

# **Interdisciplinary Land Use and Natural Resource Management**

## **Evaluation of Trees Situation in Zombodze**



**By**

**Loic Sanchez**

**Lianzhou Cui**

**Supervised by**

**Andreas de Neergaard and Quentin Gausset**

## **Abstract**

The study focuses on fruit trees and the different usages of wood in Zombodze - January 2004. The objective was to look into the usage of fruits, whether if fruits bear an economic value or if they are only used for private purposes. It appears that most of the fruits are mainly used for own consumption. As fruit trees are commonly found in the whole area, the demand is limited and the market becomes saturated.

Wood is the primary source of energy for the local population and also an important building material. The study focuses on both the assessment of local people's access to wood and the local management. The results show that the villagers are highly dependent on wood and have an unequal access. Furthermore the data collected showed that wood bears a commercial value as a timber product.

Finally, the report will try to give some suggestions in order to overcome the constraints that trees are facing in the area.

Keywords: management, fuel wood, commercial value, usages, access

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## **Introduction**

Tropical forests perform essential service such as biodiversity conservation, water regulation and carbon sequestration. And millions of people need these forests for food, shelter, soil and terrains protection, medicines and other products. Tropical forests function as a “safe net” for the poor.

The kingdom of Swaziland has a population of 995,000 with 75% living in rural area (MTEC 1999). The country is 17,360 km and the forest area is 788,433 ha in 1999. Man-made forests’ share of GDP is usually reported to around 10 percent (NDP 1996). This report is trying to focus on the situation of trees, including community and private forests, small woodlots and fruit trees in Zombodze.

Zombodze is within the Shisleweni administrative region of the country, in the south-western part of Swaziland near the South African border. Nearest town is Nhlangano to the west, approximately 20 km away. The village lays on a steep slope (Transect p.2) where the grazing area is located at the step and where the majority of wood can be found on the up-hill part of the area.

The biggest forest present in the area is the plantation of black wattle (*Acacia mearnsii*), gum and eucalyptus species belonging to a South African businessman (called Neal Montigny) (description of company p.6). Montigny Investment produces speciality/exotic items such as roofing, solid doors and other items that larger companies are not interested in manufacturing. This company is gearing up for the production of wood chips from wattle, for customers in the Far East. More than ten private woodlots are distributed in Zombodze. Black wattle is also found on communal land, in private woodlots and encroaching on unmanaged fields.

Fruit trees are found around each household and in the small orchards, including avocado, peach, banana, mango and guava...

In Zombodze the main products from trees are fruits and wood. So the research is divided into fruit trees and wood.

## **1. The research questions:**

### **1.a Fruit trees**

It has been decided to keep the original research questions from the synopsis for fruit trees because they fit to the real situation in Zombodze:

- 1) Assess the access to fruit trees and local people's management**
- 2) Constraints of access to fruit trees (both natural scientific aspects and social scientific aspects)**
- 3) How can the production of fruits be improved?**

### **1.b Wood**

First of all, it is important to explain the reason why the first research question has been reformulated from “fuel wood” to “wood”. As soon as we started discussing the project at the University of Swaziland with our counterparts, this issue came out to be an interesting and productive source of debate. Due to the large range of products that are provided by wood, the whole group agreed on the necessity to modify the scope of the study. Later on, the data collected by the questionnaire will confirm the new resolution. Wood (black wattle mainly (an alien specie perfectly adapted to the Swaziland natural conditions) and eucalyptus in fact) is still one of the main building materials is by far the first source of energy available for the villagers, and wood is also used to make pieces of furniture and tools. It still remains the cheapest and more accessible alternative for local people. Therefore the study will describe the situation of wood in Zombodze trying ti evaluate the consequences of the access on people's daily life. And taking into consideration the specific context some suggestions will be made at the end of the report in order to enhance people's livelihood. In order to

evaluate the constraints and opportunities offered by the local context some research questions have been formulated:

- 1) Assess the access to fuel wood and description of the management**
- 2) Constraints of access to fuel wood (both natural scientific aspects and social scientific aspects)**
- 3) How can the access to fuel wood be improved and secured?**

The final discussion (chapter 5) is dedicated to answering the research questions after confronting them to the findings and to their analysis.

## **1.Methodology:**

One of the objectives was to use a good range of methods to get accurate and diverse information.

The first two days were spent collecting data from the **questionnaire** with 220 households (half of the population of Zombodze) in order to get an overview of the area. Afterwards the data were put into a computer and be treated by **SPSS**: software that permits to make charts and pies of selected information for a latter analysis.

The **PRA methods** were used in order to get people involved and collect their perception on specific topics. Four of them were employed for different purposes: the **transect map** gives an overview of the area in term of soil texture, repartition of population, land use... and allows interesting correlations between these different aspects. In the **Matrix Ranking** the people selected randomly, rank the different constraints in a table on the basis of their own perception. The **Resource map** shows briefly the different dynamics or displacement of goods (in this case the tractors) inside the different zones. The **Seasonal calendar** was used for combining in one table the different harvesting season of every fruit. Then it is easier to visualize that some fruit trees produce more fruits on the long term than others which can give a better understanding of why people prefer to plant a certain tree than another.

**In-depth interviews** were intensely used to collect both quantitative and qualitative data. Along with this method **on-site observations** were undertaken to evaluate and identify the data collected. And finally it has been possible to experience a **participatory observation** following a woman while she was collecting wood. This method is interesting because it allows the investigator to become a participant, feeling and acting the same way as the person interviewed.



All these methods have selected by the whole group, and most of the time it was possible to combine two or three methods at the same, enhancing the diversity and the quantity of data collected (Ex: interview, observation).

## **4. Findings and discussion**

### **4a. Fruit trees**

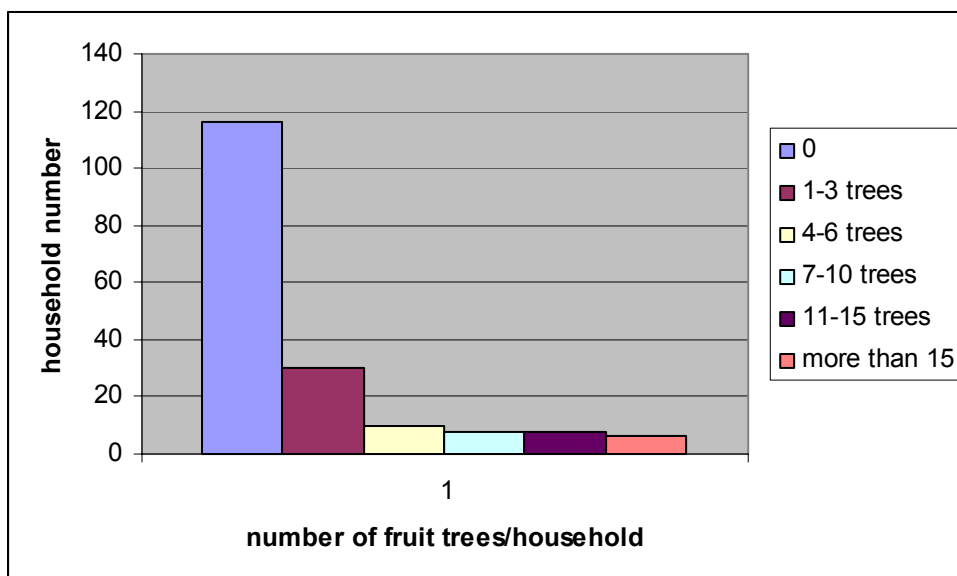
By analysing the data from the questionnaire, the result showed that the main species are peach, avocado, guava and banana, which represent 83.3% (Pie 1, p 10) of the total number of fruit trees. The number of trees per household varies greatly (Graph 1 p 10). For the whole population in the village there is an unequal distribution of fruits supply<sup>1</sup>. If people want to buy some fruits they can go to the local market (located in the central part of village, where the surplus of the private productions will be sold) or directly go to other households in different parts of the village which are rich in fruits. The location and the species of fruit trees, fruits' uses, management and constraints will be discussed.

#### **A. Location and species**

In Zombodze not all the families have fruit trees. The data collected from 180 questionnaires showed that there are 116 households which do not have any fruit trees. This result is quite different from the original assumption that trees could be found in every yard. The proportion of households having no trees is much higher than the household who have. Among the households who own trees the general trend (showed by graph 1) is that the number of households increases when the number of trees decreases.

