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SLUSE report

Crop farming in Mpharane – constraints and opportunities for a more market-oriented production

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Abstract

The distribution of wealth in South Africa is still 20 years after the Apartheid highly uneven. Governmental initiatives such as land reforms have failed in trying to balance the inequality; especially in the former homelands still suffer from poverty.

The main objective of this report is to investigate why farmers are primarily producing to own consumption and what the constraints and possibilities are for a more market-oriented production. The research is carried out in Mpharane village in the former homeland placed in the Eastern Cape of South Africa.

During a two-week field trip to Mpharane village, empirical data was collected through both social science and national science methods.

Farming in Mpharane can be described as a low-input, subsistence farming system. The most important constraint identified for a more market oriented production was the low yield, this is due to both biophysical and socio-economic constraints which were found to be interrelated.

Key words: small-holder farming, South Africa, market-oriented production, subsistence farming

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Appendices

1 Introduction (ALL)

In South Africa the distribution of wealth is highly uneven, especially as a consequence of the Apartheid system, which ended in 1994. Poverty in South Africa is largely a rural phenomenon and approximately 70% of the rural population lives below the national poverty line (Hall 2004). Especially in the former homelands of apartheid, there is a high percentage of poverty. These areas are mainly characterized by small holder farming, where the majority primarily practices subsistence farming (Lahiff and Cousins 2005).

During and after the apartheid era several attempts have been made by the government to minimize the inequality and lower the level of poverty in rural areas. Land reforms have been suggested as a part of the solution to equalize the land distribution between black and white, however these have only had limited success (Hall 2004). 1.2 million black households have access to 17 million hectares in the former homelands which corresponds to 13% of total area of South Africa (Hall 2004, Mohamed 2000).

Small-scale farming is expected to play an important role in revitalizing the rural economy in South Africa (Freguin-Gresh et al. 2013) but the former homelands have instead of the intended increase in agricultural production seen a de-agreanisation (Mtero 2012).

There are various explanations as to why the role of agriculture has decreased in favour of other livelihood activities. A development towards diversification of livelihood strategies is seen (Alemu 2012), where agriculture no longer plays the only role, but together with other livelihood strategies are comprising the basis of the household (Hill et al. not published).

The government has then initiated programs to modernize agriculture and make production more market-oriented – an example of this is the Accelerated and Shared Growth Initiative for South Africa (AsgiSA) (Mtero 2012). The small-scale farmers are however still mainly practicing subsistence farming, where relative few products reach a market (Lahiff and Cousins 2005). A lot of different factors have been identified in the literature as constraints for increasing the production for the small-scale farmers in the previous homelands.

Small-scale farmers are very dependent on their local biophysical aspects such as soil type and climatic conditions, which are highly changeable and have a large influence on the yield (Fox & Rowntree 2000; Borggaard 2001). Further it is known that small-scale farming is a low input system (Snapp et al. 1998), which entails some constraints for the optimal plant growth and hence the yield (Husted & Jensen 2009).

The small-scale farmers also face a wide range of socio-economic constraints. Land access is often identified as an important constraint for crop farming in the former homelands (Lahiff and Cousins 2005; Adams et al. 2000; Freguin-Gresh et al. 2013; Senyolo et al 2009). All though rural inhabitants hold a Permit to Occupy (PTO) for the land they cultivate, this system doesn't secure a legal access comparable to the freehold access (Ntsebeza 2004:2). Instead most homelands have communal property and are ruled by tribal authorities, whose management can be questioned (Ntsebeza 2005, Bennet 2012).

Another identified socioeconomic constraint for farmers is lack of liquidity, which means that people do not have the means for investing in agriculture (Fenwick and Lyne 1999). Further the majority of the small-scale farmers are not able to get access to credit and hence do not have the opportunity to invest in their land (Ortmann & King 2007). Therefore many people from the rural areas are involved in saving activities

(Coetzee 1998).The role of savings groups and different forms of cooperatives are often discussed in literature in terms of their role played in developing the role of the small-scale farmers (Kruger 2010; Ortmann & King 2007). Lack of liquidity means that they cannot produce enough crops to get into market activities and play the intended role in revitalizing the rural South African economy.

All of the above biophysical and socioeconomic constraints are interrelated and affect why only a minor part of the small-scale farmers' yield reach a market. This report has empirical basis in field work carried out in the village of Mpharane in a former homeland of South Africa. It will investigate to which extend these constraints are appearing. The overall problem statement is;

Why do farmers in Mpharane mainly produce to own consumption and what are the constraints and opportunities for a more market-oriented production?

Based on the above points from literature, this will be investigated by conducting a series of research methods from both the natural sciences and the social sciences. Secondary literature will serve as a triangulation of our empirical data and a framework for the analysis. Primarily based on the above identified areas affecting small-scale farmers in rural South Africa, the following research questions have been chosen to support the problem statement;

- *What is the historical development in the use of outfields compared to the current use?*
- *What other income-related activities than crop farming do they have?*
- *What are the different agricultural practices in the village?*
- *How is the condition of the soil affecting crop farming?*
- *How does climate influence crop farming in Mpharane?*
- *What are the primary, biophysical factors affecting crop growth?*
- *What is the role of tenure rights and power structures in connection to outfields?*
- *What is the role of access to market in connection to farming outfields?*
- *What are the possibilities for financing crop farming?*

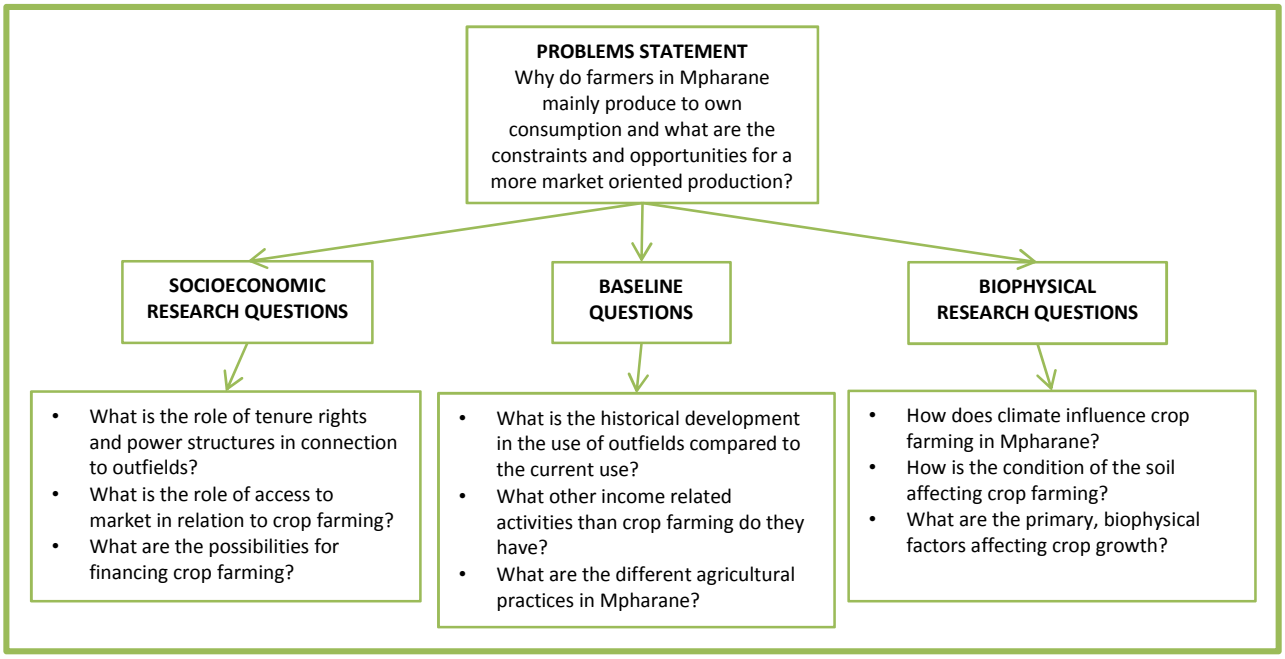

Figure 1 – Illustration of the problem statement and its underlying division of baseline, socioeconomic, and biophysical research questions.

1.1 Limitations

There are of course limitations to the extent of the report and therefor large commercial farms formerly owned by whites placed in Mpharane are not included in the research, since the focus is on small-scale farming. Furthermore issues of gender, workforce and migration are only limited touched upon. It is evident that keeping livestock also plays a prominent role in agricultural activities, but it is not within the scope of this report to consider that in broad terms.

1.2 Definitions

- Agriculture is defined as crop farming and a farmer is any person who is engaged in agriculture,
- Market-oriented production is production meant for sale and hence undertaken for profit,
- Livelihood strategies are defined as a households collected activities to improve the life situation for the total household,
- Subsistence farming is defined as a farming system where the yield primarily is used for the households own consumption for people and livestock, and
- Integrated farming is defined as a system where livestock and crop farming are interrelated.

1.3 Structure of the report

The first part of the report describes the different social science and natural science methods used. The short comings experienced with each method is also presented in this section in order to have an understanding of this before…

Section X initiates the analytical part of the report by using some of the empirical findings combined with literature to describe the local setting.

In section X to X the different constraints for a more market-oriented production is being analyzed by combining the different methods and (in some cases) triangulated with existing literature.

Before discussion the results of the analysis, reflections of the shortcommings and advatages of the used methods will be presented. This section leads up to the discussion where the findings from the analysis are combined in order to get an understanding of the interrelatedness of socioeconomic and biophysical constraints.

The report is ended with a conclusion and a reflection section in which suggestions to further research areas are being presented.

In Appendix 3 it is listed which empirical data is used in which sections of the report.

2 Methodology presentation and critics (ALL)

In order to answer the problem statement and the given research questions, different methods was used to gather and analyze data. The choices of methods have been elaborated before and during the fieldwork in line with the recipe from Mikkelsen (2005). From the beginning it has been planned to use quantitative and qualitative data as Murray & Overton (2003) describe. Some PRA methods were developed during the fieldwork, such as the seasonal calendar and mapping of use of maizefield/homegarden. Methods presented by Seleuer (1999) and Bech-Bruun (2013) have also been used to triangulate the gathered information and to engage in the more biophysical parts of the projects.

The following section will describe why these different methods were chosen as well as successful and less successful experiences of the methods.

2.1 Questionnaire: Random sampling

Being aware of the main strengths and weaknesses (Babbie 2010) the purpose with the surveys was to collect data in order to obtain a general picture of the ongoing crop farming. In total 19 questionnaires were carried out randomly at three different locations in Mpharane. The locations were chosen on the background of conversations with the translator and recorded with GPS as seen in figure 2.

The intention was to extract interesting profiles for in-depth interviews, but because none of the 19 from the questionnaires was engaged in crop farming, this idea was abandoned. The final questionnaire scheme is presented in appendix 4.

While conducting the random sampled questionnaire, the rule of choosing every third house, appeared to be a challenge in some cases because houses in Mpharane are scattered rather than placed straight along the road. This entailed that it was not possible to completely rule out subjective assessments.

The questionnaire survey often evolved into an in-depth interview if new relevant details came up. This also resulted in a broader understanding and some valuable additional comments which are used in the analysis.

2.2 Questionnaire: Snowball sampling

Because none of the randomly chosen participants in the questionnaire survey turned out to farm an outfield, this method was chosen to engage some crop farmers in Mpharane, and collect some important data about farming practices and strategies by also using question 11-28 in the questionnaire (see appendix 4). The first farmer was appointed by a key informant, and then the interviewed farmer recruited the next subject (Goodman 1961).

All of these questionnaire sessions turned into in-depth interviews where further information about farming practices was obtained. However, since we only conducted four of these interviews the data did not provide any quantifiable data. Instead, this method contributed with important data about various farming practices, having some farmers farming one outfield and a few farming several outfields.

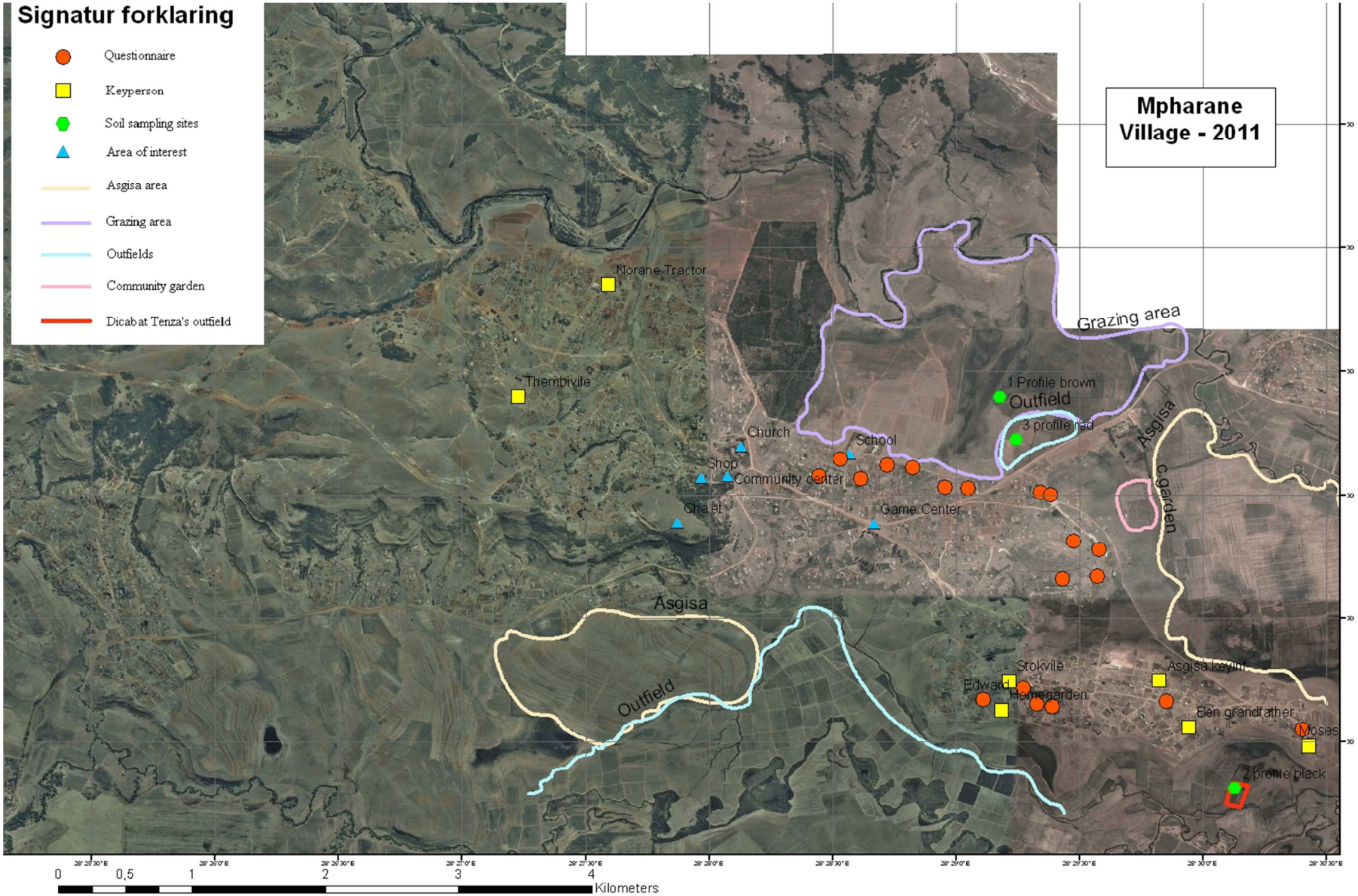

Figure 2: Map of Mpharane showing the households where questionnaires and interviews were done. The map also shows outfield areas and the location of soil samples

2.3 Semi structured interviews

Qualitative interviews were carried out with key informants and with local farmers appointed from the two questionnaire surveys, in order to get more detailed answers from the questionnaires and to triangulate some of the answers given (Gilham 2000). A semi structured interview was conducted with farmers to be able to illustrate and obtain insights about these farmers' lives and the constraints linked to different farming practices. Interviews with key informants as an extension officer supervisor, the chairman for the community garden project etc. were conducted to triangulate the answers from interviews with farmers and also to get some answers from another point of view. The outline for the interviews is presented in appendix 7 and 8.

It was encountered that interviews with too many participants could create a quite dull atmosphere. When separating in two smaller groups the interviews were carried out in a friendly atmosphere and gave more valuable information.

2.4 Transect walk in the village

A walk around the village the first day gave a first-hand impression of the farming practices (Seleuer 1999). It gave an insight to where the outfields planted with maize were and where the expected households with access land were located – and hence in which areas questionnaires could be conducted. During this walk it became clear that land changes were taking place to a large extend in Mpharane. When looking at the number of outfields at the map from 2008 and compared them to the current number of outfields it became clear that a decrease in cultivation of outfields had taken place.

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Besides noticing the decrease in outfields grown we also observed the conditions related to infrastructure and nutrient deficiency in crops.

2.5 Participatory techniques

Inspired by (Mikklsen 2005) a number of participatory rural appraisal (PRA) methods were carried out. At every questionnaire a ranking method was carried out in order to get an insight to the livelihood activities for the household. The aim was to see how high farming was ranked compared to other activities (pension, subsidies from family etc.). This method contributed with valuable insights all though in many cases it could have been benefitting to elaborate by asking more about the thoughts and perceptions of the different categories chosen in the ranking.

A seasonal calendar was drawn for a farmer with and without a tractor to see how a tractor could change the farming practice and the workload during the year. The seasonal calendar was also used to see when the farmer had income from selling commodities or income from other activities. This PRA method gave good insight to the constraints during the year. Since none in the research team had previous experience with conducting PRA methods it would probably have been a good idea to practice e.g. the seasonal

calendar beforehand with the translator. Something which impeded the situation was the timing for conducting the calendar. Since it was late afternoon the farmer who participated seemed tired which made it more difficult to engage him.

A wealth indicator was used at most interviews and questionnaires to understand if some answers were linked to a specific wealth, and if poor families had other constraints compared to wealthy families. Due to lack of communication, one part of the group did not do any wealth indicators on the questionnaire they collected. Therefore, this became a lesson of knowledge sharing and the importance of discussing the approach more thorough beforehand.

A historical timeline (Seleuer et al. 1999) was drawn together with a group of old farmers in the village. The object of the exercise was to enlighten our understanding of how the agricultural sector had developed during the last 30-40 years in Mpharane. Since our key informant who said he would participate did not show up we had to find three other participants very fast after the meeting. Three elderly men agreed to participate and the first part of the timeline went well. Unfortunately, the community hall closed which meant we had to find a new location. The biggest obstacle, however, was not the moving of location; instead it was the issue of the men getting hungry, which meant that we had to shorten the discussions.

