
	2-3 hours	Greet the headman, settle with the host family and explore the village	
1st of March	1-3 hours	Establish an informal overview of the power structures, and general management systems in the village and in regards to the plantation.	Informal conversations (translator, host family, neighbours)
	2 hours	First visit to the plantation with the translator and potentially identified users. Estimate the needed methods for making a forest assessment	Observation, informal conversations
2nd of March	2-3 hours	1. Identify households of relevance to the questionnaires (following days). Factors: the socioeconomic status of the households, forest uses. 2. Identify key-informants for semi-structured interviews (e.g. forest officers, bee keepers)	Participatory mapping
	2 hours	Understand decision-making structures/institutions in the village.	Venn diagram to map power relations
	1-2 hour	Optimize our sampling strategy using information from previous steps	
	1 hour	Test semi-structured interview with translator	
3rd of March	½ day	Further deepen the understand power structure/access rights to the forest	Semi-structured interviews with key-informants
		Develop initial understanding of household benefits/use of the plantation prior to the questionnaire stage	Semi-structured interviews with one HH with each socioeconomic group
	2 hours	Test the questionnaires and adapt	
4th, 5th, 6th of March		1. Get the public understanding of action rights. 2. Identify the users and non-users of the plantation. 3. Identify reasons/factors for the use/non-use. 4. Find participants for the PM in next stage	Questionnaires (30-60 min for each)

Activities happening simultaneously with the questionnaires		1. Assess the plantation resource. 2. Analyse data from interviews, mapping exercises and questionnaires.	Natural Resource Forest Assessment methods
7th of March	2-3 hours	1. Elaborate on the specific use of the plantation resource 2. Visit the plantation with the users	Participatory mapping of the plantation by identified users (e.g. beekeepers)
7th of March	1-2 hours	Explore future plans for the plantation in the pipeline (e.g. Sappi)	Semi-structured interview with key-informant (e.g. chief)
8th of March	2 hours	Explore wishes and ideas for future benefits and use of the plantation resource	Focus group discussion of future scenarios
9th of March	2 hours	Explore wishes and ideas for future benefits and use of the plantation resource	Focus group discussion of future scenarios
		Evaluate, follow up and reflect on the data collected – buffer for last-minute data-collection	
10th of March		Departure	

Synopsis - Appendix III - Questionnaire

1) How many people currently live in your household?
2) Are there currently people living away from your household?
3) Do you or anybody in your household use the plantation? Yes/no (if no, go to question 7)
4) How often do you or anybody from your household use the plantation?
5) Do you collect the following products from the plantation: Timber, poles, berries (list available forest products).
6) Do you use them:
- Sell product in the market (yes/no)
- Sell to another local household (yes/no)
- Barter for another product (yes/no)
- Subsistence (yes/no)

7) Do you collect forest products from other sources?
8) Do you need permission to use the forest? From whom? For which products?
9) Other comments
10) May we contact you again for follow-up interview?

Synopsis - Appendix IV - Participatory Rural Appraisal (PRA) methods

The following sections should be seen as an attempt to define the framework for our PRA methods.

Wealth ranking with all the groups

Aim	Create identifiable and observable indicators of wealth and wellbeing in the village to be used for selections for questionnaires
Theory/framework	-PRA methods (Mikkelsen 1995)
Participants and sampling method	The exercise is conducted together with the other groups. The participants will be the translators and other key informants they may identify
Preparations	Arrange the exercise with the other groups Select and inform participants of an appropriate time and place Brief the translator on the exercise and ensure he understands the aim and flow
Materials	Pens, markers, cards
Time needed	2 hours
Process	1. Explain the purpose of the exercise to the participants and present them with the materials. Inform them that we look for the overall picture of the wellbeing and identifiable (observable) criteria of wellbeing of the village 2. Have the participants discuss and identify criteria and terms for wellbeing in the village and identify the best local words/phrase. 3. Finalize the exercise and thank the participants. Explain to them what the need of the map will be.
Data analysis	The data should be used for selecting participants for the questionnaires and semi-structured interviews. The criteria should be brought to the HH s and used as a checklist to assess the wellbeing of the household.