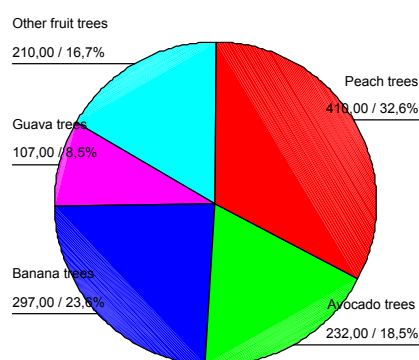
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<sup>1</sup> Appendices Resource map, p 3



Graph 1. Number of fruit trees per household

For each household who has fruit trees, these trees are always found around the house. This kind of location offers to the owner an easy access and more convenience to manage and protect his trees from thieves and threats from livestock.



Pie 1. Proportion of fruit trees

By analyzing data from the questionnaires, the pie above was made to show the percent of different species of fruit trees in village. According to this pie the most popular species are peach which represent 32.6% (410 trees) of all the fruit trees appearing in the questionnaire. The second one is banana with 23.6%; then the third and the fourth are avocado and guava, which represent 18.5% and 8.5% in total

number; others fruit trees (Mango, Orange, Mulberry, Grape, Fig ...) correspond to the last 16.7%.

In order to have a better understanding of different fruits species, a seasonal calendar was made to show the different harvesting season of each fruit. There are four seasons in Swaziland: Summer Feb-April; Autumn May-July; Winter Aug-Oct; Spring Nov-Jan.

**Table 1. Seasonal calendar of different fruits**

Fruits Harvesting season	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Peach (yellow)												
Peach (white)												
Peach (red)												
Small Banana												
Big Banana												
Mango												
Guavas												
Small Avocado												
Big Avocado												

For example, on the right of yellow peach there are two units which are filled in deep green. It means that the harvesting season for yellow peach is from January to February; white and red peach is from November to December. So the villagers can harvest peaches from November to February, a four months harvesting season.

The length of the harvesting season is probably one of the factors which influence people's selection of planting different species: preferring to select a long-term fruits supply. If pie 1 and table 1 are connected, it is interesting to find out that in table 1 peaches have a four months harvesting season, bananas have a six months harvesting season and guavas' harvesting season is two months; and in corresponding with pie 1, they represent a bigger percentage: peaches 32.6%, bananas 23.6% and guavas 8.5%. Avocado is special: the harvest season is two months and it takes 18.5% of the total amount, which is more than twice bigger than Mango's 8.5%. That is maybe due to other factors: profit, resistance and preferences, Avocado was sold for a good price (1 fruit for 1 rand) and they are quite resistant to pests.

**Table 2 Matrix ranking of fruit trees**

Trees	Food	Fertilizers	Market	Area soil type	Water source	Seedlings	Diseases	Labor
Peaches	7/10	Small manure	Good	Good	Average	Very good	Average	Good
Bananas	3/10	Average fertilizer	Good	Bad	Bad	Bad	Very bad	Bad
Oranges	1/10	Average fertilizer	Good	Average	Bad	Bad	Average	Bad
Naartjies	1/10	Average amount fertilizer	Good	Average	Bad	Bad	Average	Bad
Avocados	9/10	Small amount fertilizer	Good	Very good	Average	Very Good	Very good	Good
Mangoes	5/10	Small amount manure	Good	Poor	Bad	Bad	Bad	Average
Guavas	6/10	Small amount manure	Poor	Poor	Average	Good	Good	Average
Mulberry	3/10	No manure or fertilizer	No market	Average	Average	Good	Good	Average

The data presented in Table 2 were collected by talking with three local people. The purpose is to have an overview of different species in aspects of food, fertilizer, market, soil, water requirement, seedling, diseases and labour.

Table 2 showed why Peaches, Bananas and Avocados are popular (represent 32.6%, 23.6%, 18.5% of the total of fruit trees) in Zombodze: those fruits are part of the diet, have fewer requirements for fertilizer, soil, water and there is a market for them. Secondly, Mangoes and Guavas are also part of the diet but they did not represent a big percentage, because they all have their own weakness: Mangoes have a high requirement for soil, water, seedling and are sensitive to diseases, so it is not a good environment to plant Mangoes in Zombodze; in concern to Guavas, they grow easily but the price was low in the market (0.2 rand for one fruit). Thirdly for other species such as Oranges, Naartjies, Mulberry trees produce less and are not popular in the village.

## **B.Usage of fruits**

The usage of fruits is divided into own consumption and commercial purposes.

### **B1. Own consumption**

According to the information collected during the interviews, people use fruits mainly for own consumption. There are different ways to use fruits, such as eating directly, use for jam or cans. Probably because of the long harvesting season, eating directly is the most popular way. Some people make jam and can from peaches and guavas, partly because they are abundant and get rotten easily. If someone cans peaches, they peel the peaches, cut them into pieces and boiled them with sugar; after that put them into a glass bottle and seal the lid by heating. It is a simple technique and by doing this peaches can be conserved during almost one year.

Sometimes the villagers send fruits to their neighbours as gifts, creating or maintaining the social link.

## B2. Commercial purposes

People do not always sell fruits, unless there is a good harvesting and a surplus in the production. There are some orchards who plant fruit trees for commercial purpose. There is a small market in the central part of the village, people can go there and sell their products such as fruits, milk, maize... Due to the fact that fruit trees are popular and local people are poor in Zombodze, there is no great demand for fruits in the local market. So the villagers prefer to sell the fruits in Nhlangano or to the South African businessmen who come to buy fruits during the harvesting season.

Fruits	Price( Rand)
10 Peaches	1
1 Avocado	1
1 Guava	0.2
1 Big Banana	1
1 Small Banana	0.5
1 "Fish Mango"	1.5
1 Yellow Mango	0.5
3 Oranges	1

### **Chart 2. The price of each fruit**

This chart was made by conducting an interview with three local people and our interpreters. By looking at this chart, we can find that the most valuable species are Fish Mango and secondly are Avocado and Big Banana. Oranges, Small Bananas,



Yellow Mango, Guava and Peaches are less valuable. But mango does not grow well in this area and bananas are sensitive to insects, so avocado is the most profitable fruit.

## **C. Management and Constraints**

Most local people will more or less take care of the fruit trees. The management measures include: Plant trees, Sprinkle water, cut abundant branches, spray farm chemicals and Fertilizer, Build fence. There is no gender division; everyone in family can take care of fruit trees

### **C.1 Management**

#### **1/ Plant**

The villagers have three methods to plant fruit trees: by scattering directly the seeds, by buying young trees in town and transplant from the mountains.

Many people use the scattering method because it is very cheap but the survival rate is really low and the tree will need a long time to grow.

The second method is to build an orchard fast, and the young trees have a better survival rate and easy to grow comparing to directly scattering. But it is too expensive: 15 rand for a peach tree, 25 rand for an avocado tree. It is a big investment for the villagers.

It is easy to transplant Guava trees, because in a communal forest which is located in the top of the mountain area in zone 6 there are a lot of guava trees of different ages. People have free access to this forest. They can transplant young guava trees to their yards or even go to pick up guavas in harvesting season. But not many people do that because they cannot sell guavas for a good price and there are some poisonous snakes in that area.

## **2/ Sprinkle water**

According to the data collected during the interviews, not every family sprinkle water on fruit trees. For the people who water their trees, they do not water everyday, only some days or only in the evening. Because it is very hard for them to get water and if they water trees during daytime, the strong sunlight will dry the water quickly. For young trees, villagers water them more frequently. They water them twice a day: morning and evening for 1-2 years.

## **3/ Spring farm chemicals and Fertilizer**

Fertilizer is too expensive for the majority of the villagers; so many of them bury fallen leaves around their fruit trees and they believe that these leaves will turn into fertilizers.

For farm chemicals, it is too expensive for local people **Price** and they do not know how to use chemicals. The villagers have a problem with pests which make the fruits rotten before they are ripe (especially for peaches). When it was serious it could reduce half of the production of peaches and people have no idea to deal with this problem.

## **4/ Cut abundant branches**

Not every family do this management to their fruit trees, which requires a little knowledge of horticulture. It is a good method to increase fruits production. In one interview with the owner of a small orchard which has 12 peach trees, he said that he will cut abundant branches in winter, so the trees can concentrate on producing more fruits.

## **5/ Build fence**

In Zombodze it is quite necessary to have a fence around your house to protect your fruit trees from the attacks of goats and cows. The people complained about the fact that the livestock threaten mainly young trees and fruits, because these animals can go freely in the village and eat anything they can get access to. Unfortunately the

fence is expensive, even a simple fence will cost a lot (300 rand for 100 meters). In the mean time, it is quite interesting that there is a family who lived on the top of the mountain in zone 6, they find a good solution by using a kind of local aloe to build a fence around its yard. The aloes are everywhere in the mountain, so they just transplanted and planted them one by one, quite close to each other. Due to the thorns in these plants, goats and cows can not jump over it.