2.6 Participation in community meetings

We went to the weekly debriefing between community, subheadmen and headman. The aim was to gain inside knowledge of actual issues in the village if any. Another objective was to interact with the headman and sub-headmen to get important information about their perception regarding the use of land issues.

We attended a meeting organized by the Ward Councilor about the new agriculture project “zero under copping” (direct translated by translator), as we learned about this project from a conversation with a farmer. The objective was to triangulate the information about the project given by the farmer, and to gain extra knowledge.

At the latter meeting it became clear that the translator was engaged in the community and had an opinion about the things going on. He interfered in the plenum discussion, which impeded the possibility to translate simultaneously.

2.7 Informal conversations

Informal conversations were carried out with different persons, especially in the beginning to get an overview of the different problems regarding farming compared to what we prepared from home. These conversations helped in refining the problem statements of the project before the start.

Informal conversations were also used to triangulate. For example with Tsepo Leshotu (member of Mehloding Community Tourism Trust) in order to triangulate and verify the historical timeline (Seleuer et. al 1999). During this conversation it became clear that Tsebo mainly was considering the information already gathered in the timeline, which meant that we did not really get to know whether the developed timeline was missing major events.

Two successful conversation with the Ward Councilor were conducted in an informal way, e.g. by taking advantage of the agricultural meeting being late.

2.8 GPS georeferencing

Geographical positioning systems were used to record the locations of households participating in questionnaires and key persons. The different soil type areas were also located for triangulation with the interviews (see the map with the GPS-marks on Figure 2).

Sometimes difficulties appeared due to the GPS taking a long time to calibrate, we became aware and acted attentive to the problem.

2.9 Soil sampling

To be able to triangulate and quantify the information from the interviews and questionnaires, soil analysis were carried out. The main purpose was to determine the soil texture, color, soil bulk density and pH. The sampling took place in three different areas of Mpharana, hence in the red, brown and black soil area. The outfields belonged to people who participated in the interview survey.

Soil pH value was determined in order to investigate the soil acidity and the availability of nutrients in the soil (Bech-Bruun 2013).

Phosphorus, Potassium and Nitrogen abundance in soil where not measured as the only available technique was a quite uncertain method which we were urged not to use (Oelofse 2013).

C:N Ratio was tried determined in the lab, but the IR-MS spectroscope broke down just before the samples were ready. The institute was not able to find a replacement, so we had to give up this technique (Bech-Bruun 2013).

2 samples were taken from maize fields and one was taken from a grazing area. Preferably these should all have been taken from arable land. Also the samples were not randomly selected.

Soil samples are conducted as described in appendix 10.

2.10 Use of literature

Before the fieldwork our search of literature was guided by general themes and conflicts about small-scale farming in the South African context. This shaped our research questions and framework for our data collection.

After returning a new literature search was made to look for evidence supporting empirical examples and practices found in Mpharane. During the analysis the literature will serve as a triangulation of the empirical data and a framework for the analysis. Overall, the choice of literature in this report affects the approach and we are aware that other types of academic articles could have resulted in a different perspective.

3 Local setting (DITLEV, Maja, Leneisja, Line, Morten)

Mpharane Village is located in the local municipality of Matatiele in the Eastern Cape province of South Africa. This local municipality is a part of Alfred Nzo District Municipality (one of 6 district municipalities in the Eastern Cape Province (Matatiele n.d). Until 1994 it was situated in the former homeland of Transkei and this is still one of the poorest areas of South Africa (Perrett 2002). Some very important aspects of Mpharane's history, especially related to farming, can be seen on the timeline (Figure 3). Furthermore, in the last few years, the area of cropland has been reduced due to conversion to grazing areas.

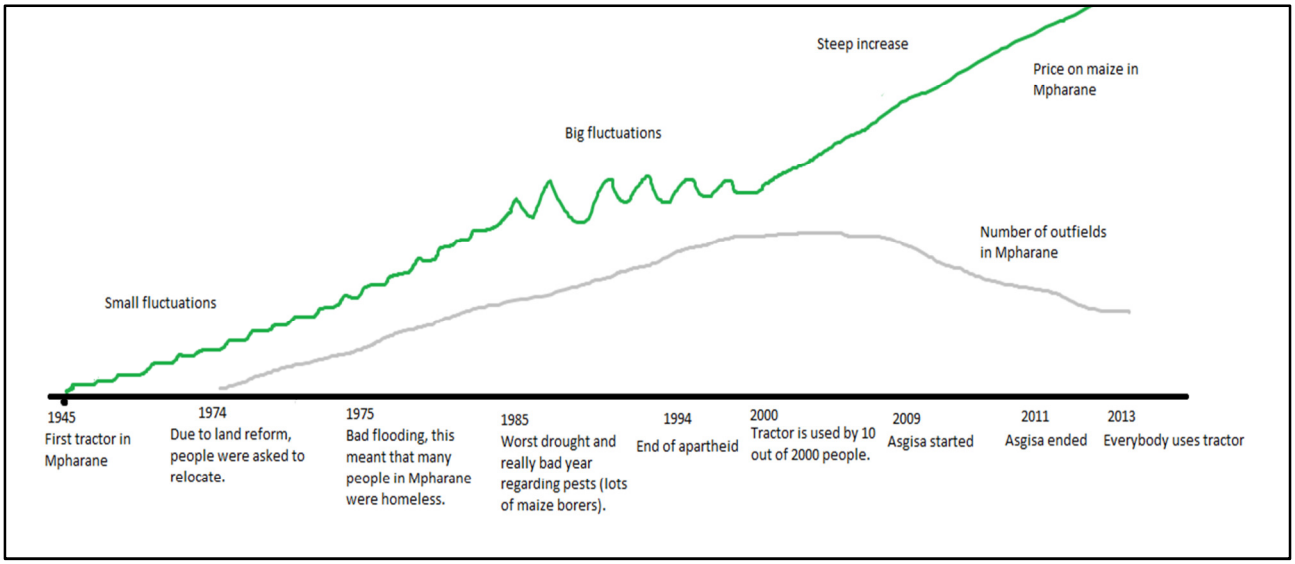


Figure 3: The timeline showing the major events in Mpharane since 1945 (PRA timeline focus group)

Mpharane is located in an area under a tribal system. This is a common situation in the Eastern Cape having the highest percentage of people living under the tribal authorities (SAnews 2013).

The authority structures of Mpharane are dual though because there are also governmental authorities (Hill et al. not published). This creates confusion among the villagers in regards to who has which field of responsibility. The situation can be seen on Figure 4.

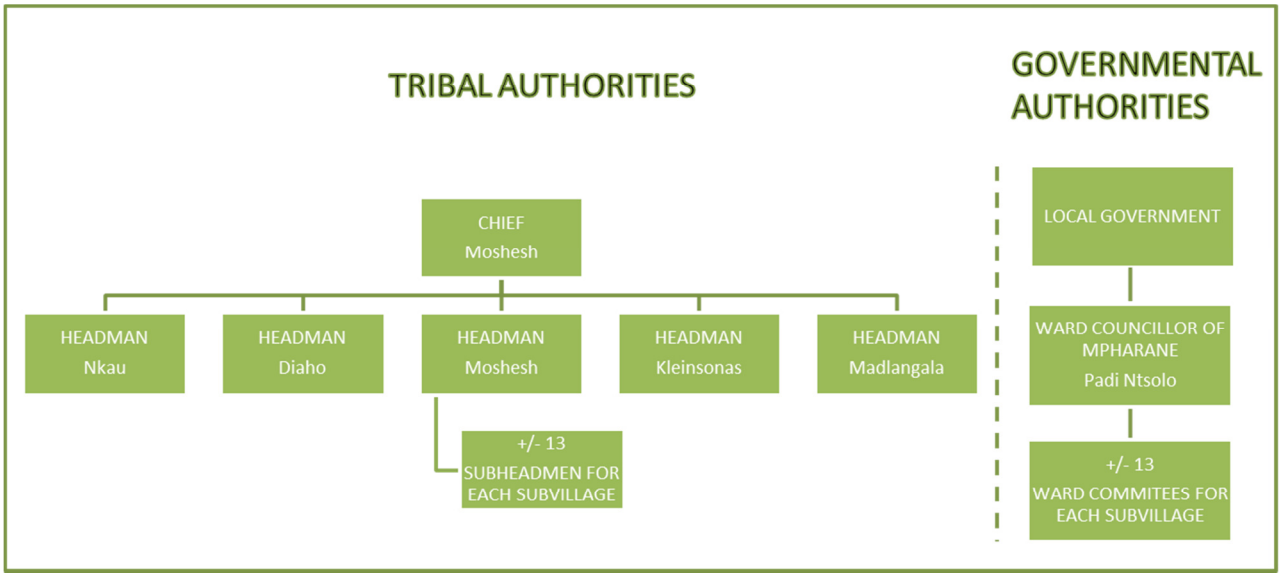


Figure 4: Overview of the dual power structure showing both the tribal authorities and the governmental authorities (Tsebo and Innocent, personal communication 2013)

The tribal positions are inherited from family. They are in charge of e.g. land assess, changing local rules and also punishing people internally in the villages (Headman, personal communication).

The governmental positions are on the other hand acquired by election and their function is to represent the people's interest. As the Ward Councilor puts it *"I am the mouth of the community"* (Ward councilor, personal communication). They have no power (Capetown 2012).

3.1 Demography

In total, there is a population of over 1500 households in Mpharane. Among grownups, there is a quite uneven gender distribution – about 50% more women than men (Prag & Birch-Thomsen 2013). The situation can be seen on Figure 5. The reason for this seems to be because men work outside the village (Matatiele 1 n.d.)

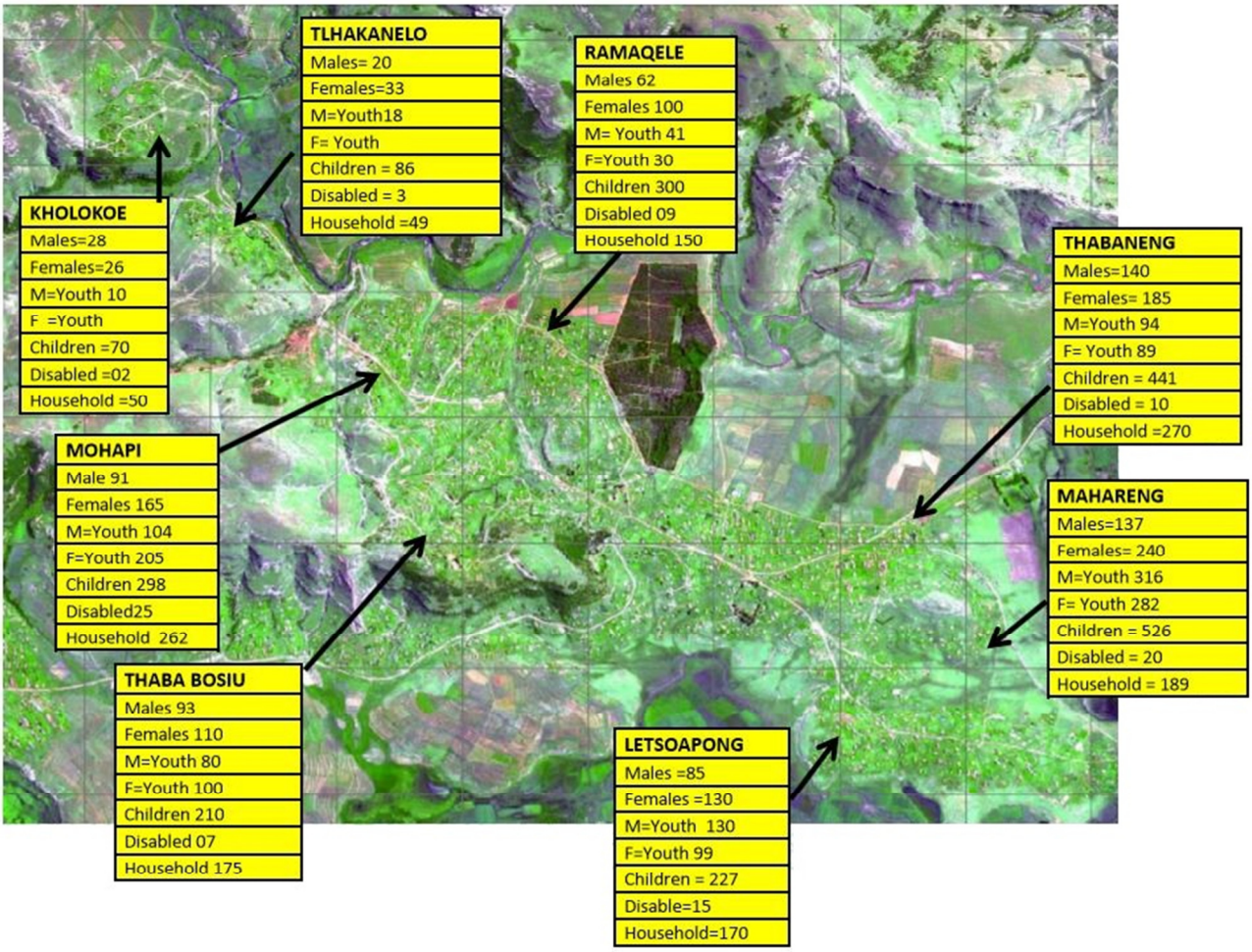


Figure 5: Overview of Mparane. Note that not all 13 subvillages are present (Prag & Birch-Thomsen, 2013)

The unemployment rate in the municipality is very high – 55.7 % in 2008. The working force is most often employed within community services (46.7 %), while employment within agriculture accounts for 11 % (Matatiele 1 n.d.).

6.4 % of the population in Matatiele municipality is illiterate (Matatiele 1 n.d.).

3.2 Climate

According to Koppen climate classification, Mpharane fall into a C climate, which indicates a moist climate. Justification for this is included under the appendix 10. Due to its placement in the atmospheric system though, South Africa has a high variability in rainfall which leads to periods of both flooding and drought (Fox & Rowntree 2000).

The precipitation data can be seen on Figure 6. The other climate data can be found under appendix 11.

Compared to a South African context, Mpharane is situated in an area of high biological productivity and also high mean annual rain fall (Fox & Rowntree 2000). The last is illustrated below on Figure 7.

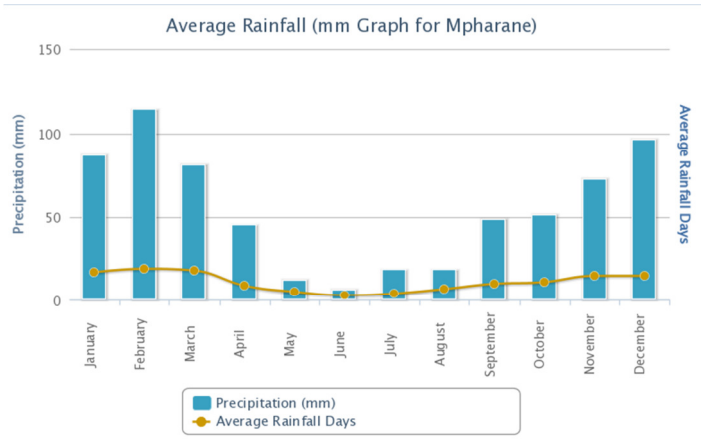


Figure 6: Precipitation data for Mpharane (World weather online 2013)

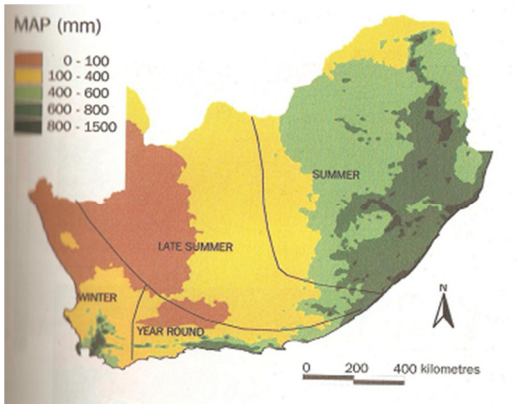


Figure 7: Mean annual precipitation in South Africa (Fox & Rowntree 2000)

4 Subsistence farming and Livelihood Diversification (LINE, LENEISJA, Maja, Ditlev, Morten)

To reach an understanding of how important crop farming is for households in Mpharane, this section examines the farming system and the diversity of livelihood activities for households.

As in most farming systems in the former homelands farming in Mpharane is based on subsistence farming (Lahiff & Cousins 2005). This implies that farming mainly consists of self-sufficiency production of commodities to household consumption and not with the main purpose for trading (Lahiff & Cousins 2005). This is also there case in Mpharane and the Ward Councilor describes the farming system as

> *Many do it the African way, crop farming is for them to eat and feeding the animals*
>
> **Padi Ntsolo, Ward Councilor, personal communication**

Further he explains how crop farming in the village is not seen as an employment or something you earn good money on. He thinks that the way to change this is to make the villagers businessmen. Another sign that farming is seen more as a way of getting food, more than a business, is the high extend to which people are giving away maize to family and friends instead of selling it.

This is also evident when looking at the households farming an outfield, where all respondents are using the yield for household consumption as shown in Table 1.

Table 1: Use of yield from outfields by farmers. All are using the yield for human consumption, 5 for livestock and 5 farmers sell products only if they have a surplus

Use of farming products:	Human consumption	Livestock	Selling only if surplus
Matlatseletso Taoana	X	x	x
Nomnyamezeli Tenza	X		
Mamotsekuwa Mosehle	X		
Moses Golo	X	x	x
Norake Ntlhanakoe	X	x	x
Ditabat Tenza	X	x	x
Thembivile Mbanga	X	x	x

Another characteristic for subsistence farming is that it is a low input system with organic fertilizer being the main input (Snapp *et. al.* 1998; Heisey and Mwangi 1996). In Mpharane this is also the case in that there is a close connection between the farming of crops and keeping livestock. One farmer explained the connection of crop farming and livestock as such:

> *The livestock is dependent on food from the maize field. Therefore there is a linkage between crop farming and having livestock*
>
> **Ben Tenza, personal conversation**

When asked about the relationship between crop farming and livestock, people explained how livestock was taken to the fields after harvesting both with the advantage of good grazing for the animals, but also as a means of fertilizing the soil (seasonal calendars). This is an example of an integrated farming strategy

This is also supported by the fact that the biggest farmers did not make their money from farming, but from other non-farm activities. Even now when they have the possibility to invest in farming, they are ranking for example their tractor the highest because it brings other incomes from for example fetching wood and water and from ploughing other peoples' fields (see diagram 1). This also corresponds to other findings on the relationship between farming and non-farm activities (Alemu 2012).