Participatory mapping of the plantation

Aim	To understand the available resources in the plantation and which benefits they provide to the villagers. The understanding is part of assessing the Natural Capital of the SL framework
Theory/framework	-PRA methods (Mikkelsen 1995) -SL framework (DFID 1999)
Participants and sampling method	Participants will be selected from the household which have participated in the questionnaire and have been identified as regular users of the plantation. They will be invited to attend the mapping at the end of the questionnaire. A group of 4-5 key-users would be preferred.
Preparations	Select and inform participants of an appropriate time and place

	Brief the translator on the exercise and ensure he understands the aim and flow
Materials	Large piece of paper, makers, aerial photo of the plantation
Time needed	1-1,5 hour
Process	4. Explain the purpose of the exercise to the participants and present them with the materials. Inform them that we look for the overall picture of the use/benefits, and not a detailed representation of the plantation 5. Ask them to draw the boundaries/frame of the plantation and the main roads/landmarks on the boundaries. Assess if it is relevant to provide them with the aerial photo to help create the shape. 6. Ask them to plot in areas of interest in the plantation, specific uses, variations in biodiversity, management systems, fences, NTFP use, land use changes etc. If needed, help them select create color categories if needed. Remember to take notes as they discuss. 7. Ask exploring questions about the use/benefits – e.g. seasonality, patterns in the users profile (gender, age, status), access 8. Compare the result with the use/benefits identified from the questionnaires and if needed ask elaborating questions. Ask the participants if they have final things to add. 9. Finalize the exercise and thank the participants. Explain to them what the need of the map will be.
Data analysis	Make a cross check between answers from the questionnaires and the mapping exercise. Compare with photos of the plantation and crosscheck with performed observations and measurements of the plantation.

Focus groups: Future scenarios

Aim	Identify future wishes, ideas and scenarios for the use and possible benefits of the plantation
Theory/framework	-Applied theory about brainstorming activities (Kaner et al., 1996) -PRA methods (Mikkelsen, 1995) -SL framework (DFID, 1999)
Participants and sampling method	We will conduct 2-3 separate focus groups, depending on the time/participants available. The selection for the focus group will depend on who the identified users are, but it will be interesting to create focus groups with different combinations of users/non-users and different socioeconomic groups to see which future scenarios are presented. Groups of 5-10 participants will be preferable
Preparations	Select and inform participants of an appropriate time and place Brief the translator on the exercise and ensure he understands the aim and flow Assess if the participants are able to read or if drawings are

	needed
Materials	Paper, pens, cards
Time needed	2-3 hours per focus group
Process	1. Explain the purpose of the exercise to the participants and present them with the materials. Inform them that we are not looking to find one perfect solution to be implemented, but are interested in ideas and wishes that can be further developed in the village after our field work. 2. Simplified SWAT: Ask the group to identify (draw/write) the strengths and weaknesses/challenges of the current use of the plantation. Remember to inform them that this is a brainstorm and they should not discuss it too much, but be open to all suggestions (divergent thinking - Kaner) 3. Ask the participants to select the three most important challenges and strengths (convergent thinking) 4. Participants should explore ideas about possible benefits they would like to have from the plantation in the future and write them on separate cards 5. Participants should identify opportunities and/or constraints to make the benefit come true. 6. If possible identify possible action steps to realize the benefits 7. Finalize the exercise and thank the participants. Explain to them what the need of the exercise will be.
Data analysis	