## **C2. Constraints**

The data collected during the questionnaires and the interviews showed that there are three main constraints for local people to develop more fruits productivity:

### **1/ Financial constraints**

Many homesteads can not afford the price of young trees from town (E25 for one young avocado tree), a fence around their houses, and farm chemicals (E20/tree per year). By comparing the increase in the production those treatments can produce with the financial investment they represent, the villagers think is not worth it to buy these things. People said the income that fruits can bring is good (E100-150 for one avocado tree in a good harvest), but comparing to other living necessities such as sugar and salt, fertilizers and chemicals are not so important. And if they have some money they are willing to invest more on maize instead of fruit trees.

Concerning the constraints of the market, people can only sell part of their production in the village. Due to the fact that there is no great demand in this village, sometimes they sell fruits in town or to the businessmen from South Africa. These businessmen come to Zombodze to buy fruits because it is located quite close to the border of South Africa. They can easily come and go back. When people want to sell fruits out of Zombodze, they have to pay for the transportation and probably face the

competition of some big plantations. So many people prefer to stay at home and wait for South Africa businessmen when the harvest is good.

There is a small orchard of 8 avocado trees and the owner has run this orchard for 20 years since his mother started this business. The purpose of setting up this orchard is to sell fruits. The owner has 3 income sources: Job, Maize and Fruits. A ranking test was conducted to verify the importance of these 3 incomes for him, the sequence is ranked as: Job, Maize, fruit tree business<sup>2</sup>. The point is since this orchard was run for a long time and for each avocado tree he can make up to 120-150 Rand per year. In the interview he said it was a good money for selling fruits but still less than the income from job and maize, he cannot see any reasons to plant more trees, 8 trees were enough for him.

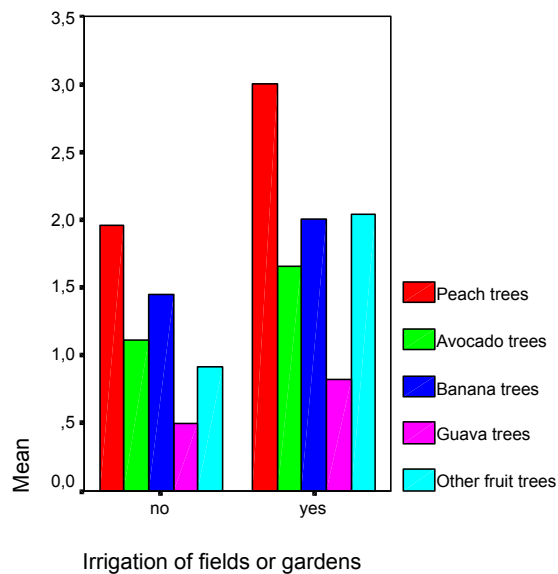
There is another orchard in the southern part of the village which has 60 avocado trees since 2001 and the area was fenced by using the owner's savings. He expected the first harvest in 3 years time and is planning to export. The point is after having conducted a certain number of interviews this is the only orchard which has so many fruit trees. This orchard did not start harvesting and selling fruits yet. So it is strange: in the orchard above which has a long history in selling avocados but only has 8 avocado trees. And considering the fact that most of the orchards in Zombodze are small, it is not convincing to say there is a big demand for fruits. Otherwise the experienced orchard owner would probably try to enhance his business by planting more trees.

## **2/ Natural constraints**

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<sup>2</sup> Table 4 p 27

Due to the different locations, people have different access to water and soil fertility. People who have an easy access to water will benefit from that, they can water young trees more frequently which will improve significantly the survival rate of young trees.



Graph 2. Correlation between number of fruit trees and irrigation

Above is a chart to show the correlation between the number of trees and irrigation. There are 22 households out of 180 who irrigate their fruit trees. These households have more fruit trees than others. ('Mean' refers to the number of trees).

Storm is a great threat; it happened in recent years in Zombodze which caused a lot of damages. Even some peach trees were broken by the storm.

Insects are serious problem for peaches, they often make peaches rotten in the core and fell down before they get ripen.

### **3/ Knowledge constraints**

The people we visited always complained about their loss of fruits caused by the insects. They said that they do not have enough knowledge to deal with this problem. They do not know what kind of insecticide they can use and how to use it. One informant described the pests of peaches. He said the pest was quite small and during the peaches' flowering period the larva will invade and later settled in the core of the young peaches. Then the larva would eat it from inside, grow up and do more damages, which will turn the peach rotten before it gets ripe.

At the same time many villagers do not know how to do more advanced management of fruit trees. Some of them know how to do some simple management such as cutting branches in winter but even this simple management is not widely spread in this village.

### **4.b wood**

First, it is important to understand the relevancy of the concept of access. In Zombodze gathered supplies of fuel wood constitute the main source of energy; most of the villagers do not have access to any other alternative source of energy. A reduction in the access will lead to a welfare loss for those affected.

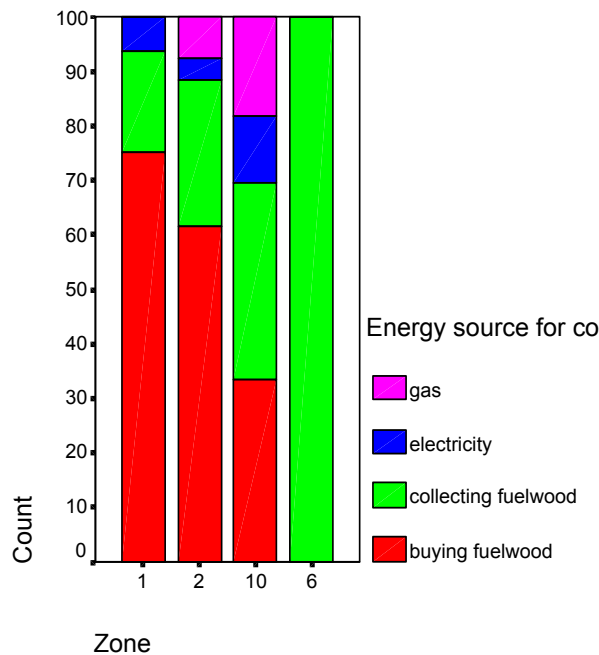


Chart1. Distribution of the energy source per zone

This chart is based on the data collected during the questionnaire and later analysed by SPSS. These four zones (1, 2, 10, 6) give an overview of the energy sources situation in Zombodze in January 2004<sup>3</sup>.

As it is possible to see on this chart, the people who live in zone 6 only collect wood. From this information it can be assumed that these people have a better access to wood than the one living in zone 1. The latter mostly buy firewood and have a limited access to other source of energy. Fuel wood is expensive for local people; therefore it is assumed that if they buy it is more by necessity rather than by choice. The study will investigate the reason that force people to buy. But more than anything else this chart illustrates the general repartition of energy, showing that the people living in the

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<sup>3</sup> Map 1 p.1

eastern part (zone6) of the area have a better access to wood than the one living in the western part (zone1). Also richer families that live in the centre of the village use gas.

To say it short, when looking at the source of energy used in different zones, it shows that on one hand the location of the homestead appears to be a determinant factor in the definition of the access and on the other wood corresponds at least to 70% of the energy used by the household.

### **A/The location of the woodlot as one of the determinant of the access:**

In order to make the description of the area <sup>4</sup> more understandable for the reader, the group decided to use the ten zones defined previously by the teachers. Even though these zones are not representative of any kind of geographical unity, they correspond to the sub-areas used during the questionnaire. Therefore the zones are seen as a tool defining sub-areas where the people who live in have, in term of distances, the same access to wood.

