CAN WE GET THEM THERE?
A CASE OF COMMERCIALIZING ARABLE FARMING AT RUST DE WINTER FARMS OF LIMPOPO PROVINCE, SOUTH AFRICA

Opportunities for commercial agricultural production for Rust de Winter farms, in recognition of limited irrigation water

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ABSTRACT

The study was conducted on the Rust de Winter farm in the Waterberg District of Limpopo Province, to identify opportunities and possibilities for commercialising crop production within the Rust de Winter farms. The Agricultural Research for Development (ARD) procedure developed by the International Centre for development oriented Research in Agriculture (ICRA) was followed throughout the study. The farm consists of a great diversity in agricultural potential, due to different soil types, access to water and grazing capacity. Although the soils on the farm are part of 13% of South Africa's best soils, there was very little crop production, due to the limitations in irrigation water and unreliable rainfall patterns.

Different development strategies to address the problem of decreasing crop production were screened by the team and subsequently prioritized through workshops where all the stakeholders involved in the study participated. The strategies were screened to verify their validity, feasibility and practicality. Prioritization of the strategies was done with help of certain criteria.

The study recommends that the land claim issue be resolved so that possibilities for allocating more water can be pursued. This will provide or attract appropriate investments into the development of the farms such as revitalising boreholes and rehabilitating the irrigation system. Specialised capacity building is an essential factor in providing appropriate knowledge for the farmers. The farm has potential with regard to producing high value crops if more water can be made available, even though the request for more water should be supported by factual information on the effective and efficient usage of the already allocated water quota for the area. If additional water cannot be allocated then mixed farming may be the appropriate option for the optimum utilisation of the farm resources of the present livestock and dryland cropping enterprises.

For implementation of the recommendations, there must be proper collaboration among the stakeholders and the Limpopo Provincial Department of Agriculture (LPDA) to fully engage relevant personnel for guiding the farmers through the process.

PREAMBLE

The International Centre for development-oriented Research in Agriculture (ICRA) is a capacity building organization, with an excellent knowledge infrastructure for agricultural research. Its mission is to facilitate hands-on learning of professional skills needed to address complex problems in sustainable rural development. In the process of designing a training programme, ICRA has developed an Agricultural Research for Development (ARD) procedure. This procedure integrates the contributions of different disciplines, institutions and stakeholders into the analysis of complex rural development problems and into the design of action plans to address these problems.

The South African participants of the 2005 ICRA training programme are from rural development and research organizations and universities. They are from different institutions (inter-institutional) and have different fields of specialization (interdisciplinary), which is part of the ARD procedure applied by ICRA. ICRA aims at strengthening the capacity of the participants and their organizations to provide training (*Building Capacity to Build Capacity*). Participants are therefore expected to use the knowledge and experience gained during their knowledge acquisition phase in Wageningen, the Netherlands, as a basis for the training tools they will be using in their countries in training other stakeholders in ARD.

As a means of putting theory into practice, the participants conducted an in-country field study in South Africa, where they were focusing on the livelihoods on the Rust de Winter Farms, Limpopo, South Africa. The central question the team was tackling was *"What opportunities are there for commercial agricultural production on Rust de Winter Farm, in recognition of the limited irrigation potential?"* As their system of interest, the team has focused on arable farming in the area, looking at opportunities for commercial crop production. Through the field study, the team had an opportunity to use participatory approaches and put into practice the skills and tools they had been exposed to, in a real life situation. In short, participants applied the ARD procedure in an interdisciplinary team, dealing with an actual problem in the field.

ACKNOWLEDGEMENTS

The South African 2005 ICRA team would like to express their gratitude towards a number of people who contributed to this field study output. But first of all we would like to thank ICRA for giving us an opportunity to get experience in participatory research, something that was new to some of the team members. We learnt how to do 'business unusual' and are very eager to put what we learnt during the whole programme into practice in our country.

We are grateful to the Limpopo Department of Agriculture for hosting this study. Special mention should be made of staff members at the Towoomba Agricultural Research Station, i.e. Ms Alinah Mpe, Dr Jorrie Jordaan and Mr Johannes Bodirwa (our driver), for taking care of the team and providing excellent accommodation and logistic support throughout the field study.

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The team appreciates the assistance received from different stakeholders: Governmental departments in the province (Agriculture, Water Affairs & Forestry and Land Affairs), local supermarkets (Spar & Pick 'n Pay), the Noord Transvaal Kooperasie (Warmbaths and Settlers), Marble Hall Fresh Produce Market, the Land Bank, RESIS and commercial farmers Messrs Andre Hayden, Prinsloo and Willem Basson. Thanks are also due to our key informants whose knowledge of the farm helped the team understand the problem even better. The key informants are: Messrs Gideon Sithole and Robbie Robinson.

Te final editing of the report was done by Saskia Vleer. Finally the team extends its sincere and deepest gratefulness to the ICRA reviewer, Dr Driek Enserink, for his mentorship and motivation throughout this study. His suggestions and guidance were highly valuable.