Livelihood analysis

Aim	To get a broad understanding of the livelihood strategies of the villagers
Theory/framework	-SL framework (DFID 1999) - Empowerment guide (MS/ActionAid, 2010)
Participants and sampling method	Participants will be selected based on the wealth raking and preferably 2 households from each identified income category should be interviewed. These will serve as case studies and will not be representative for the whole village.
Preparations	Select participating households and set a time for the meeting Brief the translator on the exercise and ensure he understands the aim and flow
Materials	Paper, cards, pens, beans/stones
Time needed	1 hour per household
Process	1. Mark the coordinates of the household with the GPS 2. Explain the purpose of the exercise to the participants and present them with the materials. Explain that we want to get all the resources available to them 3. Ask participants to identify their resources – ask them to consider if it is a basic household need and if it is a resource for income (Take notes). Each agreed resource is written n a separate card 4. Draw a big circle on the piece of paper. Ask the participants to place the cards on the circle depending on if the resources is widely available (inside circle), partially available (on the line) or

	completely unavailable (outside the circle). 5. Indicate the importance of each resource by piling stones or other objects on the cards – the more stones, the higher the importance 6. Ask explorative questions in regards to the importance of the resources 7. Finalize the exercise and thank the participants. Explain to them what the need of the information will be.
Data analysis	Transfer the data to a pie chart and plot into the SL framework

Mapping of institutional relationships

Aim	To get an understanding of decision-making institutions in the village and how villagers connect themselves to decision-making. Specifically decision-making in relation to access rights of the plantation is interesting.
Theory/framework	-Access rights (Ribot, 2003) -PRA methods (Mikkelsen, 1995) - Empowerment guide (MS/ActionAid, 2010)
Participants and sampling method	Participants will be selected through a snowballing process starting with our translator. Preferably participants should be from different socioeconomic backgrounds
Preparations	Select and inform participants of an appropriate time and place Brief the translator on the exercise and ensure he understands the aim and flow Assess if the participants are able to read or if drawings are needed
Materials	Paper, pens
Time needed	
Process	1. Explain the purpose of the exercise to the participants and present them with the materials. Explain that we are interested in all institutions and decision-making bodies (formal/informal) 2. Ask the participants to make a list of all institutions operating in the village and specifically the institutions in relation to the plantation. They are allowed to indicate individuals of key importance/power. Write each of them on a separate card 3. Ask them to make circles representing the importance/influence of the institution to the participant 4. Ask explorative questions in regards to the importance of the institutions 5. Finalize the exercise and thank the participants. Explain to them what the need of the information will be.
Data analysis	

Synopsis - Appendix V - Guidelines for semi-structured Interviews

+ Introduction

"What are the access rights" → Interview with villagers

Sampling method: (stratified) random sampling (→ distance based)

Questions	Expected results
Introductory Questions: **Tell us a little bit about yourself** (what are you doing at the moment, where do you live, how many people living in the household? **main source of income**? etc…)	- general stuff, who are we talking to (is the respondent talking to), getting to know each other… - main source of income!
Are you using the plantation somehow? ➔ yes → tab. 1 ➔ no → tab. 2	- distribution between plantation-users and non-users

tab. 1 (plantation-users) → *"who are the users of the plantation"*

What are you using in the plantation/ For what are you using it? ➔ firewood → **which/how much?** ➔ bee keeping → ***** ➔ etc. → which/how much? differences during a year? using it for yourself or selling it? (how much do you sell? Where? Price?)	- uses of the plantation
Do you collect firewood/berries/etc. as much as you want? How much? What exactly (which timber)? Are there any restrictions? Do you have to ask someone (who?) to collect? What do you have to do to get permission? (paying money?) Does anybody who wants can collect something (Even strangers?)? If not, consequences? How important is collecting firewood/berries from the plantation for you? What would happen if you would be no longer allowed to collect? How much are you dependent on the plantation (in comparison to your major income source)?	- access rights - importance of plantation