The location of the homestead can influence the accessibility to wood either in a negative way if it is distant from any woodlot (or the plantation) or in a positive way, if the homestead is situated near a woodlot. Before starting the analysis of the findings, it is necessary to clarify briefly the concept of distance by replacing it in the local context. The distances in the village are easier to calculate in term of time than by simply taking the distance on the ground. Taking into account the relief of the area (see description in chapter 1) the collect of fuel wood becomes a hard task to undertake when in most of the cases the women (she is in charge of the collect) will have to walk, loaded with a bunch of faggots on balance on her head, on a relatively steep track. As a result it becomes difficult for her to walk long distances. During the field trip it has been possible to participate to one of these excursions, and the observation reveals that for an homestead located relatively close to a woodlot (less than 500m, in Zone8) it will takes a bit one hour and a half to go there, cut the branches, collect and come back

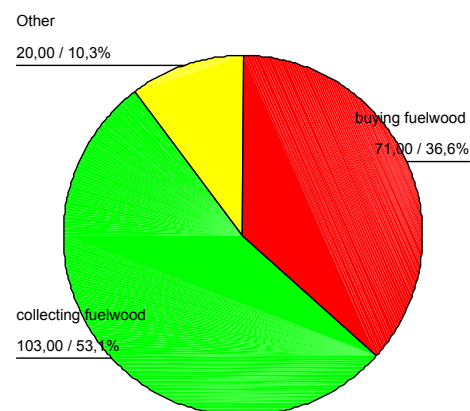
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<sup>4</sup> map 1 p1



loaded. This example corresponds to a family of three children and one adult. The collect of wood will be repeated three times per week. Other data collected during interviews conducted in more remote places, show that it will take approximately three hours for a woman who lives in zone3 to collect her daily supply of wood in the plantation (in zone6). This woman is the head of a family of four members, and she also collects wood three times per week. So, the walking distances are not the same for all the persons who collect wood in Zombodze and consequently the collection will prevent some people (women) from doing other kind of activities.

Now we can move one step further in the analysis of the findings by looking at the correlation between the location of the homestead and the way people acquire their wood either by buying or collecting it.



Pie 2. How people acquire fuel wood

The combined analysis of Pie 2 and Chart 1 show that zones 1-2-3-4, which correspond to the low field (or grazing area), are both scarce in wood and are the zones where people buy more fuel wood. But as all the villagers have an open access to the communal woodlots the women from the poorest households will walk to the closest one or to the plantation to collect.

This was the first possible argument proposed by the study to explain why the majority of the people collect rather than buy wood. Another argument can be found in the price of the price of wood either in the private woodlots or for a delivery. Some tractors owners transport wood from the forest or woodlots to the homesteads. The resource map<sup>5</sup> shows that even though tractors are available in the whole area the one used for this specific purpose are situated in priority in the zones where the scarcity of wood is the most visible. Two interviews have been conducted with two tractors owners. At the first place, they bought the tractor to work in the fields, but only two years after starting the business they admit that the delivery of wood has been a lucrative and flourishing business for them. One of them, just after retiring, started the business with his two sons and uses his tractor mainly for the delivery. He has some steady customers and charges R250 for a full load plough of wood (R150 for a small one). On a basis of a five-member family (two adults and three kids) the smallest load (3.8 m<sup>3</sup>) will last around one month time. It takes him around two hours and a half (average time) to get to the woodlot, collect the trees and deliver them. He makes 2-3 deliveries per week. The main constraint he has to face is the road structure. So, on a regular basis, the deliveryman earns between R2000 and R3000 (probably in winter) per month. From that he has to withdraw the money spent in the gasoline plus the maintenance of the tractor (an old Massey Ferguson). Also he has to split the money between him and his sons. But contrary to maize his business is not so dependent on the weather conditions and the consumption of wood is stable enough to allow him to have also a steady income.

The other deliveryman is currently employed by the plantation and delivers wood only twice, three times a month. As he beneficiates from a favourable access to the forest, he can buy and sells wood directly from there.

The delivery is a local solution to cope with the scarcity of wood as long as there are a sufficient number of people able to afford the price. But still it is a luxury

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<sup>5</sup> Appendices p.3

that only the wealthiest households (who have at least one member working in town) can afford. As long as people can afford it, they will take the option to buy wood instead of using a lot of time and energy in collecting. Their priority remains maize. The reader has to keep in mind that for some obvious reasons most of the local people (some did) did not admit openly that they “will take without permission” wood from the private woodlots. On another hand, some private owners are also selling wood.

So, to say it short, the people living in the low field have four options to get wood: buying from the tractor or to the local woodlot, collecting or finally “taking without permission”. It is more a combination of the four (depending on the labour demand of maize, on the money available and on people’s health) than exclusively one of them. Of course, the role plays by the thieving does not appear in the statistics but according to what the owners of the private woodlots say and what has been observed stealing is commonly perpetrated in the area.

However the number of people buying wood is surprisingly high (36.6%<sup>6</sup>) if we take into consideration that most of the villagers are poor people who can barely afford a bus ticket to Nhlangano. As part of the analysis of the findings the study looked for an explanation for what appeared as a non-sense in people’s behaviour.

Table 4. Priority Ranking

<u>Activities</u>	<u>Ranking</u>
Work	1

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<sup>6</sup> Pie 2, p5

Maize	2
Fruits (if selling)	3
Other (wood collection included)	4

As a PRA method the villagers had to rank their priorities, the production of maize appeared to be their first priority (or second if they have a job) when the collect of wood is never ranked among the first priorities<sup>7</sup>. Maize is the first source of subsistence of the household. Nevertheless, that does not mean that wood is not an indispensable material for the household daily life. People just do not perceive the collection of wood as a major activity. However it can be a lost of time especially when the same actor has to undertake both tasks<sup>8</sup>, when the woman is collecting wood is detrimental to the production of maize. So the purchase of wood becomes the best solution for the homesteads that live far from the wood stocks. Then, the question is why those people do not plant some trees on their plots of land for wood purposes? As it has been discussed before there is no real restriction on private land. Also there is no land shortage in Zombodze, the observations show some of the fields are uncultivated. Therefore the answers given by the farmers are just repeating the former ranking, they prioritize maize and will not to take a piece of land away to plant on trees instead (Table 3, conclusion).

As a matter of fact the location of the homestead becomes advantageous when the latter is located close to a woodlot or the plantation. Then this homestead is supposed to benefit from having a better and free access to wood than another situated in the low field. Even though the location of both the homestead and the woodlot play an

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<sup>7</sup> Ranking p.9

<sup>8</sup> The father passed away, he is working in town or simply for cultural reasons (gender divisions of tasks)

important role in the definition of the access this study tried to show that a series of others factor interfere in the process of acquiring wood. But it's the ownership that will play the most important role by defining the right to use.

## **B/ Land tenure one of the determinant of the access to wood**

Before going into more details, it is necessary to clarify a bit the complex issue of land tenure in Swaziland. Swazi Nation Land (SNL, public and common land), which is the totality of the land available in the country, belongs to the King<sup>9</sup>. Then, the chief is the direct representative of the King at the local level and as such he is responsible for the allocation of the land in his area. However, the direct consequence of this system is that the legislation relevant to forestry is often inadequately enforced and strong divisions between modern and traditional structures have been identified during the field trip (regarding the way the plantation acquired its land). Nonetheless a legislation that may affect forestry is available<sup>10</sup> which regulates the access to fuel wood on SNL by allowing “the collect and cutting of underwood and bushes” (Forests Preservation Act, 1910). Even though the measures formulated in the acts have not been fully implemented it is possible today to identify three types of land tenure which will determine different types of usages and access. To allow the reader to have a better overview of the area regarding the land tenure it has been possible to map it: the private woodlots correspond to the red circle, the common pool resources are in blue, the wood owned by the parliament is in green and the graveyard is in yellow (woodlot tenure map p.4).

### **B.1 The Commonly owned woodlot:**

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<sup>9</sup> Rweyemanu Novatus, “The Swazi Chief and the Written Law”

<sup>10</sup> Presented in Carsten Smith Olsen and Finn Helles

As it has been explained before, the majority of land corresponds to a public and common land where the villager can enjoy a free access. As it possible to see on the map<sup>11</sup>, the few wood stocks available on communal land are unequally spread around the area and also have different size restricting automatically the number of users. The primary users have the feeling to be responsible for the place therefore they establish a kind of management of the woodlot in order to maintain but not enhance the productivity. The type of management (discussed in part C) is not strictly observed by all the users, but seems to function anyway: the wood is regenerating. One of the aspects revealed by the “tragedy of the common” is that some of the users will not let grow the trees enough time to allow them to reach a suitable size for building purposes. This type of management relies only on every user’s sense of responsibility nothing will prevent one from cutting a tree that others are letting grow. The lack of control and competing interests are the first threats encountered by community forestry. That could be one of the reason why comparing the map from 1972 – 1993 – 2001 we see that on one hand, the number of small woodlots have decreased during this period and on the other, the plantation has expanded.