Another factor that is affecting the role of farming to households is the whole attitude towards farming. Villagers doing small-scale agriculture do not see themselves as farmers in the conventional sense (Lahiff & Cousins 2005). This was also evident in Mpharane, where the term "farmer" was used for people farming the big former white commercial farms.

To get an idea of the importance of crop farming to the households, a ranking session was done in which respondents were asked to rank livelihood activities according to their importance to the households.The results are shown in below Figure 8 and Figure 9.

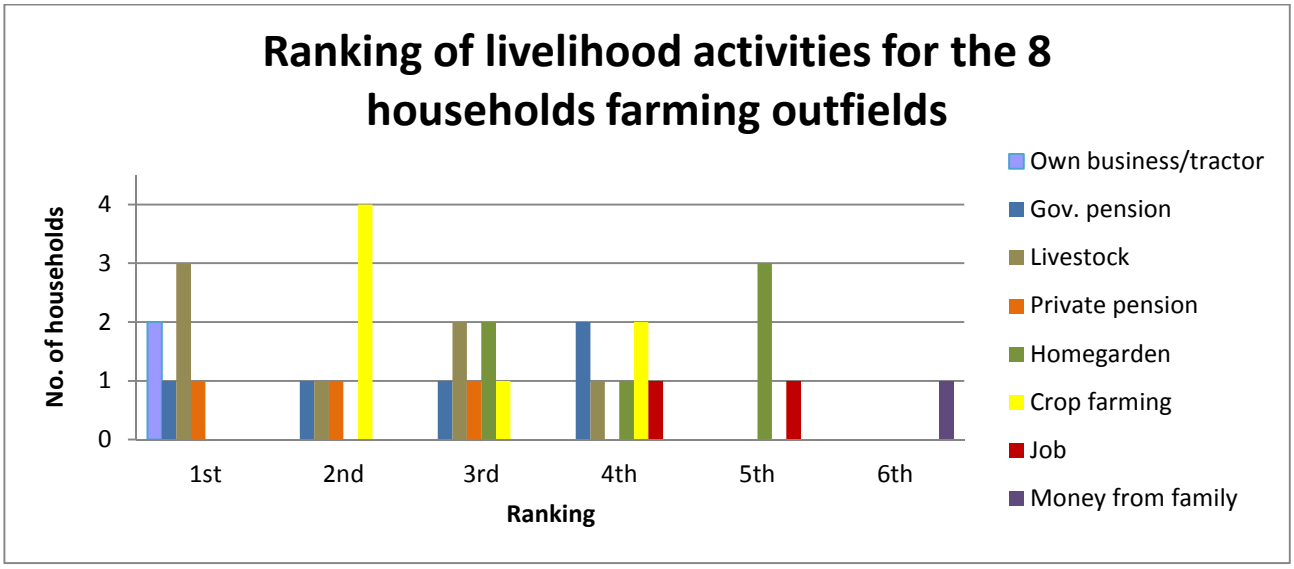


Figure 8: The figure shows the amount of households' ranking of each livelihood activity. These households are all farming an outfield. Noone is ranking crop farming 1st, whereas 4 are ranking it 2nd

The ranking exercise and the conversations connected to it show that households are not investing everything in one source of income. People were often in doubt which was most important, which shows that households are diversifying their livelihood activities. This is also a trend which is generally seen in South Africa, that people to a larger extend are diversifying their livelihood strategies (Mtero 2012; Hill et al. not published).

In general the role of farming to households is not very big compared to other activities. Several respondents mention climatic events as the reason why they are reluctant to invest in farming, which could be a reason why the household is not solely investing in farming activities.

The ranking exercise was also done with the respondents to the 19 questionnaires. Figure 9 shows the results.

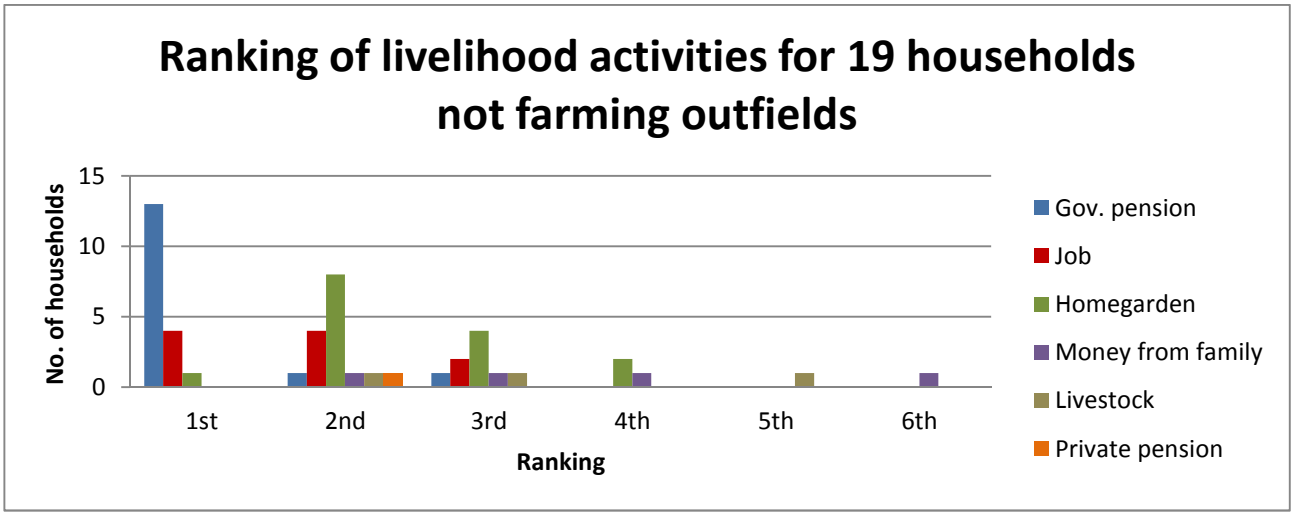


Figure 9: The figure shows the amount of households' ranking of each livelihood activity. These households are all farming an outfield

The two tables show that the yield from homegarden is important to the households regardless if an outfield is cultivated since 22 out of 27 have ranked homegarden as a livelihood activity, which is more than any other. It is especially important to households that are not farming an outfield since it is listed as the 2nd most important activity by 8 out of 19 questionnaire respondents (see figure 1 in box 5 which shows the ranking of homegarden). Most respondents said that they used the yield from the homegarden for household consumption. As one respondent said *"homegarden is for the children only"* (Nomthetheleli Tekete, interview).Implying that the yield for the homegarden was meant for the family to eat, which is also showing that cultivation in Mpharane is mainly for self-sufficiency.

The tables also show that people who are farming an outfield in general has more livelihood activites than people who are not farming an outfield. The ones who are not farming, rarely have more than 3 different livelihood activities, whereas 5 of the 8 who are farming has 5 or more livelihood activities.

The ranking of livelihood activities also show that governmental grants, such as old age grants, child grants and disability grants, are important incomes to the livelihood. In both groups of respondents the grants are ranked high. This is a stable income, which comes every month and thus people can count on getting money every month. Other empirical findings also find that these governmental grants are very important to the households of villages in the former homeland of Transkei (Mtero 2012).

This is also evident for one of the respondents, Matlatseletso Taoana, who has both an outfield and a homegarden, from which she sells products. Even though she has other income possibilities she still places her pensions first (see Table 2), because as she says

Private pensions we get every month, maize and turnip is only seasonal

Matlatseletso Taoana, personal communication

Her ranking is seen in Table 2. The reason for ranking private pension higher than governmental pension, even though governmental pension is higher (see Figure 10) , is that she will continue getting the private

pension whereas the governmental pension in the form of child support will stop when the children grow up.

Table 2 – Ranking of activities by Matlatseletso Taoana

Ranking	Activity
1st	Private pension
2nd	Gov. pension
3rd	Livestock
4th	Maize field
5th	Homegarden
6th	Money from family

Figure 10 shows how Matlatseletso Taoana is placing her incomes for the year. It shows how the two pensions run through the year and how incomes from crops are only in some months. According to answers from interviews and questionnaires this is representative for most households in the survey.

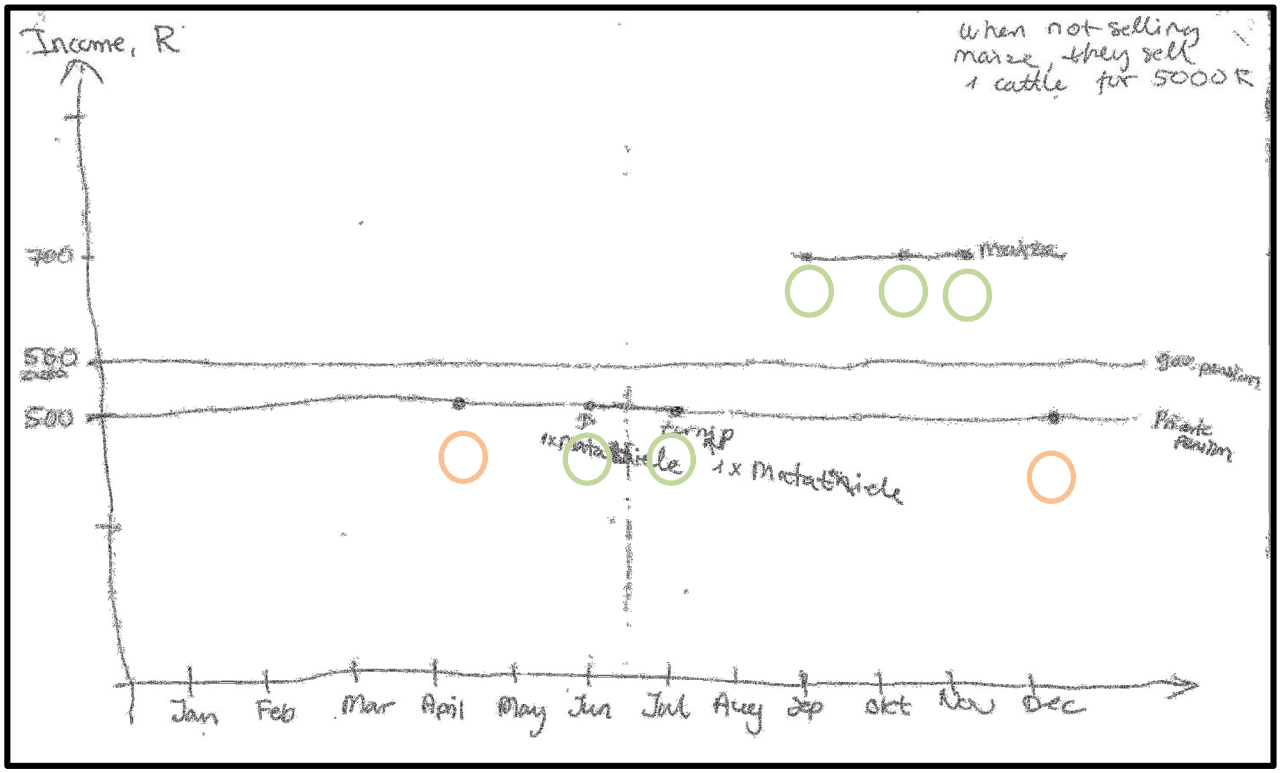


Figure 10 – income graph, green circles represent income from crops, orange circles represent money from family, the two black lines represent governmental pensions and private pensions respectively (Matlatseletso Taoana)

The conclusion from the ranking session is that the household income comes from various sources and that few people are basing their livelihood on outfields and instead are engaged in various income activities. Although the yield is used for household and livestock consumption, people are still valuing stable incomes higher. This is also shown in other surveys done in the area, which shows that the households are involved in multiple and complex livelihood strategies, combining agricultural and non-agricultural activities for sustaining their livelihoods (Mtero 2012, Hill et al. not published).

5 Agricultural Development projects (LINE, Leneisja, Maja, Morten, Ditlev)

Since the Apartheid Era, the South African Government has tried to reverse the deagrarianisation in the former homelands by introducing "modern" farming techniques and agribusiness principles (Mtero 2012). In 2003 the Massive Food Production Programme (MFPP) was introduced as part of a strategy to create food security in the Eastern Cape. The programme however was a failure to many farmers, since they could not pay back the loans provided by the programme to kick start their small-scale farming (Mtero 2012). In 2010 the Eastern Cape provincial government launched the Accelerated and Shared Growth Initiative of South Africa (AsgiSA), which is part of a strategy to halve poverty by 2014 (AsgiSA 2011; AsgiSA 2006).

5.1 AsgiSA

The empirical findings from Mpharane show that the initiative is a form of contract farming, where private contractors were hired by the Department of Agriculture to farm the land. It required villagers to bring their arable fields together and have them cultivated by the AsgiSA contractors. The villagers are not participating in any part of the cultivation, but receive 10 % of the gross income in return. This is also confirmed by an evaluation of the programme from 2012 (Mtero 2012).

AsgiSA was the first agricultural project in Mpharane. It was introduced to the farmers by the ward councilor, who also participated in allocating an area for the project (Ben Tenza, informal conversation).

Picture 1 – Area map with indicators of soil type and areas used by AsgiSA

The area east of Mpharane was chosen, since it avoids the perceived bad red soil north of the village. The owners of the outfields in the allocated areas were asked to give their fields to AsgiSA and everyone signed the agreement. Of them four farmers chose to farm their fields themselves, since they either had their own tractor or did not like AsgiSA to apply manure to their fields with the fear of it changing the soil.

AsgiSA ran for two years in Mpharane although it was agreed to run for 5 years. In the third year AsgiSA did not come to plough and it was by then too late for many farmers to plough themselves, since they had not saved money for ploughing. When asked about their opinion about AsgiSA, the majority of the respondents say the same thing

The community was happy, but the owners of the fields were crying

Respondents to questionnaires/interviews

Box 1 shows the good and bad things about AsgiSA as perceived by a participant in AsgiSA (Caswell Tenza) and by the larger community.

Good things about AsgiSA	Bad things about AsgiSA
According to key informant Caswell Tenza when asked to mention 3 good and 3 bad things about AsgiSA	
Animals can eat maize from the fields after harvesting during the winter	No fencing of the fields so livestock went in and ate some of the maize
You can earn some money without doing anything	They did not inform people that they were leaving so people did not have time or savings to plough themselves when they found out in December
It kept the soil busy	
According to the community, from questionnaires and interviews	
Good for the community	Bad for the owners
Community can pick maize left overs after harvesting	90 % is too much
Opportunity for people who cannot afford to plough themselves	Confusion in understanding what 10 % is among villagers
	No involvement of local people
	No farming education for children

Box 1 - Good and bad things about AsgiSA collected from interviews and questionnaires done in Mpharane, March 2013

This shows how it is important to create a sense of ownership when implementing development projects, which is also the focus of Robert Chambers' works with PRA. The aim of PRA is to make the local people center of the development, because they have the local knowledge and they know best their way of life (Parnwell 2006). AsgiSA did not involve the local people and their knowledge in the project. As one of the farmers say, they did not educate the children, they just came and did all the work. There was no knowledge sharing with AsgiSA.

> *Because of the way they came. In stead of working together and training the children, but they only gave them 500 Rand … want the children to have a good future, they should learn to farm and not only be eating*
>
> **Moses Golo, personal conversation**

Another big issue that was mentioned every time the word AsgiSA came up was the fact that farmers were paid less than expected. The agreement was 10 %, but it seems like few farmers understood the concept of percentage and were disappointed with the low payment. This also comes down to the knowledge sharing and information between villagers and project implementers.

> *AsgiSA was a good project, but they did not explain it properly to the people*
>
> **Caswell Tenza, personal conversation**

Other studies have similar findings from doing research in the AsgiSA scheme in Eastern Cape. Mtero (2012) found that people were not involved in the decision making process and hence they felt disempowered. Mtero (2012) also emphasize that farmers in AsgiSA did not gain any knowledge and did not learn how to farm.

5.2 The new Agriculture project – zero undercoping project.

In the beginning of 2013 a new Agricultural Project was introduced to Mpharane by the Agricultural Department. In this project the farmers will be required to pay 1800R and the Department of Agriculture

will pay the difference in cost, which is approximately 7000R. The project will then do all the cultivation and the farmers will keep the harvest.

> *The government is serious about fighting poverty, so if people cant till the land, it is a problem. We are saying to them you must get into business – you must uset his land productively. By the end of the day all land should be used effectively for the community*
>
> **Ward Councillor, personal conversation**

The Ward Councillor of Mpharane sees this project as an opportunity for the farmers to get to plough their land. When it comes to financing the 1800R, which is a lot of money for a household in Mpharane, the ward councillor suggests people to come together in cooperatives and share the costs and the yield. In this way the ward councillor can encourage land changes, that can increase the use of the arable land around Mpharane which is currently left in fallow, and as he says himself:

> *We try to come up with changes which benefit everyone, not only those with land. The government is encouraging people to work together*
>
> **Ward Councillor, personal conversation**

At the community meeting about the Agriculture Project on March 7th, it was pointed out by the Ward Councilor that too few people had shown up. It seems there is a lack of communication to the villagers.

5.3 Constraints and opportunities

The AsgiSA-project was as mentioned a part of the government's goal of halving poverty by 2014, but it did not engage people in developing their own area – and in a society centered around the local community, such a project cannot avoid challenges. The New Agriculture project is risking to face the same challenges. At the community meeting about the project, the participants expressed worries about the methods of the project and they feared that the people running the project would escape. Again the participants of the project has not been involved in the development of the project, which according to Chambers (Parnwell 2006) is important for people to be engaged and the project to succeed. On the other hand the project gives an opportunity to the farmers, who would like to start a farming business.

If it is to succeed and not leave the farmers in debt as the MFPP did, it has to come with counseling on how to run a business and create a surplus – which is also sought after by the farmers asked in this survey.

6 Environmental constrains for crop production

In this section the environmental conditions that are the biggest constraints to a more efficient marked oriented production will be presented.

6.1 Climatic constraints in Mpharane (DITLEV, Morten, Maja, Line, Leneisja)

Even though Mpharane has a moist climate, the variability of the climate leads to both periods of flooding and drought – something that was visible from our timeline interview. Climate has a big influence on farming in Mpharane and bad weather can be a huge constrain for yields (Interview with farmer with 6 outfield). In this chapter we will describe the climatic problems that have the biggest impact on agriculture in Mpharane.