* **bee keepers**: - how many beehives to you keep? - which kind? modern/traditional - what do you produce from bee keeping? (except of honey) Why? - are you trained in bee keeping? - Would you like to keep more? - problems in bee keeping (health/environmental/etc.) - what measures to solve problems? - what equipment are you using during production? - who collects the honey (man/woman/children?) - Any restrictions? (Anyone who wants to have beehives is allowed to?) - Do you have to ask someone (who?) to add hives? - What kind of restrictions? - Do you have to pay (money/resources) for keeping bees?/ do you get support? (what kind of support?) - How do you get a permission? - what happens if you are not allowed to keep anymore? - how important is bee keeping for you/ for your income (in comparison to your major income) What happens if someone enters your protected bee area (?)… steals your honey/bees? Who do you inform? What are the consequences for the person? Why do you keep bees? What is your motivation? (Financial, nutritional, etc.)	- access rights for bee keepers - importance of bee keeping

tab. 2 (non-plantation-users)

Why are you not using the plantation? - using timber/berries/etc. outside the plantation (why outside?) ➔ no access or no necessity etc.? - would you use it, if… < distance …	- reasons for non using (no necessity, no access rights etc.)

Key-informer interview → Headman → *"Access rights"* & *"Future"*

Questions	Expected results
INTRODUCTION QUESTIONS…	
Access rights: - Who is /are you the/is there a owner of the plantation? - Who is in charge of the plantation? - Who allows people to collect/keep bees? - Do people have to ask you/the owner? (Do you think people collect without asking?) - What happens if they don´t ask? - is someone managing the plantation? → who/how/what etc.	- ?? - Ownership, Access rights
Future: - is the way of handling the plantation unchanged in the future? - is something planned within the future? - could you imagine any improvements?	- future scenarios?

notes:

- probably not more than one interview with headman? (access & future in one?)
- more unstructured than semi-structured?

Synopsis - Appendix VI – Forest Resource Assessment

Measurements will be taken from each stratum and will be analyzed independently to assess and estimate the following parameters:

Diameter: *"Diameter measurement is important because it is one of the directly measurable dimensions from which tree cross-sectional area, surface area, and volume can be computed*" (Husch et al, 2003, p.85). The diameter of a standing tree is taken at 1.3 m or 4.5ft above ground level and is referred to as breast height diameter (dbh) (Husch et al, 2003).

"*When a tree consists of two or more stems forking below breast height, measure each stem separately. when a tree forks at or above breast height , measure it as one tree .If the fork occurs at breast height , or slightly above , measure the diameter below the enlargement caused by the fork . The most commonly used instruments for measuring dbh and d are callipers and diameter tape*" (Husch et al, 2003, p. 87).Diameter of sample trees in each stratum will be measured and recorded using diameter tape. Then, average diameter of each stratum in particular and the total plantation in general will be calculated and analyzed.

Height: *"Most height measurements of all trees are taken indirectly with hypsometers. Hypsometers are based on the relation of the legs of similar triangles (geometric) or on the tangents of angles (trigonometric).(Note that terms such as altimeter and clinometers are also applied to instruments that are used to measure height*" (Husch et al , 2003, p. 101).

Height of sample trees in each stratum will be measured and recorded using clinometers from a distance of about 50 m depending on the height of the trees. Then, average height of each stratum in particular and the total plantation in general will be calculated and analyzed.

Cross sectional area: *"If the cross section of a tree is taken at breast height, it is called the basal area*" (Husch et al, 2003, p.94). Calculating the basal area of a tree or specified classes of trees per unit area is useful and is directly related to stand volume and density (Husch et al, 2003).Since basal area has the potential to indicate the stand volume and density of a given plantation, cross sectional area or basal area of each tree, stratum and the whole plantation will be calculated and analyzed using the standard formula.

Volume: *"Tree volume can be estimated from previously established relationships between certain tree dimensions and tree volume. Diameter, height, and form are the independent variables that are commonly used to determine the values of the dependent variable-tree volume"* (Husch et al, 2003, p. 136).The volume of each sampled tree in particular and the whole plantation in general will be calculated based on the information obtained from the height and diameter measurements of the trees.