## **B.2 The Privately owned woodlot and forest (red colour on the map):**

“While privatisation can create a more favourable environment for those with rights to land to invest in maintaining or creating woody resources, it can severely

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<sup>11</sup> Woodlot tenure map p. 4

disadvantage those without land, unless their needs are recognised and also taken into account.” CIFOR *Occasional Paper No. 39*, p.30

The whole issue of land tenure is difficult especially in a Swazi context where a real land policy is still missing. This study tries, with caution, to address this issue first by stating the current situation (chapter 2) and later by making some suggestions (conclusion). But to put under a Zombozde perspective the comment formulated in the former quote, the villagers who have a restricted access to land (people living on the slope of the plantation) become highly dependent on the resources belonging to the people who have a better access to those resources<sup>12</sup>. When the first owner of the plantation bought the land some families were already living on it. He decided to let them stay. Also these people are among the poorest of the area. For some years now, they have seen their land shrinking for the benefit of the expansion of the plantation and therefore their production of maize, on which they rely on for a living has diminishing. He uses the fact that forestry is more profitable than agriculture (at least in the area) to require the use of some of the farmers land next to the plantation This way of acting is maybe the implementation of what Neal’s father meant by: “*My son came up with some good ideas for expanding the business*”<sup>13</sup>. This is one aspect of the whole issue, on the other hand it is not proved that if the villagers in Zombodze had a better right to land they would necessarily “maintain or create woody resources”. Observations and interviews showed it would be quite unlikely... But before that the access to land has to be secured.

A private person has the permission to plant trees and use the wood for any purpose (commercial or private). By law (1997 b, SEAP), the local authority can prevent a farmer from planting trees on a very suitable plot for agriculture. Even

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<sup>12</sup> 52% of the land is SNL and sustain 70% of the population; large scale individual tenure represents 47% of land and support 10% of the population.

[http://www.ossrea.net/publications/abstracts/series\\_publications.htm](http://www.ossrea.net/publications/abstracts/series_publications.htm)

<sup>13</sup> Quoted during an interview conducted with Neal’s father at Montigny Group of Companies

though the case never happened in Zombodze, the farmer is not sure to benefit from his trees after they get mature (7-8 years). The lack of forestry policy encouraging small timber producers, although it is not the main reason why people do not plant more trees, can be one more argument for the farmer to plant maize instead. To cope with this situation, some timber companies, such as Montigny propose a Purchase Agreement<sup>14</sup>, with the purpose of promoting the business and having the deal in writing. On one hand, they supply the farmer with seeds, fertilizers but on the other hand, the company “reserves the right to regulate the volume of timber supplied” by the farmer (Act. 4/5). Even though the business is expending at the moment, the owner of the plantation admits that it has not always been the case. By setting the contract this way, the buyer insures himself that in case of surplus of production, the supplier will be paying the actual cost.

The access to the plantation is a complex and informal issue. The interviews conducted with the owner show that there is a free access to wood, when the interviews conducted with the villagers reveal a much more unclear situation. According to the latter it seems that there is an unofficial agreement between both Mr Montigny and the neighbours of the forest and also with the people who have been working or are still working in the plantation. Those people have a *privileged* access compare to the rest of the villagers who are not allowed to collect. They need the owner’s permission to collect fuel wood, what he will accept to give, **most** of the time. If he does not allow them, the villagers will not have any other option but to go by night to the plantation, steal the wood and be careful to do not get beaten up by the guards (villagers also) who keep on the forest. Also those same people live so close to the plantation that Neal uses them as “watch dogs” preventing the villagers to steal wood in the area next to their house. Otherwise it would become too easy for the owner to accuse them from stealing wood. Despite the *double control* effectuated both by the guards and by the neighbours

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<sup>14</sup> Contract p.5



it is still impossible for the owner to prevent robberies. Therefore by accepting and refusing alternatively the access, he manages somehow to avoid abuses.

Also, it has been possible to identify a family owned woodlot (zone9), where several members from the same family agree on using and maintaining a small woodlot planted by the former generation. Unfortunately this type of woodlots does not produce enough wood to be used as a fuel wood pool; it is mainly used for building materials. The private woodlots identify today in Zombodze are descendent from the one created by the grandparents. But today no one is planting more trees for only fuel wood purposes. People think that the roots will turn the soil unsuitable for maize, trees use a lot of space and firewood can be acquired in different ways as it has been discussed before. Even though the owner of the small plantation located in Zone3 makes a living out of her woodlot, the low quantity of wood she sells does not justify any tentative of enhancement of the production. She earns twenty Rands for every five trees she sells and a three person's household burns one tree per week and two in winter. She is a widow and this business is her principal source of income even though the only help she gets is from her ten years old daughter. Alone she is unable to keep the thieves out of her wood; it would be too expensive and even useless to fence the wood.

### **B.3 The woodlot owned by the Inner Council (green on the map):**

The last ownership that has been identified during this field trip is a woodlot belonging to the Inner council. It has been taken from a farmer who was caught stealing someone's cows (!). It is presently prohibited to collect wood in this woodlot.

### **C/ Management**

The question of the management of wood appears in one of the research question. Therefore is something that has been investigating mainly through interviews and on-site observations. The findings show that it is possible to correlate the type of ownership with a certain type of management.

The people using a common property woodlot collect wood during a certain period of time in one side of the forest while the other side is under the process of regenerating. This type of management contrasts with the one used in the plantation which is intensively and sustainable managed<sup>15</sup>. Trees are planted every year, and the productivity is optimized by the use of fertilizers. The observations showed that in general the common woodlands are poorly managed. To remedy to this situation a draft of the new national forestry policy is on its way and calls for the establishment of natural resources management committees in each chiefdom who will oversee the protection, management and use of all forest resources in their chiefdoms and areas. This project has been accepted and supported by the chiefs and communities. As a result of this a total of twenty-two trees (alien species) have arrived in Zombodze. Those trees belong to the community and are under the responsibility of the agriculture officer (not the Chief) in order to first build a windbreak just next to the “Centre” and then for shade and building material purposes. Later on some indigenous fruit trees will also be planted to provide a common reserve for the villagers.

Another type of management has been identified in the private woodlots where the trees selected for building purposes are, on an early stage, pruned to allow them to grow straight and for a longer time (four-five years). Otherwise the tree grows wild and turns into a small bush more suitable for firewood. In some cases, the legislation will define the type of management when for instance The Wattle Bark Control Act from 1972<sup>16</sup> does not allow the stripping of immature bark or bark trees less than eight years old. For the sake of protecting the good development of the forest, this specific Act hinders greatly the bark factory situated in Nhlangano (which is partly supplied by

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<sup>15</sup> See figures in Appendices p.7

<sup>16</sup> Cf. C. Smith Olsen and F. Helles

Montigny) from obtaining the necessary amount of raw materials for its annual production.

Except for those few examples, trees used for firewood do not need a lot of attention. “Swaziland meets all the conditions required to develop forestry” said Neal’s father during an interview. The climate and the soil are suitable for trees expansion. The constraints that people are facing regarding trees have to be found somewhere else.

#### **D/ The Constraints**

By focusing on the complex and informal aspects of the access to wood in Zombodze, this study comes within the scope of the energy debate ongoing for the last thirty years. But it is important to highlight once more that in the attempt to improve the rural areas livelihood the reader has to keep in mind that inside the same communities, within the same family and even within the same household people are affected differently by the general poor access they have to energy resources. The scarcity of wood has first and foremost some repercussions on female activities. In the social division of gender roles, the woman traditionally undertakes a series of tasks related to the reproduction of the family such as: taking care of the child, cooking (using firewood), cleaning the house (made of wood) and so on... Consequently and taking into account the local context, wood becomes part of women daily life. Of course, wood forms just one component of the whole process but an improved and more secured access will contribute greatly to enable especially women and child to take better advantages to escape poverty. By reducing the time they spend (in Zombodze is not unusual it takes between 2-3 hours every second day) collecting firewood it will increase equally the time they might have for education or more remunerative activities and therefore create opportunities to go out of the poverty cycle.

But in a country where the percentage of people having HIV is the highest in the world it is understandable that the villagers seldom mentioned firewood as their main preoccupation. However, it should be possible to overcome some of the constraints (listed in Table 5) with the view of enhancing a little bit people living conditions in Zombodze. The last part will be dedicated to propose some suggestions in order to improve and secure the access to wood.

**Table 5. The constraints of wood**

Uses	Constraints	Consequences
Energy source	Scarcity of fuel wood	Time to collect
	Cost of fuel wood	Distance to collect
	Privatisation of land	Limit the access
	Preference to plant maize or graze cattle	Nobody plants trees
Building material	Available trees not of sufficient size	Cost / market
		Preference for Eucalyptus
Plantation	Service delivery	Distance, infrastructures, lack of awareness of service
	Export to South Africa	

## **Conclusion**

During this report a certain number of issues have been addressed and the time has come now to go back to the research question and to discuss the finding under the light of these questions.