6.1.1 Drought

If there is not sufficient water available for the plants, this will restrict plant growth. According to local people drought is a serious problem, the second biggest constrain after flooding (Norake Ntlhanakoe, personal communication). In both 2012 and 2013, bad droughts were the reason why Mpharane had a bad harvest. The Chairman of the Community Garden explained that the community garden is the only place in the village that had irrigation systems in place.

6.1.2 Flooding

Flooding is listed by many people as an even bigger constrain than drought. Waterlogging causes extensive damage to maize and according to Ditabat Tenza, flooding is an important reason why many people don't cultivate their outfields. According to the Chairman of the Community Garden drainage systems do not exist in the village and flooding of fields is therefore a big risk to agricultural production. This is especially the case for the clayey soil in the bottom of the valley, which we will explain deeper under soil properties.

6.1.3 Hail storms

Bordering Lesotho, Mpharane is located in one of the worst locations regarding hailstorms in Africa. This area has an average of 8 hailstorms a year which will occur through the period from October to December (Buckle 1996). A few people list hail as a big threat to crops due to physical damage of the crop canopy but not nearly as many as flooding and drought.

6.2 Constraints related to soil conditions in Mpharane (DITLEV, Morten, Maja, Line, Leneisja)

This section will investigate the soil variation in the area and identify the most significant factors and constraints affecting a more high-yielding crop production in Mpharane

According to the village people there seemed to be 3 major soil types in the area. The different soil types are all listed in Table 3, together with physical parameters. A large variation was concluded on behalf of the laboratory experiments carried out.

Table 3 Soil properties in the area of Mpharane

	Red soil	Brown soil	Black soil
Soil type	Oxisol	Alfisol	Vertisol
Local's impression	Low fertile	Fertile	High fertile
Texture (FAO)	SL / L	SIL	CL / HC

Soil bulk density	1,6 – 1,7	1,5 – 1,7	1,1
pH (log([aH$^+$])	4,8 – 5,2	5,0 – 5,7	6,7 – 7,0
Color	10R3 – 6[1]	7,5YR – 3,3	5,5Y – 1

For the brown and red soil, the soil density is high. (in one case higher than 1.7 g/cm^3). This will restrict root development.

The lab analysis showed a great diversity in soil pH in Mpharane. The soil pH varied between 4,8 to 7,0. Nutrient availability is correlated with soil pH, and the lower pH in soil (starting from pH 5.5), the less available are the important plant nutrients, Ca, Mg, K and P. Bacterial and earthworm activity is also reduced meaning less available nutrients and less good soil structure (Borggaard 2001; Brady & Weil 2002). pH was found lower than optimal in both the brown and the red soil. Optimally pH in these soils should be 6-7 (Husted & Jensen 2009).

The problem for the oxisol is also the age of the soil. There is almost no weatherable nutrients left in the soil, for instance iron, which will be discussed later. Even though there is clay in the soil this clay has a low ability to retain and release nutrients (Borggaard 2001). It was the general conviction among the farmers that the red and brown soil had to be fertilized with artificial fertilizer or Kraal manure. Depending on type fertilizer, some fertilizer can have an acidic effect in soil, why the soil must be limed between years. This seems to be the explanation for the low pH values in these two soil types.

The black soil had a very high clay content leaving the soil aggregates very fragile depending on the soil water content. This means that when the clay soil is dry the cohesion will increase and thereby leave soil almost impossible to till. Also soils with high clay content are more prone to water logging due to their slower drainage. In our sample we reached free water at a depth of 70 cm. On the other hand, clay soils doesn't necessarily contain more plant available water than a more sandy soil, why plants might be water stressed even though there's still water in the soil (Jensen & Jensen 2001).

The bed rock is also located in very shallow depth at some places. In the brown field the bedrock was encountered in 70 cm depth. This will stop the root development completely.

The villagers are faced with different challenges and constrains for a more efficient crop production, both in terms of climate and the available soils in Mpharane. The worst climatic constrains are flooding and drought, where flooding seems to be the worst. Hail seems to be a lesser problem. Flooding is especially a problem on the fertile black soil. For the other soil types the problems are also nutrient related.

6.3 Farming practices in Mpharane (MORTEN, Line, Ditlev, Maja, Leneisja)

A farming practice determines the physical way a farmer cultivates his field. Farming practices can vary a lot between farmers in the same area, but the farming practice can also vary between different years for the same farmer. In general monocropping were used as strategy so no one utilized possible benefits of intercropping in a low input farming system (Mukhala et al. 1999). Basically, two farming practices seem to be recurring when an outfield is cultivated by crop farmers in the area of Mpharane – one practice for farmers who owned a tractor and one strategy for farmers who did not own a tractor.

[1] Colour codes from Munsell (1994)

Farmers who did not own a tractor hires a contractor to plough the field, as the majority of the farmers thought ploughing with oxen were time consuming. The harrowing and planting was done mostly done with oxen, as hiring the contractor for these tasks was too expensive. Weed control was carried out manual as inter-row cultivation with tractor was too expensive. Grain yield was harvested with manual labour and the bulk yield was either carried away or transported with oxen. One of the biggest constraints to this practice was some farmers had their oxen stolen from them, by the inhabitants from Lesotho, and could not afford to buy new oxen, and some farmers had to give up farming in the outfield because lack of traction.

Farmers who owned a tractor had a cheaper cost to soil preparation, and used the tractor for ploughing, harrowing, planting and weed cultivation. One farmer mentioned that because he owned a tractor he could cultivate the field just after the livestock had grazed the field and thereby have a more successful weed-control[2]. Common for all tractor owners was that they had managed to save some money from working in non-farming industries to clear the payment on the tractor. The main purpose with the tractor was not farming but entrepreneurship, as the tractor was used to transport timber and water which was sold to the people of Mpharane. Other was paid to transport sand and gravel to the maintaining of the public roads.

From the seasonal calendar created by two farmers, one with and one without a tractor, it shows that there was a different in the weed management. The farmer without a tractor spent 4 months weeding and the farmer with spent 3 monts. This could indicate that the farmer with the tractor had a lower weed infestation because he ploughed the field twice compared to the farmer without a tractor.

Money seems to be the reason for choosing farming practice. One farmer was interested in weed cultivation after the grazing of his outfield, but his financial situation did not allow it. Surely successful weed cultivation could have increased the outfield yield by reducing field weed infestation, which is why liquidity is the most dominating factor when choosing farming practice. Other farmers did not have the liquidity to rent a contractor to plough the field and had to give up farming.

7 Box 2: Tractor Association

The Tractor Association was founded i 2007 as an insurance company for people who owned a tractor. The idea was that members paid a joining and a monthly fee to the association, and in case need repairs, than members could loan money from the association to cover the expenses, and pay the money back over a period. Currently 22 farmers are members of the Tractor Association. The joining fee is R300 and the monthly fee is R20.

The tractor was introduced in Mpharane in 1972 and was a common farm implement in 1983-1984. Owning a tractor can result in large mechanic bills for famers who was already is under an economic pressure. The founding of the tractor association was a helping hand to farmers to find the money to cover mechanical expenses to tractor operations.

The Tractor association is a saving group which also function as a farming network between the members who farms an outfield. Knowledge exchange is among other things the agenda in the association.

Picture XX: Ditabat Tenza (left) who was a member of the tractor association.

Picture XX: The standard plough which is the most popular implement to be pulled by tractor

7.1.1 Acces to agricultural advisory

The Department of Agriculture, Forestry & Fisheries, Republic of South Africa offers free advisory to subsistent farmers. Agricultural Extension Officers are intermediaries between research and farmers in SA. They operate as facilitators and communicators, helping farmers in their decision-making and ensuring that appropriate knowledge is implemented to obtain the best results. The farmer contacts the Ward councilor, who request the Extension Officer. Despite the agricultural advising system, agricultural advisory seemed to be a limiting factor for some of the farmers. One farmer mentioned that he would be interested in advice regarding crop protection, but he did not know how to acces the advice. Another farmer was interested in soil tillage strategies. Two homegarden owners mentioned that he was facing a huge grass weed infestation. None of these knew how to get rid of the weed and could not crop their homegarden. Two of the interviewed persons had an agricultural education, otherwise farming knowledge was passed on from father to son. So even though the advisory service was located in Matatiele, it seemed like extension officers did no cover the Mpharane area sufficiently and some farmers actually wanted advisory in attempt to raise their yields.

Picture 2: Morten and Ditabat Tenza discussing maize aphids and their potential impact on maize crop. Tenza was really interested in the advices he received as he sought advisory service.

8 Crop production in Mpharane (MORTEN, Ditlev, Maja, Leneisja, Line)

Farmers in Mpharane grew different crops in their outfields, among the crops were maize, sorghum, beans and potatoes. The most common crop to be grown was maize. Different kinds of maize served different purposes. Some farmers did only grow yellow flat or dent maize for livestock feed and other grew white or yellow maize for milling to serve human consumption. A common thing for couple of the interviewed farmers was that they sold some of the maize to other people of Mpharane if they had a good. The maize yield in the outfields varied in good years between 50-70 80 kg. bags and in poor years between 10-20 80 kg. bags.

The farming strategy varied between the different soil types in the area. The red soil was always applied artificial NPK fertilizer, or Kraal manure, otherwise it would not yield properly, due to the fact that the soil was very poor in nutrients. The black soil was not fertilized, as the common conviction was that black soil was very rich in nutrients, so nutrient input was not needed on these soil types. None of the interviewed farmer had done any soil sampling in their outfield, as it was common knowledge that the red soil had to be fertilized and the black soil did not. Common for all soil types was, that the farmers led their livestock in the field after harvest to graze the field. This would have served as fertilizer input, as the livestock would excrete manure, but it is doubtful that this input would support the export of nutrients from the field.

Nitrogen deficiency was observed in almost every maize field (picture XX). The symptom was general pale leaves with an agropetal stratification. Nitrogen is an essential building block in plant growth and deficiencies are very crucial for yield size. This clarifies that, nitrogen input and output was not a balanced system, and the soil nitrogen pool was slightly depleted (Husted & Jensen 2009). What is believed to iron deficiency was observed in the red soil (picture xx.). The symptoms were is intervenous chlorosis with absolutely no necroctic spots on leaf surface. Iron deficiency reduces the photosynthetic rate in the plant.

Old soils can be deficient in iron as the soluble forms of Fe(II) and Fe(III) are scarce in the soil and nutrient solution, and mainly present as low soluble Iron oxides (Husted & Jensen 2009).

Picture 3: Nitrogen deficency in maize. The stratification was agropetal and general chlorosis of leaces where observed in the field.

Picture 4: What is believed to be Iron defeciency in Maize. The characteristic Fe deficiency symptom is intervenous chlorosis with no necroctic spots on leaf surface. The symptoms develop from lefa basis to leaf spots (Husted & Jensen 2009).

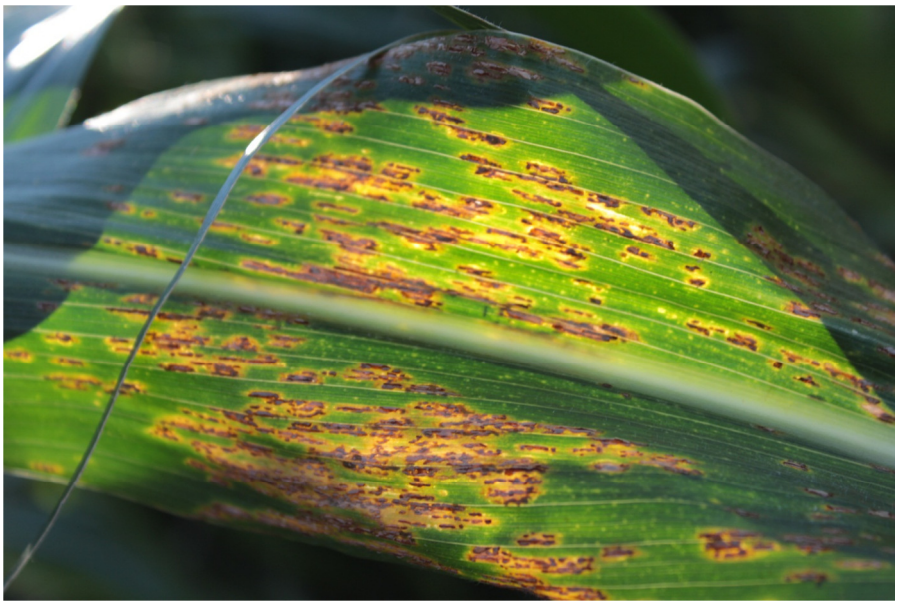
8.1 The effect of pests to agricultural production

The most problematic pest in the area was weed, which was abundant in all outfields competing with crop for resources. The most common weed control method was manual removal, but farmers who owned a tractor did practice interrow weed cultivation. Non the interviewed farmers used chemical weed control, as herbicides were too expensive. Aphids and fungus were also observed but to a minimum in some maize fields.

Fungus and aphids were observed I some cases. Picure XX shows maizerust (*Puccinia sorg.*) No one of the farmers controlled fungus in the maize. The observed fungus attack would properly not trigger a control anyway depending on the control threshold. Some aphids and Maize Stem Borer (*Busseola fusca*) *was mentioned as a potential threat by some of the farmers because chemical control was too expensive, though o*ne farmer applied insecticides in his outfield, but did not remember the trivial name. This pest is considered the most infecting insect pest in maize at altitudes over 500 meter above sea level in the sub-saharan Africa (Maizedoctor 2013)

It was learned that birds constituted a threat, when planting the outfields. One of the farmers applied avicides when planting for the control of birds (Stephenson & Solomon 2007). Another farmer experienced birdpests

when growing sorghum, but instead of applying avicides, he controlled the birds with scarecrows and human activity in the field.



Picture 5: Maizerust (Puccinia sorgi) in an attacted outfield. A solution to rust could be resistant or tolerant cultivars or application of fungicide.

9 Box 3: Mphatlalatsane Community Development Project

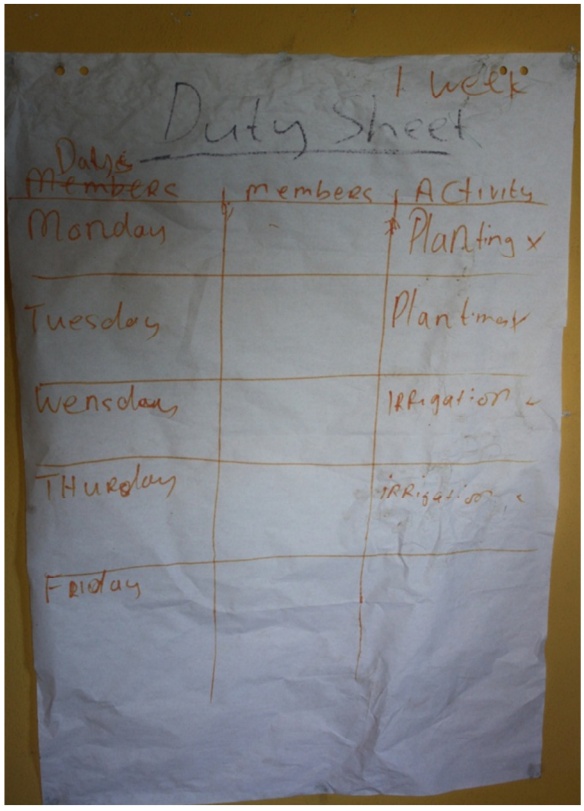
The Mphatlalatsane Community Development Project was founded in 2004 and began with some volunteers cooperating about farming 6 hectares of land. Later the group of volunteers applied and received support from the Agricultural Department which entailed they were allocated 20ha by the Headman. The idea behind the project is to produce and sell crops which can support orphanages' children education and projects which benefit the community. A variety of vegetables such as; potatoes, spinach, cabbage, mustard, carrots, tomatoes, and green pepper grow on the field. The products are sold both in- and outside Mpharane, and the project is generally perceived as positive in the village and many buy potatoes from this project.

There are 12 other members including Miss Mabindisa, the Chairman, who see herself as a mentor assisting with the administrative work related to the grant from the government. As her primary job she works as a teacher on public school. She was given courses in agriculture by the government and holds two agriculture certificates to guide the growth of crops. A challenge for the project had been conflicts, related to sharing the amount of work between the members, which sometimes occurred. During the year season workers are hired. Around Christmas the project employed 22 teenagers to remove weed. They worked for a week and received 100R which they could use to buy Christmas presents for their families.

The 20ha field is located in the eastern part of Mpharane in proximity of the wetland, which means the field is highly vulnerable to flooding. During our fieldwork, the entire field, with all the vegetables planted, was flooded. Engineers have looked at the problem but nothing has been done so far.

Picture 1: Chairwoman of the project Mabindisa Milicent.

Picture 2: The community garden project in Mpharane which is currently overgrown with weed due to flooding.



Picture 3: Duty sheet for the 12 members in the community project.

10 Land access for villagers in Mpharane (LENEISJA, Morten, Maja, Line, Ditlev)

A crucial component for the opportunity to sell and earn an income from a yield is the access to land. All though lack of land is identified as a constraint for crop production in former homelands (Lahiff and Cousins 2005; Adams et al. 2000; Freguin-Gresh et al. 2013; Senyolo et al 2009), the Subheadman from Motlokofane said that he never denied anyone access to land in his area. Nonetheless, as seen Figure 11 the majority from the random selected questionnaire does not have access to land.

However, the villagers from this survey who tried to get land by asking their local Sub-headman permission to an outfield were rejected with the comment that '*no space is available*'. This indicates that it is not only lack of land but also distribution and sharing information which are challenges connected to land access in Mpharane.

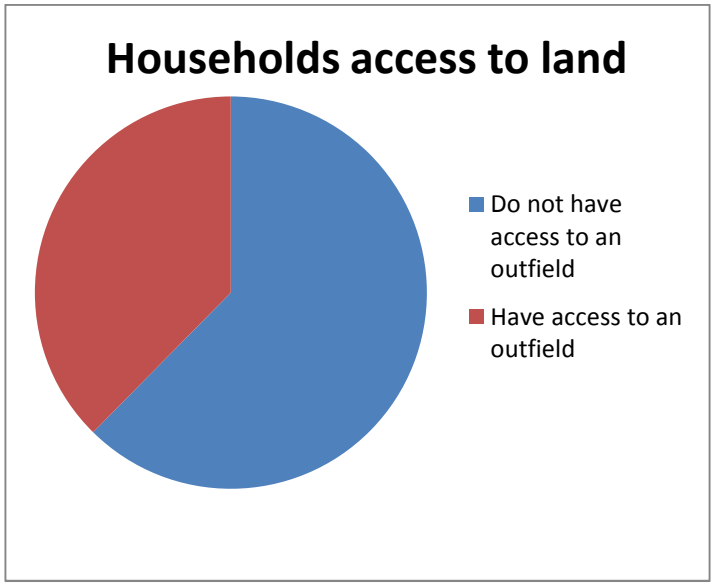


Figure 11: The diagram is based on the random selected questionnaires with 19 households.