#### 1/ Fruit trees:

The financial constraint and the constraint for the market are two main constraints for planting more fruit trees.

The financial constraint is more serious for the people who have a small number of trees: they need money to invest into it if they want to run this business. It is a good idea to save money by transplanting the Aloes from the mountain to the low fields in order to build fence. Maybe the government or some organizations can create a fund for helping local people to buy young trees.

For the people who already have an orchard, the constraint for the market is the most important. Due to the fact that there is no a big demand for fruits in the village, if they can find a steady customer outside the village initiatively and make a long-term contract to supply him with fruits, it would be better than staying at home and waiting for a South African businessman to come during the harvesting season.

Concerning to the natural constraints, Storm, Pests and Water shortages are the three main natural constraints for fruit trees in Zombodze, which have a big influence on both fruit trees survival rate and productivity. The solutions that can be proposed here in order to overcome the natural constraints are too expensive to be realistically applied to the Zombodze context.

Inside the village there are a few people who have some basic horticultural knowledge about fruit tree management. It will be quite helpful if a workshop could be set up allowing people to exchange fruit trees management knowledge and experiences.

#### 2/ Wood:

First, it is important to say that no overall deficiency has been identified in the area. Some areas have fewer trees than others, but nobody in Zombodze is missing wood.

Relying on the facts that, nobody in Zombodze is complaining about the wood situation, the general conditions (social and natural constraints) are favourable for trees to grow and finally the district does not import trees in significant quantities the concept of “wood crisis” cannot be applied here. The only reasons that have been identify why people do not plant trees are because they want to focus on maize, they can always manage to get wood anyway even though it will cost them time or money and the last reason is due to a lack of knowledge in term of soil fertility and the degree of invasion of trees. Therefore taking into account the tree situation in Zombodze this study tried to focus on what could be done in order to enhance people’s livelihood.

#### 1/a. The community pool resource:

The first step for this improvement will be to develop a new forest policy that takes account of people’s dependency on wood and propose a better management of this resource. As the villagers seem reluctant to plant trees on their land one of the suggestion would be to promote community ownership under the forestry office management how it is already the case in Ethiopia or in others community in Swaziland.

#### 1/b. The private woodlot:

As it has been mentioned before one of the reason why the villagers do not plant trees is because they do not deem it necessary and a shift in the forest policy should be also needed. A better access to wood will definitely create opportunities to step out of the poverty cycle. Also Montigny Investments is expanding and looking for new partners. There is also a bark factory in Nhlangano in need of new suppliers. The farmer willing to start this business will have to face a series of constraints (thieves, unpopularity in the village...) and the long-term investment (maize is a short term

investment) makes that no one so far in Zombodze has planned to plant trees for a commercial purpose.

1/c. The partly private woodlot:

With our knowledge of the area, which is not complete, one of the solutions will be to create woodlots partly owned by a group of neighbours. Every owner should buy or give a plot of his land. The access will be strictly open to the owners who living in the next surrounding of the wood would take care of it and due to the reduced number of users would agree more easily than other cases on the type of management to adopt.

1/d. The use of stoves

Also the majority of the people that this study has visited are using an open fireplace where the noxious fumes floating and stagnant in the house damage consequently people lungs. The use of stoves would have positive effects both on people's health as on diminishing the wood consumption. But of course stoves remain expensive for the majority of the villagers who do not see the reason why they should purchase one.

## **Acknowledgements**

This report would not have been possible without the input from the many people who provided us with information and advice throughout the course of our research and the preparation of this final report. We are grateful to all those who contributed to the initial project studies. In addition, we owe a particular debt of gratitude to our two supervisors: Quentin Gausset and Andreas De Neergaard. We also want to thank the entire teaching staff from the seven universities involved in the project. We appreciate them making available to us the results from major pieces of ongoing work of relevance to this report.

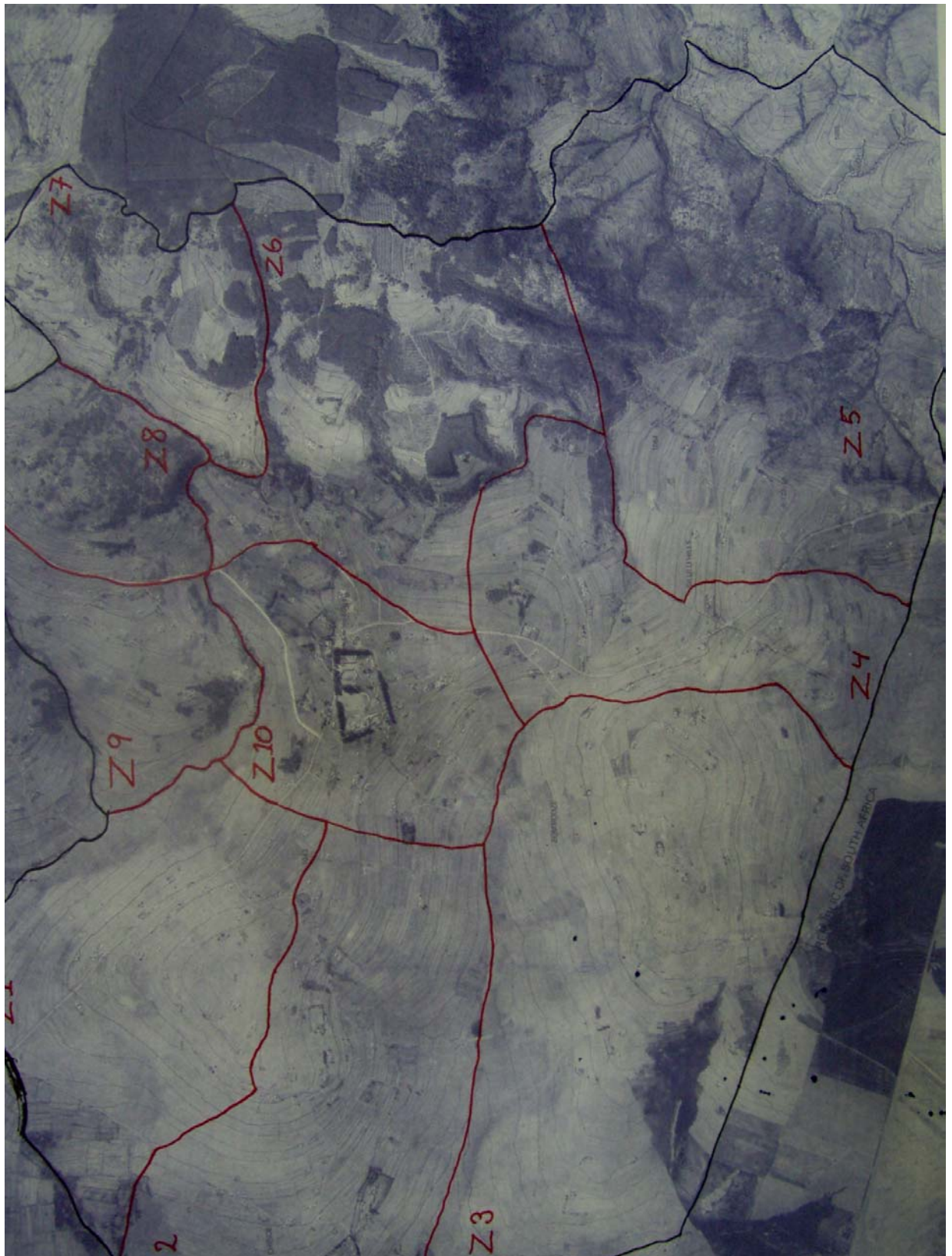
We want to acknowledge all those who participate actively in the project in Zombodze 2004 our partners: Trevor, Jabu, Seane, and Nonhlanhla and our interpreters Austin and Clement. And finally, we wish to express our appreciation to Danida and all the students and staff members from both Sluse and Sacuda for funding, participating and organizing the whole project.





## Appendices

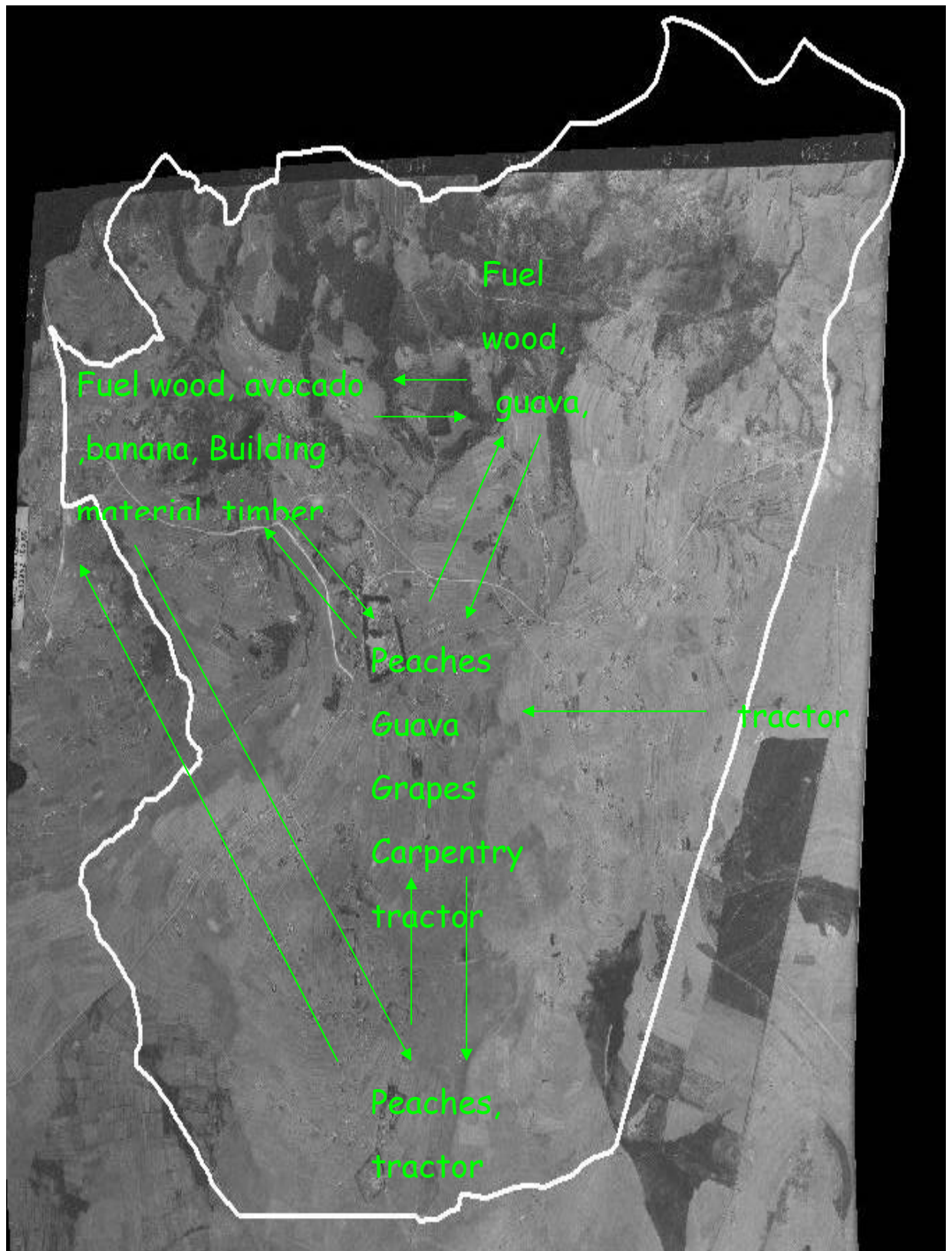
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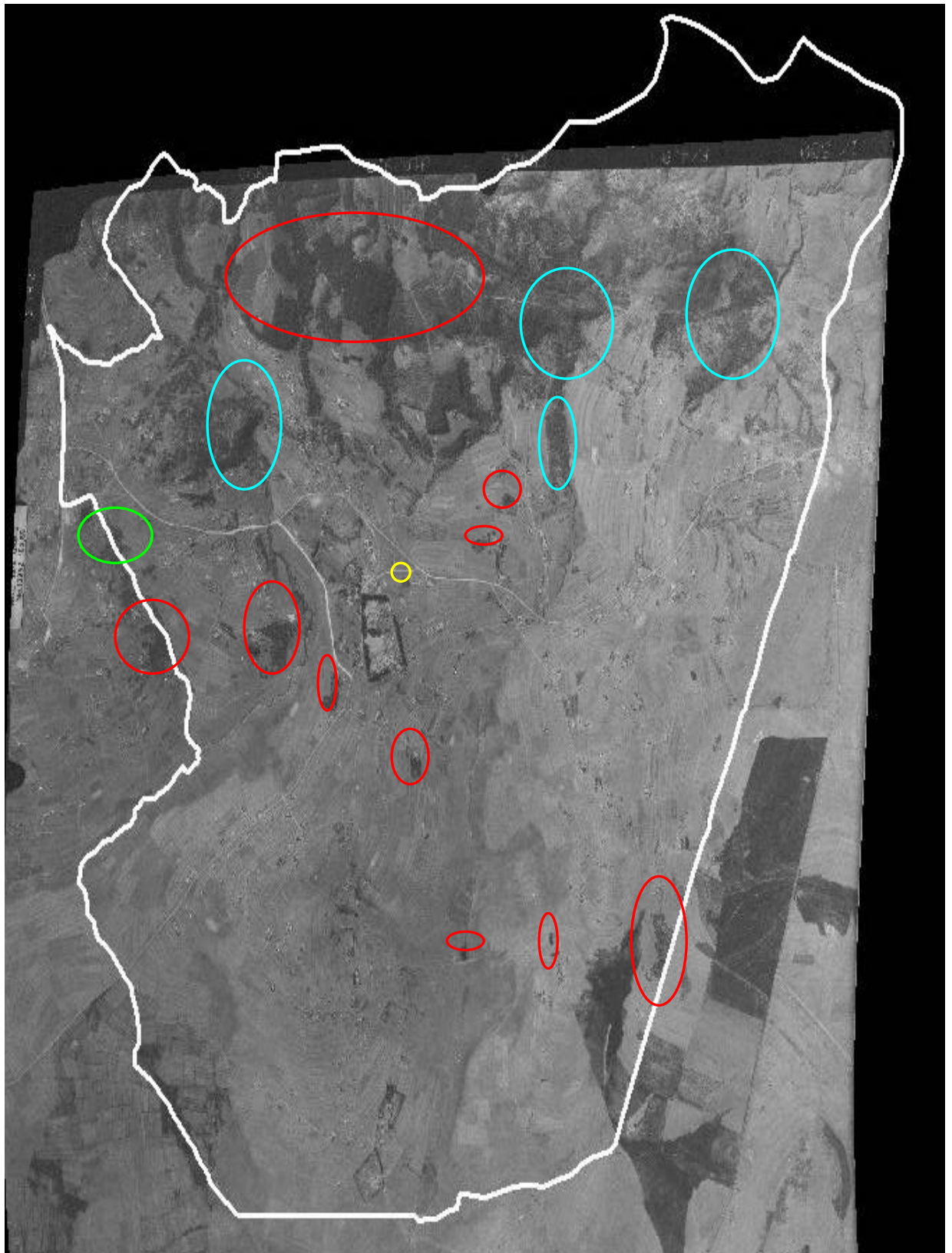
Map with zones







Resource map



**Distribution of woodlot**



### **Purchase Agreement**

Entered into by and between : \_\_\_\_\_

Montigny Investments (Pty) Ltd - Here in after known as the purchaser

and

Herein after known as the seller and registered owner of Farm no 1082  
Situating in the District of Shiselweni

- 1 ) The Purchaser shall guarantee the sale of all timber products ex sellers farm.  
Mining Timber  
Pulp (Both Wattle and Gum )  
Selected straight poles  
Laths and Droppers  
Charcoal - Bark
- 2 ) Payment shall be at premium prices plus E 5-00 per ton commitment bonus.
- 3 ) The purchaser undertakes to assist with advice in the establishment or re establishment of plantations as well as seedlings - Tractors for ploughing and extraction shall be made available at a nominal fee.
- 4 ) The seller irrevocably commits all his or her timber on the farm to Montigny Investments as sole purchaser.
- 5 ) The purchaser and seller shall liase on a regular basis to ascertain volumes and type of timber available for sale,so as to ensure a constant flow in relation to other suppliers.
- 6 ) The purchaser reserves the right to regulate the volume of timber supplied by the seller - every effort shall be made by the purchaser to equitably distribute the volume required among all the suppliers.
- 7 ) The seller shall receive, in writing, permission to supply the volumes required by Montigny Investments, during a specified time - no excess shall be permitted without authority from the purchaser.
- 8 ) Preference shall be given at all times to the committed farmers - non committed farmers shall only be allowed to supply if committed farmers cannot satisfy the demand.
- 9 ) In the event of the seller knowingly and without the consent of the purchaser disposes of the timber committed, the purchaser reserves the right to cancel this agreement forthwith and sue in a Court of Law for recompense in regard to assistance and other help, financially or otherwise, already given.