As shown in theFigure 12 below, the majority of those with access to an outfield inherited it from the family.

Land here to us is like a will – generation to generation owns it

Ward Councillor personal communication

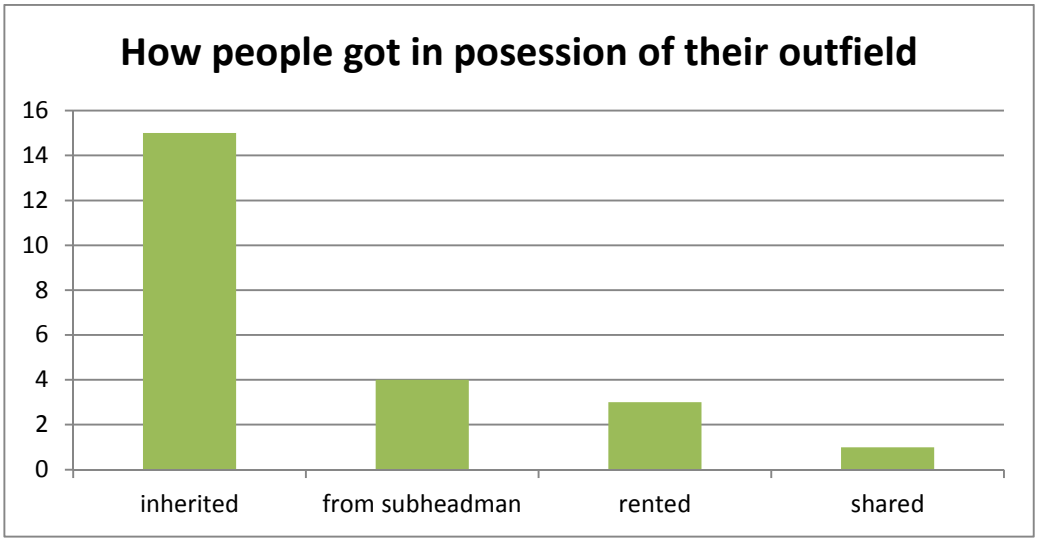


Figure 12: The diagram is showing how people got in possession of their outfield

Besides holding an inherited Permit to Occupy a household can obtain access to a field by borrowing or renting another households outfield. Throughout interviews and questionnaires, it became clear that a number of different borrowing rules are being applied.

During an interview it was explained how the former headman, who died in 2000, had been maintained a rule that the person borrowing another household's outfield should pay 2 bags of maize.

According to the current Sub-headman for Chere/Motlokofane the household owing the field should be paid depending on the yield. Apparently, this was interpreted by many villagers as if the harvest should be shared equally. Two farmers, who owe a tractor, would like to farm more land but they explained that if they borrowed a field, the field owner expected 50% yield all though they did all the work.

Those being successful renting or borrowing other households' outfields made individual agreements with family, friends or neighbours. One agreement could be to pay one goat in exchange for using the outfield for a couple of years; another agreement could be a specific payment.

Thembivile, a farmer without a tractor, explained that he had encountered disagreements about the workload of a shared field. It seemed to be a common challenge about the borrowing rule - that some had been working harder and also found it fair to require more than those who did less. This entailed that people in general only would share with people they trusted and knew in advance.

As shown inbox 4, Thembivile gained access to five different outfields beside the one he has a PTO for. What characterised all agreements was that he knew people beforehand.

Thembivile Mbanga, 49 years old, cultivating six outfields of which he had different access	
	Sort of access:
1st outfield	Permit to Occupy inherited from family.
2nd outfield	Share workload and expenses with neighbour.
3rd outfield	Rents it for 500 R from an acquaintance.

4th outfield	Rents it for 500R from an acquaintance.
5th outfield	Share tractor expenses and crops with an acquaintance. Thembivile Mbanga does all the work connected to cultivating except removing weeds.
6th outfield	Share tractor expenses and crops with an acquaintance. Thembivile Mbanga does all the work connected to cultivating except removing weeds.

Box 4: shows the different ways in which a farmer in Mpharane got in possession of the outfields that he is using

The issue of access to land is therefore also closely connected to distribution of land and the issue of trust for those borrowing a field. The Headman comment about the various lending system was that it would be impossible to change the overall agreement where people shared the yield. From his point of view would be difficult to find a solution that would suit everyone.

When people who wish to farm land cannot get access, all though a big number of households doesn't farm their fields, it does imply that the community has a challenge with the current way of distributing and managing the land. Ntsebeza (2004) concludes from her empirical studies in many rural areas of Eastern Cape that the absence of both formal and informal rules results in a questionable management of common natural resources.

Whether the trend of villagers negotiating individual rules is due to lack of management or an approach which considers people as better off when figuring things out individually, can be discussed. Cousin (2007) also illustrates such dilemmas from his research about land tenure.

The access of land, in Mpharane, is also a question about who should have access and how much access people should be allowed. The current system where some farmers are eager to get more land while many with land cannot afford to cultivate their own outfield does not seem to benefit the community as a whole. Rather, the current land access system could be seen as a constraint of an expansion of farming available arable land.

11 Financing (MAJA, Line, Ditlev, Leneisja, Morten)

The main issue underlying why many people in Mpharane do not farm their outfield is lack of finances. As seen in Figure 13 5 of the 7 from the questionnaire who had access to an outfield was not farming it because of lack of money. This is a general issue in the Eastern Cape Province in South Africa (Mtero 2012).

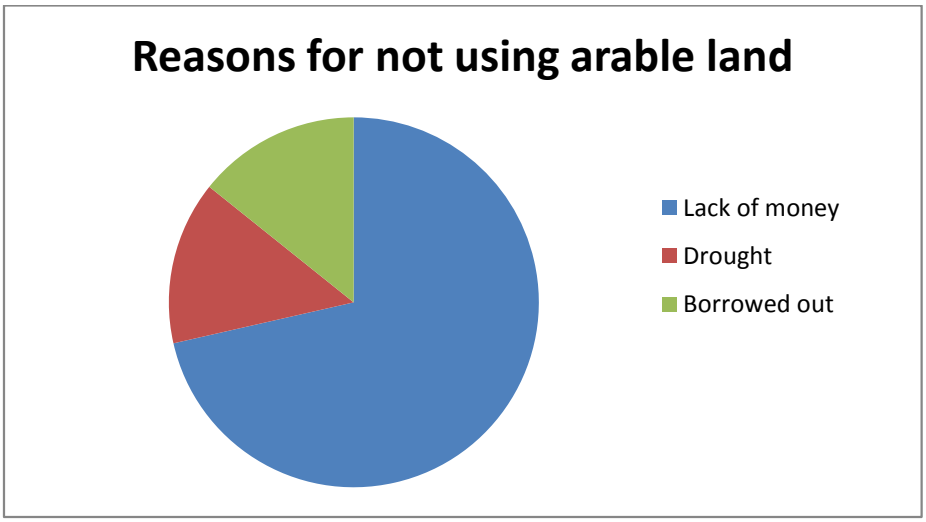


Figure 13: Results from questionnaire

Further crop farming entails great risks in regards to the level of yields, this makes it a risky investment and cause that some do not invest in crop farming. Large scale commercial farmers in South Africa rely on different costly inputs such as fertilizers to obtain a higher yield, however small-scale farmers as the ones in Mpharane are not able to make use of the same measure because of their lack of finance (Mtero 2012).

In Mpharane earlier many people used their own oxen to plough their field, this lowered the input-costs for the farmers, since many people had their oxen stolen, this development led to a decrease in the outfields ploughed (Nomthetheleli Tekete, personal communication). Today many people use a tractor to plough the outfields, which has caused an increase in the operation costs of farming an outfield, the people interviewed pay between 600 and 850 Rand to get one field ploughed. It is a general trend that many small-scale farmers have to give up farming due to the increasing costs (Mtero 2012).

On this basis lack of money is one of the largest constraints for a more market oriented production in Mpharane.

Table 4: Outline of lending possibilities in Mpharane.

Lending Possibilities in Mpharane	
Stokvel	**Loan sharks**
There is a Stokvel association in each of the different sub-villages in Mpharane. Nomzamo Ngidi is one of 5 members in a Stokvel,	Around Mpharane there is different individuals who are known for borrowing out money to people. These are referred to as 'Loan Sharks'. They

where they pay 50 Rand each month to the shared box and at the end of the year they share the earnings. Normally people are able to borrow maximum 200 Rand from the Stokvel and seldom people borrow to plough their fields from this Stokvel. The interest rate is 20% per month and people have to pay back the interest every month.	demand the same interest rate as the Stokvels of around 20%. In the village this option seemed to be unpopular because of lack of 'customer care', as one farmer mentioned.

Based on information from informal conversations, interview with farmer, and interview with Nomzamo Ngidi

In Table 4 the 2 known lending possibilities within Mpharane; Loan sharks and Stokvels, are explained.

When talking to the different farmers in Mpharane, both the ones currently farming and outfield and the ones with access to outfields but not farming, none had ever borrowed money for crop farming. In general there seems to be a negative feeling about borrowing money in the village. One exception was a relative large farmer Moses Golo who also had a plan of a more market-oriented production. He wanted to plant potatoes on one of his outfields, the yield would be resistant to the problem of livestock trampling down the crops and then he had a plan of making contracts with different supermarkets to sell the yields. For him the financing possibilities in Mpharane were a strong constraint for carrying out his plan of a more market-oriented production.

The farmers opposition in regards to borrowing money could be a constraint, on the other hand this opposition can be due to the large risk involved in crop farming in terms of the level of yield and thereby risks in terms of being able to pay back the loan, another reason could be that the lending possibilities in Mpharane are not favourable enough.

Many small-scale farmers in South Africa use livestock as a form of liquidity to insure an even income level or as an insurance (Fenwick and Lyne 1999). This is also the case in Mpharane, e.g. some sell an ox the years where the family is not able to plough their field or experiences a bad harvest. Selling of livestock can also be done to raise money to plough a field (Moses). This is another example of the integrated farming structure in Mpharane, where some are dependent of their ownership of oxen to be able to farm outfields.

The farmers in Mpharane not possessing private title deeds on their land and the absent of sale market for land stand as a constraint for the farmers to obtain loans in many financial institutions (Fenwick and Lyne 1999; Senyolo et al. 2009). Formation of village banking has by some been suggested as an instrument to enhance the rural South African population's access to lending and saving possibilities (The Department of Agriculture, Forestry and Fisheries 2009).

The two interviewed tractor owners both saved up money from their non-agricultural jobs to buy the tractors. Ditabat Tenza was able to save up 381,000 Rand over 5 years and hereafter paid the tractor in cash. However most people in the village do not have large incomes and use their money shortly after payout;

As soon as I earn some money I use them right away. I go to the supermarket, pay the doctor etc.

Interview with Matlatseletso Taoana

In literature saving groups for farmers have been widely discussed and this type of saving groups is also seen many places in the rural South Africa. Both positive and negative results have been experienced in empirical studies (Kruger 2010; Coetzee 1998; Coetzee and Cross 2002), but the importance of mutual footing and social relations have been identified in empirical studies from the Matatiele area as important elements to reduce the risks of pitfalls (Kruger 2010). The tractor association is a positive example of a saving group where the members have a mutual interest (see box XX). Some farmers in Mpharane has also uttered the interest to meet in groups to help each other e.g. by sharing experiences. Most small-scale farmers in South Africa are involved in savings activities compared to credit (Coetzee 1998).

Based on the empirical results lack of money is seen as one of the largest constraints for crop farming in Mpharane. Further the current lending possibilities can be seen as a constraint.

12 Box 5: Homegarden

Most households in Mpharane were cultivating a homegarden in connection to their house and for many it was important for their subsistence. In figure 1 it is seen that 50% of the households from the questionnaire ranked their homegarden as the first or second most important livelihood activity for income and subsistence.

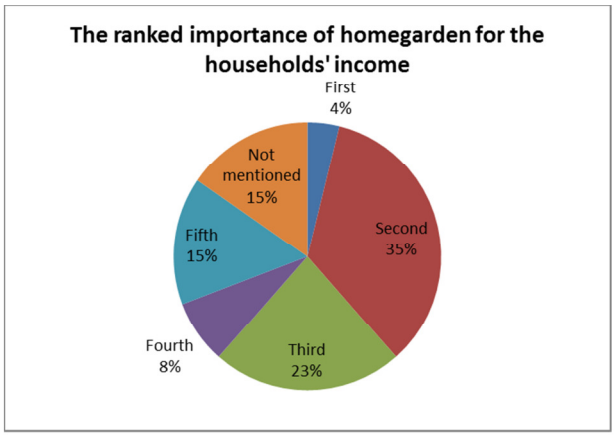


Figure 1: The ranked importance of homegarden for the households' income, results from the questionnaire survey

Picture 1: Vegetables grown in a homegarden in Mpharane

Some of the villagers also sell vegetables from their homegarden, e.g. Matlatseletso Taoana who grows turnip in her homegarden.

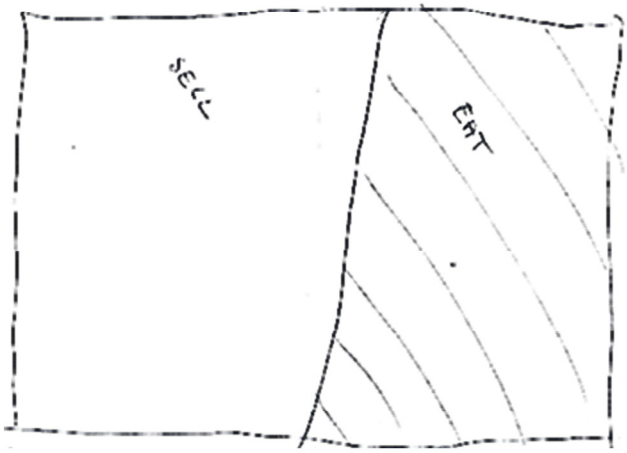


Figure 2: Mapping of use of homegarden made by Matlatseletso Taoana

Picture 2: Matlatseletso Taoana in front of her homegarden just before the season for planting of turnips

As seen in figure 2 she sells more than half of the yield from her homegarden. She both sells in Mpharane and in Matatiele. In Mpharane she uses the marketing method of 'mouth to mouth' where people come to her home and buy. In Matatiele she has one regular buyer. She packs the turnips in large bags and takes the public bus to Matatiele where she meets her contact at the bus station and exchange the turnips for money. The price is always fixed on 5 Rand per bundle also when she sells large quantities. It is easy for her to sell the turnip, because as she says; *"People in Matatiele are in need of turnip"*. She has not considered developing her turnip-business further because her current business is going well and she is very satisfied.

13 Market Access and Sales (MAJA, Line, Morten, Ditlev, Leneisja)

A general trend of not selling or only selling a small part of the yield from crop farming is seen for small-scale farmers in South Africa (Lahiff and Cousins 2005). This trend was also seen in Mpharane from the results of questionnaire and in-depth interviews made with villagers who were farming an outfield. These results also showed that this trend was mainly due to the small-scale size and because of the high internal demand of maize in the family and to the livestock, therefore most of the yield were used for the households own consumption. Further there is a tendency of giving maize to family and friends in need. "*The network is helping each other and therefor they are not selling*" (Caswell Tenza). On this basis it can be said that selling to obtain an income is not the primary reason for ploughing their fields, the primary reason for the farmers in Mpharane is to supply the family and their livestock with maize, which is a staple food in South Africa.

However some of the farmers do sell. Some of the larger farmers sell every year but most sell during the years with a good harvest where they sell the leftovers of the yield after covering the requirements of the family and the livestock. The ones who sell primarily sell from their home, "*the people who are in need of maize come to me*" (Ditabat Tenza, informal conversation) this can be seen as the explanation for the point of sale for many of the farmers. Many people are not interested in going into town or at a market to sell their maize based on the above explanation instead they use informal marketing through the method of 'mouth to mouth'. They mostly sell to people who live inside Mpharane and it is often the same people who come to buy.

Another reason for mostly selling from their home could be the issue of transportation. This is due to that there is no physical formal market in Mpharane. Very few farmers in Mpharane have access to a car or other private transportation, on this basis the only mean of transportation is the public bus leaving from Mpharane to larger towns, such as Matatiele, this is a constraint for the local farmers in terms of reaching out to a larger group of customers and thereby also for a more market oriented production. In Figure 14 Matlatseletso Taoana has mapped the different use of the family's maizefield. She sells vegetables from her homegarden in Matatiele (see box 5) but when it comes to the maizefield they only sell from their home to people from Mpharane. Around half the yield, of 10-15 bags of 80 kg, is sold, they are not interested in selling their maize in Matatiele due to constraints of transportation, which would be difficult and expensive. Further she expresses that they are very satisfied with the outcomes of their current business. "*The business is going well*" (Matlatseletso Taoana, personal communication).