.....2.....

- 10) Montigny Investments shall appoint personnel to supervise and assist farmers where and when requested.
- 11) This agreement shall be valid for 10 (Ten) years from date of signature.
- 12) The seller acknowledges that this purchase agreement supercedes all other agreements and the seller hereby certifies that no other timber commitment has been made by him/her to any other person or parties.

Signed and dated at Nhlanguano on this 13<sup>th</sup> day of June 2001

**Montigny Investments**

Witness 1. [Signature]

Witness 2. N. Terblake

Signed and dated at Nhlanguano on this 13 day of June 2001

**Farm Owner**

Witness 1. [Signature]

Witness 2. [Signature]

**INTERNATIONAL TRADE CENTRE  
CENTRE DU COMMERCE INTERNATIONAL  
CENTRO DE COMERCIO INTERNACIONAL**

**SUBREGIONAL TRADE EXPANSION IN SOUTHERN AFRICA**

ENTERPRISE PRODUCT PROFILE			
Company name	Montigny Investments		
Contact (Mr./Ms.)	Mr. N. Rijkenberg		
Title	Managing Director		
Mailing address	P.O. Box 86, Nhlalango		
Street address			
City	Nhlalango	Country	Swaziland
Telephone	(+268) 207 8619	E-mail	neal@realnet.co.sz
Telefax		Telex	
Type of business	<input checked="" type="checkbox"/> (X) Manufacturer/Producer <input type="checkbox"/> ( ) Merchant <input type="checkbox"/> ( ) Exporter		
Year of establishment		Number of employees	
Bank reference	First National Bank		
Countries Previously Exported to:	India: bark Europe: umbrellas		
PRODUCT PROFILE			
Products available for export			
HS Code	Description as detailed as possible		Quantity available per annum
44.01.10	Raw timber		5000 tons/month
44.07	Components (planks)		20 m <sup>3</sup>
44.03	Bark		60 tons/month
44.02	Charcoal		150 tons/month
44.03	Mining timber (packs)		1500 tons/month
44.04	Building/fencing poles		750 tons/month

**Description of the company**

**Descriptions of fruits**



The data was collected by conducting several interviews in order to show the characteristic of each species and people's favor.

### **1) *Peaches***

The Red Peaches are juicier, smoother, sweeter, softer and bigger than other peach species. It grows up quickly than others too. It takes 2 and half months to get ripen. The disadvantages of red peaches are that they need to be take care of carefully than other species, more water, more farm chemical (which is too expensive). The fruits are red color inside and often used for making jam.

The Yellow Peaches are less sweet and soft than Red peaches, a little smaller than red peaches, It takes 3 to 3 and a half months to get ripen.

The White peaches' sweet, soft, size and growing period are similar to yellow peaches. Just color is different, white inside.

(Peach trees are flowering in spring; the growing period is from flowering to get ripen)

### **2) *Avocados***

Big Avocados are tastier; it takes 5 months from blooming to harvest. Big avocados are easier to find in Zombodze than the small one.

Small Avocados have a 5 months' growing period.

### **3) *Bananas***

Big Bananas, people do not really like their taste, and the texture of it is hard comparing to smaller ones. Few people grow this type of banana.

Small Bananas are tastier, with a softer flesh. And also they produce a bigger amount of fruits than Big Bananas. Therefore people grow this kind of banana a lot for both own consumption and selling. The only problem is this kind of banana gets rotten very fast, so people may not preserve them for a long time.

### **4) *Mangos***

Mangos do not grow very well in Zombodze, partly because it is high field **(Height)**, they get rotten before they get ripen.

Yellow mango is introduced from the lower height area. Many local people like it very much. Because its' cheap, yellow mango is the best selling species even though it is less tasty than Fish mango.

Fish mango, very juicy and it does not have any fiber. Local people prefer it than yellow mango. But it is too expensive to be part of the daily diet.

#### **5) *Guavas***

Guavas grow well in Zombodze without any special attention. People like guavas a lot, most of the homesteads can (canning) guavas to preserve them for a long time.

Red guavas are nicer, juicier than the white one; that is why red guava is the dominant variety in the area.

## Diary

16/01/04 Day1(Friday):

2 hours journey

First impression after a tour by van: scattered and big area, some homesteads are more difficult than others to reach. Diversity in the landscape: low field – up hill (trees on the top). Nice welcome party (dance “Ummiso”). First contact with local people.

17/01 Day 2:

Questionnaire: very hot (sun burnt)

Spent in low field

Scarce fuel wood/ some fruits trees.

A lot of differences between homesteads: number of people, rich/poor (tv, electricity, tractor,...)

Difficulties to quantify fruits production

Mostly old people

18/01 Day 3:

Questionnaire:

Spend up hill: completely different, greener, closer to woodlots

Notice differences between time/price each homestead spend in collecting/ buying firewood (even neighbours)

Very hot

People willing to help but asking if they will get anything back from our project: hard to answer; explain it is an academic project...

19/01 Day 4:

Morning Interviews:

We tested our interview guide on one of the interpreter “Austin”. He said that some varieties of peaches are better than other but still he does not plant them in his homestead why?

We split and interviewed the agriculture officer of Zombodze: very educated person. Gave us interesting information about this new project about fruit trees and windbreak. But the project is too recent to be discussed further.

Afternoon: back to “centre”: Lian and I did PRA. Big argument with Siani, does not want to work for the last 2 days. Remained unsolved so far.

15h: 4 people went to collect fuelwood with a women (1h20 min) + interview. Exhausting day. Back to centre: combined info. With others: Shangé and interpreters very involved.

20/01 Day 5:

early morning, the whole group (even Siani) went out for a long walk to the plantation. On the edge of the forest we split in 3 groups and start conducting interviews. I was with Shangé and Austin and we asked the people who live next to the plantation. Land tenure issue has to be solved out.

Afternoon: interview with 2 guys who sell firewood. The business is expanding.

21/01 Day 6:

Work on PRA, 4 methods have been chosen. Information have been collected to local people and interpreters. Meeting with group: people think our project is taking shape.

22/01 Day 7:

Some people in the group think the project is getting too long: “always the same questions (Why not more trees?)” and firewood (the access) always the same answers. The scientists are tired of interviewing (social job) Trevor, Shangé went out to identify some trees. It’s raining very heavily. Andreas was with us this morning and proposed us to look at: “Why people do not join themselves and plant some wattle?”

Afternoon: I went out to the plantation of avocados with Austin. The guy told me avocados are a secondary business for him.

23/01 Day 8:

All sluse student deserved a day-off. We went to South Africa (except for Lian): boat trip, wild animals, a lot of fun... Evening: Jabu and I made a presentation of the project.

24/01 Day 9:

We were supposed to help SMART to plant trees. Nothing happen. Long day. We went out with Lian to interview a guy in zone 5 who gave us some very good information fruits/ wood. Football match at 5h00. Lost 5-4

25/01 Day 10:

lian is sick. With Jabu, Austin, Clement and Trevor we went to interview Neal’s father. The other side of the story concerning the people who live next to the plantation and more information about timber in Swaziland. Evening Party, few local people joined in.

26/01 Day 11:

we packed, said goodbye and left.

Lian's dairy

17<sup>th</sup> and 18<sup>th</sup> January

Deliver general questionnaires

19<sup>th</sup>

Interview two orchards, group meeting and design PRA method (select and begin to develop 4 PRA methods)

20<sup>th</sup>

Go to visit the big plantation on foot, interview the son of the manager who worked in the plantation and local community. Later go to interview fuel wood businessmen.

21<sup>th</sup>

Group meeting, work on PRA and collect information from local people and our interpreters. Make a plan for the future days.

22<sup>th</sup>

Go to interview 5 families for fruit trees and group meeting

23<sup>th</sup>

Holiday, other go to South Africa, I go to Marzini and have a good time

24<sup>th</sup>

Go to conduct 4 interviews of woodlots and did some job on computer, play football

25<sup>th</sup>

Go to interview woodlots in zone 8 and join the ceremony in church

26<sup>th</sup>

Stay at home in the morning because I am sick and went to the central village in the afternoon and finished 'Description of fruits'