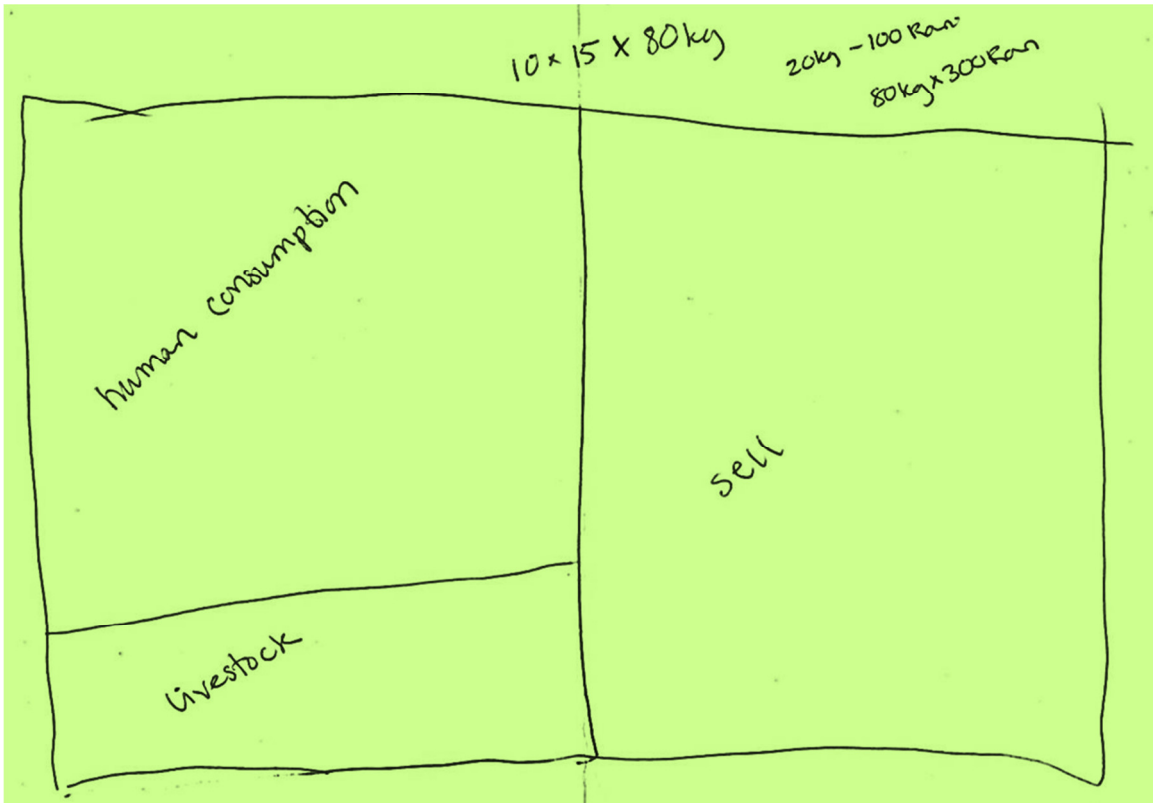


Figure 14: Mapping of use of maizefield made by Matlatseletso Taoana

In studies on small-scale farmers' access to markets in South Africa, costs of transportation and problems with transportation in general, are mention as important factors for choice of market channels as well as constraints for market access (Senyolo et al. 2009). The only farmer interviewed who owned his own car was Ditabat Tenza, during the years with good harvest he used his own car to go to large commercial farmers outside Mpharane to sell maize as livestock fodder.

During the rainy season problems can occur if the rivers are flooding, because of the relative low level of infrastructure and the conditions of the roads it can result in difficulties for the busses to access Mpharane (Own observations and informal talks with Torben), which also can be seen as a constraint. The problem of infrastructure has been put forward as a constraint which need government intervention, problems of small-scale farmers' access to markets related to infrastructure is often experienced in the former homelands in South Africa (Senyolo et al. 2009).

A large constraint for the crop farming in Mpharane becoming more market oriented is the current form of farming. Mpharane consist mainly of small-scale farmers. As mentioned earlier some of the farmers see lack of land as a constraint for raising the level of their production, if they were able to plough more fields they would have a possibility of increasing their sales. According to one of the larger farmers there is a high demand of maize and it would be possible to sell more. In the literature it has been identified that small-scale farmers' marketing strategies often are more dependent on other factors than the characteristics of the available markets, such as access to land and the ability to reduce risks (Louw et al. 2008).

There were several small supermarkets in Mpharane the vegetables sold there were produced by the owners (Informal conversation with Ben Tenza). The maize meal sold in the supermarkets was produced by

large national companies who enriched the meal. Further there seemed to be a general opinion in the village that the maize meal from the supermarket tasted better than when the farmers grained their own maize.

South Africa is currently experiencing an increase in the urban population which has led to a change in the agri-food supply chains. Supermarkets are playing an increasing role and they are moving in a direction of using fewer but larger suppliers which are causing a decrease in the role played by the small-scale farmers in the supply chains (Louw et al. 2008).

As mention earlier one of the initiatives which the ward counsellor and the Agricultural Department want to promote in connection to the new Agriculture project is for the farmers to form co-operatives and take advantage of the possible larger yield to make contracts with supermarkets in Matatiele on purchasing the yields (Informal conversation with the Ward Counsellor). In the literature and in many previous empirical studies focus has been on the importance of small-scale farmers cooperating on mutual market coordination and initiating cooperation with farming interest organisations to increase their access to formal markets, both in terms of buying inputs and to sell their output (Louw et al. 2008; Kruger 2010; Senyolo et al. 2009). However an empirical study from the Matatiele area showed a trend of small-scale farmers often not wanting to cooperate on marketing and as mention earlier the social bond between the members prevailed important for the co-operations (Kruger 2010).

From the data collected in Mpharane the farmers did not identify access to market as a constraint, they were satisfied with the marketing options they had. However many of the farmers would like to sell more, but for them the market access was not the issue, but merely their relatively small level of yield.

14 Discussion (ALL)

Before discussing the results in connection to the overall problem statement, a reflection of the methods is presented in which general shortcommings and advantages of the used methods are being discussed.

14.1 Reflection of methods

14.1.1 Triangulation

In general, the triangulation between social science methods and natural science methods has worked well. This led to an explosion of the different themes from a transdisciplinary angle. Through interviews and questionnaires we got an impression of the villagers' view of the different soil types, which we triangulated by doing soil samples.

Triangulating of questionnaires by doing key informant interviews was also very benefitting for our results. The interview with the Ward Councillor and the headman gave a further insight to some issues that had previously briefly been presented in questionnaires.

Triangulation also worked as a disproving tool. We were for example told that there was loaning opportunities in connection to the New Agriculture Project, which was disproved at the Agriculture meeting.

We tried to obtain official documents for the two agriculture projects from the Matatiele Municipality to verify the information we got on it, but we did not succeed. This had consequences for analysing our results, since we had problems judging the possibility of the New Agriculture Project to support more market-oriented production.

14.1.2 Biases and participation

Using translators when conducting interviews influenced the way interviews were running. Our translator was not educated in translating, and our lack of experience meant that his role was not always neutral. Out of eager, he tended to sometimes answer the questions himself or provided the interviewee with examples of answers which means that our results could be biased. On the other hand, our translator had an agricultural education, which meant that he was very engaged in our project and had a lot of knowledge that benefitted our research.

During PRA-sessions we faced difficulties in involving the participant e. g. when doing the seasonal calendars. This resulted in us introducing a number of categories which might have led to biased answers and did not give us the full story from the participant's point of view. We later discussed how the balance between probing and asking in depth questions without putting words in the other person's mouth were blurred at a few of these sessions.

Another example was the ranking exercise, where the categories were premade together with our translator and hence not the participant. On the other hand it gave us the possibility to compare answers which increased our use of the results. Some of the reasoning for ranking might have gotten lost in translation because most discussions happened between the translator and the participant.

Our group was often parted in two smaller groups with different translators. This had various consequences for our data; of course the two translators have different ways of translating and asking questions. One example is that on question 30b) in our questionnaire, all respondents to one group were emotional whereas the other group only got neutral unconcerned answers.

It would have been benefitting for us to be more thorough in our daily briefings and be better at reflecting upon our methods during the field work and adjust methods. This could have improved the quality of our data and thereby leading to more useful results.

14.1.3 Shortcomings

Our constraints in regard to analysing the soil samples was that we were not able to analyse if the nutrients were balanced, which could have been valuable for us in terms of assessing the biophysical constraints for market-oriented production. One of the three soil samples was conducted in a grazing field. Due to lack of time we were not able to find a more representative spot. This affects the results from our soil analysis.

Being aware of the shortcomings of the snowball sampling, we found it necessary to use this method because it was a quick and effective way of finding households that were actually farming an outfield. These interviews gave us enough information to get an idea of the constraints connected to market-oriented production for the farmers in Mpharane. These constraints were also verified in the literature.

In the literature remittances from family and lack of workforce has been presented as important aspects for small scale farming in South Africa, but we did not encounter it during field work. This could be due to our way of asking questions which was not understood in the local context.

When we started analysing our data, it became clear that there was a predominance of constraints compared to possibilities for more market-oriented production. The reason could simply be that there *are* more constraints. Or because of our choice of sampling methods and ways of asking questions.

14.2 Discussion of problem statement

As presented in the analysis of our results above, there are a number of constraints for a more market-oriented production. These constraints are both biophysical and socioeconomic. In the following section these will be discussed and focus will especially be on how these two areas of study are interrelated.

In the market access section it was shown that the actual access to a market was not seen as a problem for the farmers in Mpharane. Instead the biggest issue was the low yield.

The explanation of the low yield is found both in the biophysical and socioeconomic constraints.

Severe biophysical constraints are connected to climatic risks such as hail, drought and flooding. These risks make the farmers hesitate in investing in farming, since a failed harvest is a big threat to the household's survival. There is limited possibility of mitigating to these risks, since there is not enough capital to implement for example drainage systems. On the other hand, capital cannot prevent natural disasters like hail which is why the risk of crop damage always will possess as an actual threat to the agricultural production in this area.

When it comes to cultivating the fields, capital is a constraint, since many people do not have finances to pay for a tractor to plough their fields. Lack of liquidity also entailed that most farmers did not apply any artificial nutrients and only some applied kraal manure from the livestock kraals. This especially has negative impact on the red soils that are exhausted and depleted from nutrients resulting in a lower yield. On the black soils there was no conspicuous nutrient deficiency, even though these fields had no applied fertilizer due to the general conviction. But a case of latent deficiency of some nutrients could be a potential problem. The villagers' use of integrated farming meant that some nutrients were returned as input when livestock grazed the outfield just after harvest.

Some farmers were interested in receiving advice about farming practices, including nutrient inputs, but they did not know who to approach. However there was an arrangement in place of the extension officers offering advice and education to farmers in the Matatiele municipality, though it seemed like they have not been able to extend peoples knowledge of this service.

Besides lack of advisory, limitations in regards to land access are also identified as a constraint. This restricts the possibility for enhancing production to a higher scale and thereby increasing the yield and the possibility of sale. The distribution of land and the variety of the borrowing rules did not seem to support the cultivation of land. Since all land is communal property and under tribal authority, farmers who could not afford to plough their outfield cannot use their field for obtaining a loan to get access to liquidity.

Also, the potential loss of money due to the above mentioned risks where for some households too high compared to the possible outcome, which could be an explanation of why none of the farmers have ever lent money to cultivate their field. The combination of lack of access to credit and that it is not common for farmers in Mpharane to be engaged in saving groups enhance the constraint of lack of credit. With the new Agriculture project the Ward Councilor promotes people to go together to raise the needed money for participation, further he sees a big potential for a more market oriented production through formation of cooperatives however this is not the general aim of the people considering participating in the project.

One reason for the contrasting expectations for the new Agriculture project is that farming is not seen as a primary income source since crops are mainly grown for consumption to the household and livestock, where selling is the third priority. Due to lack of income from farming people are diversifying their income strategies. Therefore, a barrier for intensifying production could also be the preference for stable monthly incomes unaffected of climate shocks and other risks.

Conclusion (ALL)

Why do people in Mpharane mainly produce to own consumption and what are the constraints and opportunities for a more market oriented production?

Villagers in Mpharane engage in subsistence farming as part of their household strategy. But only a minority in Mpharane base their entire livelihood on agricultural activities, it is common that people gain from several livelihood activities to decrease their vulnerability to risks.

The farming practises are characterised by being an integrated system. It is a small-scale and low input system which often lead to a low yield. This is mentioned as the largest reason why the products do not reach a market.

Other constraints for more market-oriented production entails both biophysical and socio-economic barriers. For some soil types lack of nutrient can be a constraint for increasing yield, whereas other soil types are more exposed to flooding. Climate related risks are seen as the most hazardous constraint for crop production in Mpharane. The high risks causes hesitation to invest in farming. Lack of liquidity is another important limitation for crop farming, many people with access to an outfield are not able to farm because of the expensive operation costs. The current system of distributing land constrains farmers who wish to farm more land and increase their market-oriented production.

The new Agriculture project has been promoted as a possibility for a more market-oriented production. It is also seen as an opportunity to expand the cultivation of land for those who cannot afford to plough their fields by sharing the cost with other villagers.

15 Perspectives

Due to lack of money being such a big constrain for a more marked oriented farming approach, more financing option for the villagers would be very helpful. A way of doing this could be to start up more saving groups in the village which the involved people could then borrow money from. Challenges to this other places in South Africa has commonly been lack of understanding of such cooperatives and lack of education among the involved (Ortmann & King 2007). There is the possibility of a government grant when starting up

saving groups (Kruger 2010; Ortmann & King 2007). Unfortunately, research from Matatiele shows that people are often experiencing difficulties in assessing this support(Kruger 2010). If these groups were successful, investments in the agricultural sector could lead to more efficient farming systems in Mpharane.

Changing the current land assess system to a system with title deeds could also promote more agricultural development in the city. Those people that could afford to have efficient production could buy more land that could then also be farmed efficiently. The downside to this would be that it would make the poor people poorer due to them being stripped of their land.

The climatic trend for South Africa is towards less rain and more frequent drought, but at the same time also more frequent floodings. Therefore basically more extreme weather (Mason 1996). This means that investing in implements to prevent these natural hazards will only continue to be more relevant for farming land in Mpharane.

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Appendix 1: Final synopsis

The role of crop farming in Mpharane – constraints and opportunities

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Synopsis

Historical and current trends in the society

South Africa has since 1994 been working to overcome the wide range of challenges which were entailed by the 46 years of apartheid which was introduced in 1948. A number of reforms have been addressing the issue of land distribution between black and white people. The 3.5 million black people who ended up being relocated during apartheid could from 1994 claim their land back through the betterment schemes[1].

However, reclaiming land has not been sufficient to combat poverty in rural areas which are still lacking infrastructure, education and employment opportunities. Poverty in South Africa is largely a rural phenomenon and approximately 70% of the rural population lives below the national poverty line (Hall 2004: 1-2). The government has mainly been supporting commercialized farmers rather than small scale farmers (Edward Lahiff and Ben Cousins 2005:128). Many small villages on the country side, such as Mpharane Village, comprise of mainly small scale and subsistence farmers, this mean that they in general have been managing their own household economies without much government support in regards to farming. It is debated how important an aspect subsistence agriculture is for the sustainability of villagers' livelihood strategies. This is due to that many prefer travelling to the cities seeking employment there or sustain their living from remittances from family members, who works in the cities. This is also illustrating the remaining challenge of being integrated in the merging South African economy for the rural areas.

In recent times there has been a negative focus in regards to the presumed small role that small-scale farmers are to play on rural growth however empirical studies show that especially small-scale farmers play a significant role in development in rural areas both in regards to general development and also in relation to non-agricultural employment opportunities (Ngqangweni 1999).

Local context

Mpharane Village is located in the local municipality of Matatiele in the Eastern Cape province of South Africa. This local municipality is a part of the district municipality of Alfred Nzo District Municipality (one of 6 district municipalities in the Eastern Cape Province (Matatiele n.d).

Mpharane is characterized by having, especially among the adult population, a skewed distribution of males and females, with a majority of females (Prag & Birch-Thomsen 2013).

The percentage of poor people[2] in the Matatiele local municipality is higher than in the Province but on level with the district municipality. There is an unemployment rate of 37.3 % (South African Local Government Association 2010).

The weather is not that hot in the area. In the winter, the temperature is around 7-10 degrees, while in the summer it is 18-24 degrees. The rain is concentrated from October to May. Vegetation cover is generally composed of grassveld. The most common soils in the area are acidic (Gwaze et al. 2010 cited from Mucina & Rutherford 2006).

[1] http://www.culturalsurvival.org/ourpublications/csq/article/relocation-and-conservation-transkei

[2] No definitions is given.

This study: importance of farming

This study will take place in the village of Mpharane, and the point of departure has been to look into why the villagers in Mpharane mainly produce for own consumption. Shackleton (2001) argues how the entire use of land-based activities constitute a bigger share than previously acknowledged and contribute to both social and financial part of the livelihood strategy. On the other hand, Punt (2006) has conducted a study in KwaZulu Natal which illustrate that the share of villagers' home production and home consumption only constitute about 6.7% of the total household income. Further the constraints and opportunities for a more market oriented crop production will be investigated.

In Mpharane, the AsgiSA project has been an attempt from the government's side to try to improve the efficiency for the village, unfortunately without success. Currently, a community garden/field is being managed by a couple of people from the village but we do not have access to information about whether the yields are used for subsidising the household or for sale. Furthermore, then most of the villagers' have a home garden, and some even also grow crops at bigger outfields. All of this could imply that the food they grow here is an essential supplement. Through the AsgiSA the government set up an initiative to increase growth in the rural parts of South Africa among other through an increased productivity and a more effective farming by involving private consultant companies (Mtero 2012) in areas such as the Mhparane Village therefor it seems relevant to investigate the opportunities and constraints for a more market oriented crop farming production in Mpharane village.

Ongoing development projects, AsgiSA

AsgiSA replaced the Massive Food Production Programme (MTPP) and was implemented in the Eastern Cape in 2012 (Mtero 2012). The objective of AsgiSA is to accelerate economic growth. It is also to redistribute these gained benefits better among the people of South Africa (Blignaut & Heerden 2009) and to half poverty by 2014 (Mtero 2012).

In order to achieve the economic growth 12 large scale projects has been implemented. Of these, only a few have relevance to the Eastern Cape Province. The relevant projects are;

1: A biofuel project.

4: A catchment and timber industry project.

(Blignaut & Heerden 2009)

Project 1 will bring along large changes in the agricultural sector in the Eastern Cape Province. An ongoing project is to increase the area cultivated with maize with 30.000 ha (ECDC n.d.).

The ideas of these maize schemes are that private consultant companies come into the village and take over the management of the land. The villagers then get a certain percentage of the income generated from the now more effective farming system.

The economic transformations due to the AsgiSA are to be achieved by making several major changes. The small rural producers should get better chances of making their way into the bigger market. Also, there should be more benefits from economics of scale – so making agriculture more large scale. Also, some of the fallow land should be transferred to agricultural land (Mtero 2012).

AsgiSA has been criticised because some of the projects will consume too much water (including project 1), (there are many arid areas in South Africa), compared to the economic growth that it could possible bring to the country (Blignaut & Heerding 2009).

In many cases, agriculture in the Eastern Cape is very inefficient (Mtero 2012, cited from different articles). In the 1980's a common yield was only 0.5 ton per ha[3] (Mtero 2012, cited from Ellis-Jones (1991:2–3)).Therefore there should be a great potential for improving agricultural yields.

Another ongoing project under AsgiSA, is the Provincial Growth and Development Plan (PGDP). This states that about 460.000 ha land is to be changed to arable land (ECDC n.d.).

Problem statement

Why do farmers in Mpharane mainly produce to own consumption and what are the constraints and opportunities for a more market oriented production?

In order to be able to investigate and answer the above problem statement different research questions has been made. These research questions will cover both the natural science perspective of the problem statement as well as the socioeconomic aspects (See Data Matrix).

Definitions

"Market oriented production" is defined as a commercial production of cash crops driven by supply and demand hence it can be sold on a local or out of town market.

Requested data

The data requested to answer this problem statement includes both a socio-economic and natural resource method approach.

Methodology

In attempt to study and answer our given research questions, different methods will be used in practice to gather and analyse data. To investigate our socioeconomic research questions, we will a range of PRA-methods such as subjective questionnaire surveys, semi-structured interviews, observations, community mapping, conversations with the local villagers and rankings. The strength of PRA-methods is that they all have a bottom-up point of departure, which gives better opportunity to empower the people being researched (Brockington and Sullivan 2003).

The natural resource questions will be answered through methods from the natural sciences such as soil analysis, GPS measurements, map search, timelines, observations on applied technique & BAT.

The following section will describe how the field work will be carried out in South Africa and why we have chosen the different methods.

[3] No mentioning of the type of crop. The numbers are from Transkei, which today is Eastern Cape.

Transect Walk

On the first day a transect walk will be carried out to get an overview of the research area and to pin-point places of interest in the local area and how to get an understanding of how the village is connected. A GPS will be used to make a detailed map of the village and the places of interest.

Questionnaire survey

The main purpose with the questionnaire surveys is to gather general knowledge and understanding about the households and agricultural practices in the village. Using questionnaires is a relatively easy way to collect large amounts of data, which is why we will use this technique one of the first days. This will give us a general overview in the village. The questionnaire will be designed before departure and finally approved by the interpreter. The target group for the questionnaires will be members of different households that have access to and is cultivating on an outfield, and they will be chosen in collaboration with our interpreter. The number of questionnaires will be around 10.

Semi-structured Interviews

Based on our answers from our questionnaire we will select households to do in depth interviews where we hope to find out how they perceive the constraints and opportunities for market oriented production.

The interviews will be more detailed and open compared to the questionnaires. This will also allow us to pose some in-depth questions to different individuals, which will allow for more descriptive and differentiated answers.

Ranking Exercises

This PRA method will be used to get an idea of the ranking of the different income sources for the villagers, and to understand the importance of crop farming as an income. In our questionnaire we will ask the interviewee to mention the different household incomes. Then as we do the in depth interview we will ask the interviewee to rank the incomes to find out how important they are to the household. The ranking session will give opportunity for discussing important issues.

Community Map

This PRA method will be used to get an insight into the different groups in the village's view of the role of farming. This method will give us an insight to how they perceive agriculture. The farmers will be asked to draw the map so it shows what the different areas in the village mean to them and their household.

The different maps will be compared as well as the size of the arable land drawn. This along with other results and answers from the exercise will be used to help identify the different roles of farming for the different groups in the village.

Soil sampling and assessment

We take the soil samples to assess whether there are any natural constrains in terms of soil fertility in the area and whether this is a general problem. It will also allow us to see whether there is a difference in the soil quality between the fields (especially regarding the outfields – home gardens).

Even though the farmers wouldn't be interested in actually producing a great lot more per area, soil knowledge will still be valuable information. It means that they could have an optimized field plan where they could grow the crop that are most related to the soil conditions there. This is due to that they could

then use the remaining land for something else. It is always better to have more land. Maybe they could rent this for cattle grazing or something similar.

A soils quality and potential for arable crop production is determined by several inherent and dynamic factors. In order to assess and evaluate soil of different types from different locations, these factors must be compared to evaluate the potential for crop farming and increasing production efficiency. In this thesis we will try to determine if there are any soil physical constraints regarding soil parameters to crop production I Mpharane, which can be used in a further evaluation of the cropping-systems in Mpharane.

We will make one big soil pit to get an overview of the conditions in the area. We will do this profile in the outfield.

We will take a few soil samples (with a soil auger) that we will take in the following manner. From the northwest corner of the map we will go in 50 m towards the southeast corner (if the field is smaller than this as in the case of home gardens, then half the diagonal). We will not take enough soil samples to make statistics on them. It is purely to get an overview of the local conditions.

The soil auger has the advantage that you can see distinct layers and the different horizons in the soil instead of getting a mixed sample.

We will analyze them for texture, pH and the abundance of different important plant nutrients (NPK). These experiments will be carried out based on methods from Bech (2012). The experiments will give us an insight in some of the physical constraints to crop production in the area.

The soil texture will be examined in various outfields and home gardens in order to determine the soil variation in the nearby area. Various soil samples will yield differently, so this is quite interesting in an attempt to determine potential yield opportunities in the area.

Data Matrix

Problem statement		Research Question	We want to know	Methods	Required materials	Literature
Why do farmers in Mpharane mainly produce to own consumption and what are the constraints and opportunities for a more market oriented production?	BASELINE	Historical use of home gardens and outfields compared to current use. How is the development?	Has the production increased or decreased over the last decades?	GIS		
			What is/was the use of farming land?	Transect walk maybe with farmer		
			Where is the good/bad farm land?	Community map, timeline		
	SOCIO ECONOMIC	What is the work force in farmning?	Who is working in outfields/home gardens?	Observations/interviews		
			How much time is spent by whom?	Observations/interviews		
			Who are responsible for the economy in the household?	Observations/interviews		
			Does the family size have influence on the use of crop farming?	Observations/interviews		
			What is the education level (primary school, college, knowledge about agriculture). Have anyone been taking farming courses/read theory?	Observations/interviews		
		What is the role of tenure rights in connection to outfields?	Who has access to land?	Questionnaire/(interview with chief)		
			Is it inherited or how long have they owned it?	Questionnaire/interview with chief		
			How can we perceive the power structures related to land tenure?	Analyse from questionnaire/ranking		
			Is there difference in plot size? (rent, heritage, options to buy more ground, social network)	Questionnaire/interview with chief		
			Have there been land reforms?	Literature research		
		What is the role of access to	Will it be more intensive if there was a market?	Interview		

		market?	Is there sufficient infrastructure?	observation		
			Is the lack of market because of lack of products or vice versa?	Analyse interviews/questionnaires		
		What other income related activities do they have?	Livestock?	ranking		
			Remittances?	ranking		
			Employment?	ranking		
			Pension?	ranking		
			Exchange of natural resources?	ranking		
			Do they perceive yield from the crop farming as income?	ranking		
			Is there a lack of labour in agriculture?	Interviews		
	NATURAL RESOURCE	What are the different agricultural practices in the village?	Where do people get there seeds from?	Questionnaire (/community map)		
			Do they apply fertilizers?	key informant		
			How intensive are the outfields cultivated?	Observations/transect walks/interviews		
			Which crops are cultivated where?	Observations/transect walks/interviews		
			What is the available farming tools/equipment?	key informant/ transect walk		
		What are the physical and biological constrains for agriculture in the village?	What is the distance to the outfields?	GPS measurements		
			What is the soil quality at the outfields/ home gardens?	soil samplings		
			Is there cultivation in the hills?	key informant		
			Are water limitations a constraint?	satellite map		
			Are there any pests threatening the agricultural production? Where?	Satellite map, interview		

Timeline	Forberedelse	Field work:										Report writing		Aflevering
	Before departure	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	week 12	week 13	4th of April
udforme questionnaire														
liste over materialer														
Selection for questionnaire														
Powerpoint for university in SA														
Transect walk														
Questionaire														
Soil samplings														
Community map														
Wealth ranking														
Interviews														
Interviews with experienced farmers														
Analysis of soil														
Aflevering af rapport														

Discussion and conclusion

We face a number of challenges in terms of being able to answer our problem statement. There are different pitfalls in terms of the chosen methods which will be undertaken during the fieldwork. Some challenges and insecurities are prevalent in terms of working with the interpreter in relation to the wording and communications which can affect the overall results of the different interviews and questionnaires.

In regards to the selection of households and individuals for questionnaires there will be a challenge in terms of getting a representative selection of the village. Further there are some practical challenges in regards to the soil sampling, for instance it can be difficult to investigate the soil texture while being in the field.

Based on the above challenges in terms of our field work, we still anticipate to be able to come forth with different opportunities and constraint in regards to making the crop farming in Mpharane Village more market oriented. Through these finding we expect to be able to some degree answer why the farmers mainly produce for their own consumption.

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Appendices

Appendix 1: Questionnaire

Appendix 2: questions for key-informant

Appendix 3: Semi-structured interview guide

Appendix 4: Suggested outline for the report

Questionnaire:

1. How big is the household?
    a. People who live in the house?
    b. Family/friends members outside Mpharane?
2. Which elements or activities are important for the household's income?
    a. Rank the five highest and most important income-related activities? (Cash crop, livestock employment, pension etc.).
3. Do you have a home-garden?
    a. Do you use your home garden for crop farming?
4. Do you have access to outfields?
    a. Do you use you're the outfields for crop farming?

(If neither making use of the home garden or outfields for crop farming go to question XX)

Home garden:

5. Do you apply any fertilizer in your home garden?
   Manure

   Inorganic fertilizer

   None

6. Unless none in 5. How much do you apply of the fertilizer to your field?

   Amount (kg)

7. Do you use any mechanical helping devices in your home garden?
   Tractor

   Oxen

8. Which of the following crops do you have in your home garden?
   Maize

   Cassava

   Other

9. Do you use any kind of pesticides in your home garden?
10. Where do you get your seeds to your home garden from?
    Outside the village

    This village

Outfields

(if you do not have access to outfields go to question XX):

11. Do you apply any fertilizer in your outfields?
    Manure

    Inorganic fertilizer

12. Do you use any mechanical helping devices in your outfields?
    Tractor

    Oxen

13. Which of the following crops do you have in your outfields?
    Maize

    Cassava

    Other

14. Where do you get your seeds to your outfield from?
    Outside the village

    This village

15. Where you part of the Asgisa?
    Yes

    No

16. Are you part of the agricultural community project?
    a. If no, would you like to be part of it?

If not making use of neither a home garden nor outfields for crop farming:

17. Would you like to grow your own crops in your home garden?
18. Would you like to have access to an outfield for crop farming?

Questions for key informant

Overall, are there any important pests and problem wildlife that we have to be aware of in this area?

Which kind of farming equipment do the people in the village use?

How intensive are the outfield in general cultivated?

Is water limiting in the area?

Is there cultivation in the hills?

Do people apply fertilizer?

Semi structured interviews

Farming

- Which vegetables are grown in the home gardens?
- Why do you grow a home garden instead of buying from others/at the supermarket?
- How do you get access to an outfield?
- Which crops are being grown at the outfields?
- What are the different crops used for?
- How much time is spent on the home garden, outfields, other activities (maybe make a map).
- Which kind of equipment do you have for cultivating the fields?

Income related activities

- Do your household have access to livestock, natural resources other substitution activities?
- Do you make any crafts work for selling?
- What is the household's income?
- How big a part of the income is related to agricultural activities?
- Which different sources does the household receive monetary income from? (Employed work/remittances/going to markets and selling stuff).

Livelihood background/personal relations of the villagers

- Have you attended school? When? Primary school? When did you begin working?
- What is your family's occupation? Did you learn farming methods from your father/mother?
- Is there a market for exchanging/selling a surplus of crops?
- Can you draw a map of your closest relations and who you get help from.
- Rank activities (Please rank the relative importance of the different activities). What is the most important in relation to income gains, well-being, labour/time etc. (use a map/schedule).

AsgiSA

- What is your experience with AsgiSA?
- When did they start the initiative?
- What happened?
- For how long did the activities take place?

Community project

- What is the essence of the community project last year?
- Who participate in the community project?
- How much time is spent on this project?
- What is the outcome? Crops for selling or consumption?

Hierarchy in village

Suggested outline for the report

Abstract

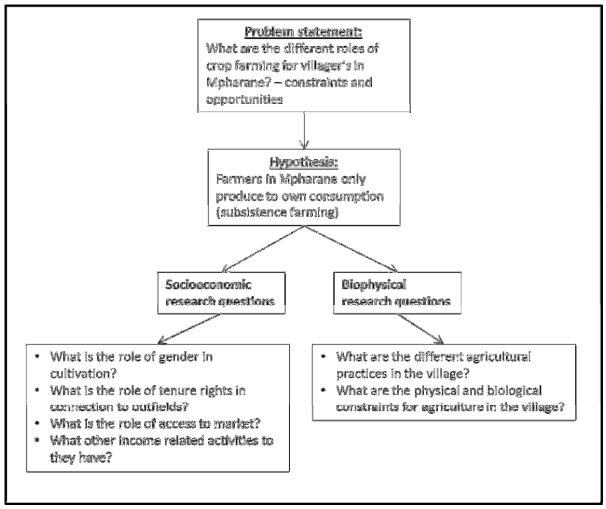
Introduction

- Here we start with a wide introduction and narrow it down to our problem statement

Structure of the report

- Here we explain the structure of the report so that the reader knows which sections come when and why

Research Questions



Figur 1 - the figure shows the structure of the research questions

Problem statement:

- Why do farmers in Mpharane mainly produce to own consumption and what are the constraints and opportunities for a more market oriented production?
    - Explanation and definitions

Research questions

- Here we also define “each word” of the research question – and maybe the reason why we are asking this particular question, what we hope to know from it

Baseline

- The historical use of homegardens and outfields compared to the current use

Socioeconomic

- What is the work force in farmning?
- What is the role of tenure rights in connection to outfields?
- What is the role of access to market?
- What other income related activities to they have?

Biophysical

- What are the different agricultural practices in the village?
- What are the physical and biological constraints for agriculture in the village?

Methods

- Explanations of all the methods that we use and why we have chosen to use them, what we think they can give us – specify which methods we use for which research question
- Critics of methods? Our shortcomings of the different methods (I don't know if it should be here or somewhere else in the report
- Analytical framework
    - Livelihood strategies? Explain why we only ise part of the livelihood framework
- Existing literature

Background/local setting

- Climate
- Demography
- History of SA and of the area
    - Betterment scheme, apartheid, homelands
- AsgiSA and other development projects
- Land reforms before and after 1994
- Answer to RQ 1 about the historical use could be incorporated to this section

Results

- Our results for each of the research questions and analysis of those

Discussion

Evaluation of methods

- What were our shortcomings
- Defend why we did as we did

Conclusion

Perspectives

- Future research areas

Literature list

Appendices

- Synopsis – Questionnaire – Semi-structured interview guide – Methods

Appendix 2: List of Methods used

Methods used in the Report

- 19 questionnaires incl. ranking
- Questionnaires developing into interviews
- Indepht interview w/
    - Homegarden → snowballing
    - Stokvel – community micro lending
- 4 snowball method interviews with farmers with outfields
- Key informant interviews with
    - Large farmer
    - Tractor Association Chairman
    - Community garden chairman
    - Asgisa-participant
    - Subheadman of Chere
    - Headman of Mpharane
    - Agriculture shop manager
    - Translator (Ben)
- Soil sampling at 3 different soils
- Participation in community meetings
    - Ward Counselor meeting on Agriculture Project
    - Weekly debriefing between community, subheadmen and headman
- Informal conversations with
    - Ward counsellor
    - Tsebo
    - Translator (Ben and Innocent)
    - Participants at Agriculture meeting
- Transect walk in the village
- PRA-methods
    - Ranking
    - Seasonal calendar
    - Group exercise on historical timeline
    - Wealth indicator
    - Yearly income graph
    - Homegarden mapping

Comment [LE1]: Er der ikke andre subheadmen interviews?

Appendix 3: Empirical data used in the different sections

SECTION	USED EMPIRICAL DATA
Presentation of Mpharane	• PRA session timeline • Informal conversation Ben Tenza • Informal conversation with Innocent • Informal conversation with Tsebo • Informal Conversation with ,Padi Ntsolo, Ward Councillor • Mapping of Tribal authorites by Tsebo.
Subsistence Farming and Livelihood Diversification	• PRA-sessions ranking of livelihood activities • PRA-session income graph • Questionnaires • Questionnaire interview with Nomthetheleli Tekete • Informal Conversation with ,Padi Ntsolo, Ward Councillor • Snowball interview with Nomnyamezeli Tenza • Snowball interview with Mamotsekuwa Mosehle • Snowball interview with Moses Golo • Semi-Structured interview with Norake Ntlhanakoe • Semi-structured interview with Ditabat Tenza • Semi-structured interview with with Matlatseletso Taoana • Informal conversation Ben Tenza
Agricultural Development Projects	• Questionnaires • Snowball interviews • Interview with Caswell Tenza, farmer who gave his field to AsgiSA • PRA-session on Historical Timeline with Abet Nigo, Maklosanaile Valashiya and Betram Moletsi. • Conversation with Ben Tenza, Key-informant
Environmental conditions	• Soil sampling • Observation • Semi-structured Interview with chairman/mentor Ms. Mabindisa Millicent about the community garden project. • **Interview with large farmer Thembivile Mbanga.** • Semi-structured interview with Norake Ntlhanakoe, Chairman of the Tractor Association • **Semistructured interview with Ditabat Tenza.** • **Snow ball interview with** Mamotsekuwa Mosehle.
Farming Practices	• Observation • Semi-structured interview with Norake Ntlhanakoe, Chairman of the Tractor Association • Semi-structured interview with Extention officers. • Seasonal calendar with Ditabat Tenza.

	• Seasonal calendar with Moses Golo
Land Access	• Questionnaires • Semi-structured interviews with, Norake Nthlahanakoe, Chairman from Tractor Association • Semi structured interview with Ditabat Tenza • Snowball interview with Thembivile Mbanga • Informal Conversation with ,Padi Ntsolo, Ward Councillor • Short interview with local Subheadman • Short Interview with Mosheshe Headman of Mpharane.
Financing	• Questionnaires • Snowball interviews • In-depth interview with Nomthetheleli Tekete • In-depth interview with Moses Golo • Semi-structured interview with Ditabat Tenza • Semi-structured interview with Nomzamo Ngidi, member of a Stokvel • Semi-structured interview with Norake Ntlhanakoe, Chairman of the Tractor Association • Semi-structured interview with Matlatseletso Taoana • Conversations with Ben Tenza, Key-informant
Market Access	• Questionnaires • Snowball interviews • Semi-structured interview with Caswell Tenza • Semi-structured interview with Ditabat Tenza • Semi-structured interview with Matlatseletso Taoana • Own observations • Informal conversation with Torben Birch-Thomsen • Informal conversation with Padi Ntsolo, the Ward Councilor in Ward 13 • Conversations with Ben Tenza, Key-informant • PRA-session on mapping use of maizefield with Matlatseletso Taoana

Appendix 4: Questionnaire Template

Name: _____
Age: _____
Sex: _____
No. in household: _____
Educational background: _____
Where is you outfield (map): _____
Waypoint (GPS): _____

1) Is your household farming an outfield this year?

If no in 1)
2) Do you have access to an out field?

Yes □ No □

If no in 2)
3) Have you ever had access?

Yes □ No □

If no in 3)
4a) Have you ever tried to get access?

Yes □ No □

If yes in 4a)
4b) who did you ask?

_____

Go to Question 9, 10, 30, 30a, 31 and 31 b

If yes in 3)
5) How did you get to use that field?

□ Family field
□ Shared with someone in village
□ Rented from someone in village
□ Rented from chief

6) Would you like to have access to an outfield again?

Yes □ No □

Go to Question 9, 10, 30, 30a, 31 and 31 b

If yes in 1)

Go to question 11

If yes in 2)
7a) Why are you not farming it?

7b) Is it ues by someone else?

Yes □ No □

If no in 7b)
7c) Why?

If yes in 7b)
8) What is it used for?

□ Grazing
□ Crops
□ Fallow

9) Do you sell anything from your homegarden?

Yes □ No □

10) Where do you sell it?

□ Village
□ Old age grant
□ Outside Mpharane

Go to Question 30, 30a, 31 and 31 b

Tenure

11) How did you get that outfield?

□ Family field
□ Shared with someone in village
□ Rented from someone in village
□ Rented from chief

12) Would you like to farm more land?

Yes □ No □

If yes in 12)

If no in 12) Go to 14)

13) Have you tried to extend your field?

Yes □ No □

Labour

14) Do you get help in farming?

Yes □ No □

15) Do you need more help in farming?

Yes □ No □

Market

16) Do you sell som of your crops?

Yes □ No □

If no in 16)

16a) Why?

□ Livestock feeding
□ Human consumption
□ Bad harvest
□ Difficult access

If yes in 16)

16b) Where do you sell it?

□ Village
□ Old age grant
□ Outside Mpharane

Growth Conditions

17a) What do you grow in your outfield this year?

□ Red/yellow maize
□ Yellow flat
□ Mixed
□ White maize
□ Yellow round
□ Beans
□ Marow
□ Pumpkin

18) What are your crops used for?

□ Livestock feeding
□ Human consumption
□ Market

17b) How many bags do you get pr. Maize field?

19) Where do you get your seeds from?

□ From last year
□ From the village?
□ Outside village

20) What is the color of the soil on your outfield?

Red □ Black □

21) What is the quality of your soil?

Good □ Medium □ Bad □

22) Do you apply pesticides in your field?

Yes □ No □

23) How big is the impact of pests in your field?

High □ Medium □ Low □

24) Do you apply kraal manure?

Yes □ No □

25) Do you apply NPK?

Yes □ No □

26) Do you use a tractor in your outfield?

Yes □ No □

If yes in 26)

27) Is it your own?

Yes □ No □

Finance

28) Have you ever borrowed money for farming your outfield?

Yes □ No □

If no in 28)
Go to 30a)

If yes in 28)

29) Where did you borrow money from?

□ Loan shark
□ Bank
□ Family/friends
□ Stokvel

Development projects

30a) Were you part of AsgiSA?

Yes □ No □

30b) What is your experience with AsgiSA?

Positive □ Negative □

31a) Are you part of the Mphatlalatsane Community Project?

Yes □ No □

31b) What is your experience with it?

Positive □ Negative □

Ranking exercise

32): Please rank these 7 income opportunities according to their importance to your household

33) Can we come back if we have further questions?

Appendix 5: Results from the ranking exercise conducted after each questionnaire

The categories for the rankings were written on flipcards and the categories were:

Crop farming – Homegarden – Money from family – Job outside own farming – Livestock – Governmental pensions – Private pensions

	1st priority	2nd priority	3rd priority	4th priority	5th priority	6th priority
Malaletesane	Job	Homegarden	Money from family			
Mangidi Ngidi	Gov. pension	Homegarden	Job			
Elisa	Gov. Pension	Private pension	Job	Homegarden	Livestock	Money from family
Molefe Moreheng	Gov. Pension	Homegarden				
Mabindisa Milicent	Job	Homegarden				
Makhahliso Maphela	Job	Gov. Pension	Homegarden			
Anna and Vuyelwa Bolofo	Gov. Pension	Money from family	Homegarden			
Nomthetheleli and Makoae Tekete	Gov. Pension	Job	Homegarden	Money from family		
Matshepo Ntsane	Gov. Pension	Homegarden	Livestock			
Nosayinile Mpeyi	Job	Livestock	Gov. Pension	Homegarden		
Nomasomi	Gov. Pension	Job				
Mamohale Mosenye	Gov. Pension	Homegarden				
Elisabeth Matsosa	Gov. Pension	Job				
Malenkwe Moeti	Homegarden					
Marithakoana Hlaki Alphonsina	Gov. Pension	Homegarden				
Setla thekiso	Gov. Pension	Homegarden				
Maditha Matata	Gov. Pension	Job	Homegarden			
Lulama Tenene	Gov. pension					

The ranking exercise was also conducted with respondents to snowballing interviews and other farmers who were interview.
Results are:

	1st priority	2nd priority	3rd priority	4th priority	5th priority	6th priority
Matlatseletso Taoana[4]	Private pension	Gov. pension	Livestock	Maize field	Turnip form Homegarden	Money from family
Caswell Tenza[5]	Child grant	Homegarden	Fishing			
Nomnyamezeli Tenza[6]	Gov. pension	Livestock	Private pension	Crop farming	Job outside own farming	
Mamotsekuwa Mosehle[7]	Livestock	Crop farming	Gov. pension	Job outside farming	Homegarden	
Moses Golo[8]	Livestock	Crop farming	Homegarden	Gov. pension		
Name[9]	Own business	Tractor	Crop farming	Livestock	Homegarden	
Ditabat Tenza[10]	Tractor	Private pension	Crop farming	Livestock	Homegarden	
Thembivile Mbanga[11]	Livestock	Crop farming	Homegarden	Gov. pension		

[4] Lady with homegarden
[5] Participant in AsgiSA
[6] Snowball interview 1
[7] Snowball interview 2
[8] Snowball interview 3
[9] Headman of Tractor Association
[10] Snowball interview
[11] Snowball interview 4

Appendix 6: Summary of answers to questionnaires

Question 1) Are you farming an outfield?

100 % of the 19 respondents were not farming an outfield

Question 2) Do you have access to an outfield?

12 does not have access to an outfield, 7 has access but is not farming

Question 3) have you ever had access?

6 said no, 6 said yes

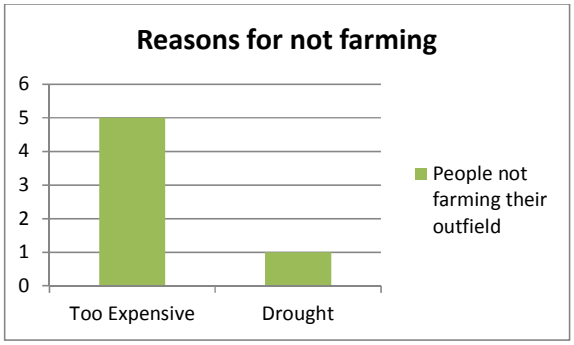
Question 4a) Have you ever tried to get access?

7 said no, 3 said yes

Question 4b) Who did you ask?

1 said the chief, 1 said the subheadman

Question 7a) Why are you not farming it?

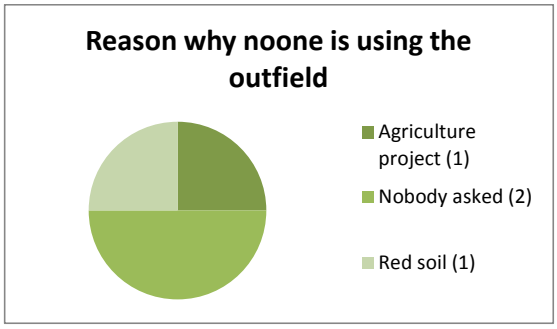


5 said it was too expensive, 1 said it was because of drought

Question 7b) Is your outfield used by someone else?

6 respondents said no, 1 said yes (and it is used for maize (question 8)

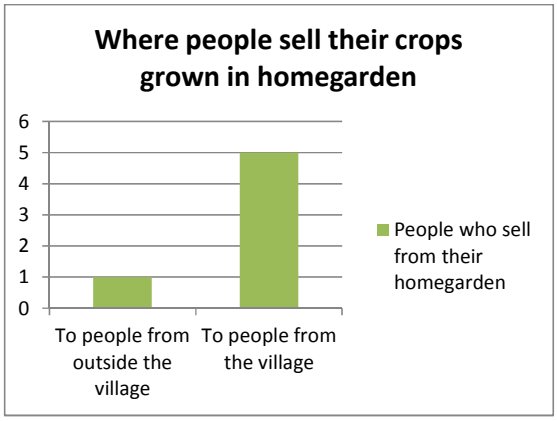
Question 7c) Why?



Question 9) do you sell anything from your homegarden?

14 said yes, 5 said no

Question 10) Where do you sell it?



Appendix 7: Interview guide for interview with chairman of the Community Project

1) Can you tell us about the project
2) What is your rolr?
3) Do you have a farming education?
4) Who started the project
5) Who is participating and how?
6) How is it funded?
7) What is the project used for?
8) What are the vegetables used for? – and the earnings?
9) How did you get access to the fields?
    a. How big is the land?
    b. Is it possible to increase the land?
    c. Do you wish to increase?
    d. Is there any specific reason why this area was chosen?
10) Are you applying fertilizer?
11) Are you applying pesticides?
12) Are you using tools?
    a. Who owns the tools
    b. How are they funded?
13) Which crops are growing there?
14) What are the risks in vegetable gardens?
    a. What do you do to minimize the risks?
15) Is the project popular in the village?
    a. Do people in the village wish to participate?
16) How does tis project differ from AsgiSA?

Farming in general:

17) Has crop farming increased or decreased in the last ten years?
    a. Is that constant?
    b. Why is it so?
18) Yesterday we learned that many people are not using their outfield, why do you think it is so?
19) What do you think should happen, so people would start using outfields again?
20) Can you mention the 3 largest constraints?
21) Do you see drought as a constraint to farming here?
22) Do you know if farmers are able to buy consultancy?
    a. Who works as agricultural consultants?
23) Are farmers here educated?

Appendix 8: Interview guide for interwiev with chairman of Tractor Association

About the association

When did the tractor association begin?

Who started it?

How many members are there?

Why was it started (the purpose)?

Does it cost something to be a member?

Chairman

Are you farming any outfields this year?

How many outfields do you have access to?

Where are they located?

How did you get access to these fields?

Would you like to have access to more land?

Government initiatives

Have you heard about the agricultural project initiated by the government?

What do you think about it?

Past 10-20 years

Do you have an impression of whether people used to farm more than today?

Future

Could you imagine farming more land?

What do you think will happen to the use of outfields in the 20 years ahead?

Do you think people will use thir outfields more or less?

How do you think the distribution of land will be in the future?

Market

Do you sell any of your crops?

Who do you sell to?

Do you sell at a market?

Work force

Do you get help in the fields?

- More help in specific seasons?
- Help from family?
- How many employees?

Constraints

Do you experience constraints?

- When producing crops/farming?
- When selling products?
- Climate/weather
- Soil quality

Tractor

Have you been farming more fields after you had a tractor?

What do you think is the most important resource when farming?

Why do you have 2 tractors?

When did you get a tractor?

How did you manage to afford your tractors?

Tractor Association – market based

Have you tried to get more land together?

Do you share information about farming?

How do you decide the price of the products that you sell?

Are the members exchanging information about the prices they receive for products they sell?

Do all members do crop farming?

When did the first tractor come to town?

Appendix 9: Interview guide for informal conversation with headman or subheadman on Wednesday Community meeting

1) How do people get access to miazefields?
2) How do people form outside village get access?
3) Who can get access?
4) Do you ever deny people access?
    a. Why?
5) For how long does the permission last?
6) Can people loose their rights to the fields?
    a. What would be the reason for that?
7) Who decides who can get access?
8) How is it decided?

Appendix 10: Classification of soils in Mpharane.

The red soil would seem to be an Ultisol at first. This a common soil in the southern Kwazulu Natal and northern Eastern Cape (Fox & Rowntree 2000) The soil is red because apart from iron and Aluminium, all other nutrients has been washed out of the soil (the red colour is gained from iron oxides). The soil is acid (Smith & Smith 2006). All this fits the problem is just that in order to be an ultisol, there needs to be a clay enriched b-horisont (Borggaard 2001).

The other possibility is an Oxisol. This soil is also red, and found in this area of South Africa (Smith & Smith 2006). This soils needs to have an oxic horisont, which also means an enrichment of clay, but this enrichment is more homogenized (Borggaard 2001). Therefore the red soil is probably an Oxisol.

The black soil is a vertisol. A vertisol is a dark clay soil found in areas with varying wet and dry periods. The dark colour is not necessarily organic matter. Agricultural management is very difficult because the soil is very sticky when wet and very hard when dry. These soils in the tropics generally have a big potential for increased yield if the soil management is improved (Brady & Weil 2002).

The brown soil is on the border between an alfisol and an ultisol, being distinguished by each other only through pH (5.5>pH = ultisol, 5,5<pH = alfisol). Due to the colour of the profile, the soil is more likely to be an alfisol (eventhough the pH could also imply ultisol).

Classifications of climate in Mpharane

Appendix 11: Climate classification for Mpharane.

The temparature data for the village of Mpharane are as shown on figure x.

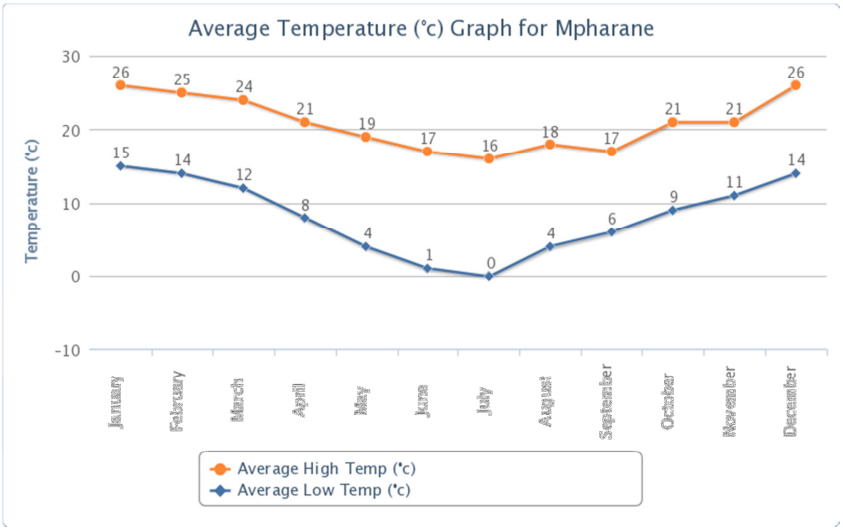


Figure x: Temperature data for Mpharane (World weather online 2013).

The precipitation data is shown on figure x.

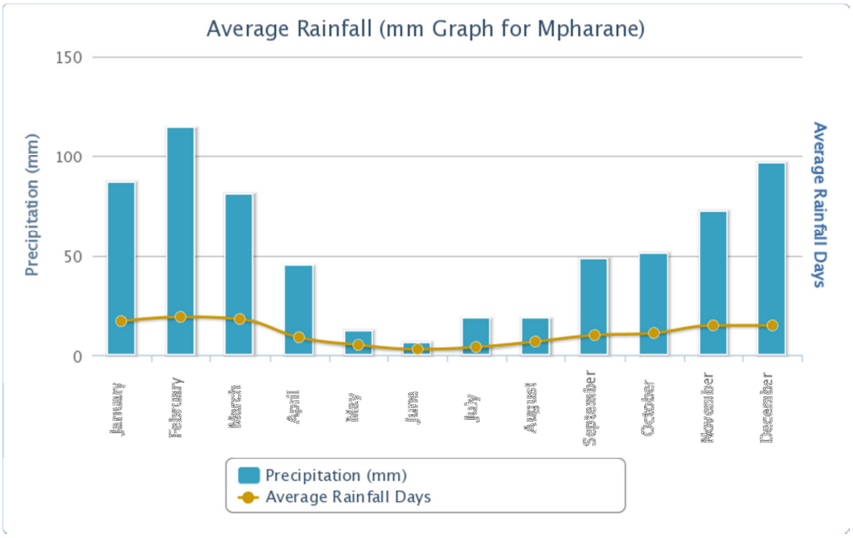


Figure x: Precipitation data for Mpharane (World weather online 2013).

Average annual precipitation in Mpharane is: 87+113+80+46+10+5+20+20+49+51+73+97=651 mm.

By the look of these figure there are two climate possilities according to Koppens classification. The first is a B – a dry climate (evaporation exceeds precipitation), and the next is C – temperate mild moist climate (coldest month >-3 C. Warmest month > + 10 C (Øgendal 2012).

First we will test whether it is a B climate. To assess whether the climate is B, first we need to calculated the precipitation threshold (that needs to be bigger than the precipitation in order for the climate to be B. It is obvious from the above figure that it is a dry winter climate (Since over 70 % of the precipitation falls in the 6 warmest months) we have to you the following formulae for calculating the precipitation threshold (Øgendal 2012).

$P_{threshold}=2* T_{annual}+28$ [cm]. (Øgendahl 2012)

We don't know the annual temperature so we will use this as the unknown and instead use the precipitation that we have already calculated.

65.1 cm$=2* T_{annual}+28$ cm <-->T_{annual} = 18,6 ˚C.

This is for sure higher than the possible average annual temperature when looking at the temperature data for Mpharane. This means that Mpharane falls into a C climate, and therefore that the climate is moist – not dry.

Appendix: 12 Soil samples and horizons.

A soil horizon was dug in order to indentify the different horizons in the soil, and to determine the depth of the water table in the soil or rocks. Soil samples to determine the soil bulk density were taken from the middle of the different soil horizonts to get as much variation as possible, therefore they were not taken in a predetermined depth. Additionally, soil samples were taken with an auger in 3 different depths 2 different places in the outfield. These samples were taken from depths of 0-10cm, 20-30 cm, and 40-50 cm. The samples were dried and retained in plasticbags until the analysis were carried out.

After the soil samples had been taken they were dried in an oven. The pH and texture was estimated by using the procedures outline in the course material (Soil analysis n.d.)