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List of abbreviations and acronyms

ARC	Agricultural Research Council
ARD	Agricultural Research for Development
BBMSC	Bela-Bela Municipality Service Centre
CASP	Comprehensive Agricultural Support Programme
CIAMD	Chair in Agricultural Marketing and Development
DLA	Department of Land Affairs
DR&E	Directorate Research and Development
DWAF	Department of Water Affairs and Forestry
GPDA	Gauteng Provincial Department of Agriculture
ICRA	International Centre for development oriented Research in Agriculture
ISCW	Institute for Soil, Climate and Water
LPDA	Limpopo Provincial Department of Agriculture
LRAD	Land Redistribution for Agricultural Development
MCA	Madzivhandila College in Agriculture
MHFP	Marble-Hall Fresh Produce
NTK	Noord Transvaal Kooperasie
RESIS	Revitalization of Small Irrigation Schemes
STK	Suidelike Transvaal Kooperasie
TARS	Towoomba Agricultural Research Station
TSCA	Tompi Seleka College of Agriculture
UFH	University of Fort Hare
UFS	University of the Free State
VOPI	Vegetable and Ornamental Plant Institute

EXECUTIVE SUMMARY

Background and justification

The study focuses on the Rust de Winter farm in the Waterberg District of Limpopo Province. The area is characterised by dry and wet cycles, but a very dry year can be expected at least once every 10 years. The general conditions imply that dryland agriculture is risky, and planning is required to lower the risk. The farm is characterised by a great diversity in agricultural potential, due to differences in soil types, access to water and grazing capacity.

In the past, a great variety of crops was produced in Rust de Winter. This has however gone down, with more farmers focussing on livestock farming, due to the limited availability of irrigation water and unreliable rainfall patterns. This study was undertaken to identify opportunities and possibilities for commercializing crop production on the Rust de Winter farms, resulting in improved household livelihoods through a viable crop production system, processing mechanism and access to markets.

Based on the decreasing crop production problem, the study was justified with the following specific objectives:

- Analysis of the current livelihood systems of the target area population that utilise farms at Rust de Winter in order to develop an initial farm typology for better targeting of future development efforts.
- Analysis of the past and expected changes in the farming practices among the Rust de Winter farmers, specifically in relation to the decrease in availability of irrigation water and the effects of land tenure and land claims.
- Identification of potentially relevant farming and marketing practices for Rust de Winter farmers.
- Identification and prioritization of relevant development strategies for future activities.

Methodology

The study followed the Agricultural Research for Development (ARD) procedure developed by ICRA. The procedure includes the organization of a multidisciplinary team, the clarification of the problem in its development context as well as the identification of new development strategies. The procedure involves frequent interaction with all relevant stakeholders to bring about sustainable development.

The overall research process comprised of a reconnaissance survey in which a number of selected topics were explored that were particularly useful to increase the team's understanding in relation to the problem of decreased crop production. A farm typology was developed to facilitate the efficiency and relevance of the data collection process as well as to better target the future development strategies. The typology comprised of four farm types: irrigated crop production, dryland crop production, livestock production and mixed farming

Primary data collection methods included visits to the farms and other relevant stakeholders. The first phase comprised of: a reconnaissance survey and key informant interviews to explore stakeholders' perceptions on the causes of the problem and the possible solutions. The second

explanatory and verification visit used group discussions with representative farmers of specific farmer types. The team also ranked the causes of decreasing crop production as perceived by farmers belonging to the farmer types.

Different development strategies to address the problem of decreasing crop production were screened by the team and subsequently prioritised in workshops where all the stakeholders involved in the study participated.

Key findings

Typology

Four types of farmers were identified for the purpose of this study: crop (irrigated), crop (dryland), livestock and mixed farming. These farmers were affected differently by the problem and as such different strategies were put forward to address the problem, under different scenarios. For farmers involved in irrigated crop production, a strategy was identified that would improve availability of irrigation water. Those under dryland had to produce drought-tolerant crops, to accommodate unreliable rainfall. Livestock farmers needed a strategy that would ensure efficient use of the available grazing lands and other intensive systems such as feedlots. Farmers in mixed farming needed a strategy that would ensure integration of the two enterprises, resulting in mutual benefit.

Causes of decreasing crop production

There was very little crop production happening on the farm. The reasons given for the situation included: erratic and unreliable rainfall, inadequate water for irrigation, lack of security of land tenure and limited support services. The inadequacy of water led to many crop fields being left fallow and just being used for grazing purposes, leading to many farmers shifting to livestock production, which presented less risk than crop production under the circumstances.

Relevant stakeholders

Three governmental departments (LPDA, DWAF and DLA) had a major impact on the wellbeing of the Rust de Winter farmers. There were allegations of power play among these departments, which led to delays in decision-making on issues that were vital to the farmers, such as allocation of more water for irrigation and security of land tenure.

Driving forces and future scenarios

Ten driving forces for future scenario development were identified. These were: National Water Act, Land Policy; markets; non-agricultural employment; partnerships; knowledge; technology; natural resources; climatic changes; availability of finance and farmer indebtedness as well as diversification. Taking driving forces into consideration helps to ensure that the factors likely to thwart efforts being made are properly addressed and included in the planning. It was found that there are many such factors in Rust de Winter, hence the need to review them in detail, for proper analysis and planning.

Prioritization of development strategies

The analysis of the system of interest focused on arable farming for different types of stakeholders affected by the problem. Stakeholders need different research and development options due to their varying capabilities, resource endowments, livelihood strategies, interests and vulnerabilities. The strategies were screened to verify the validity, feasibility and practicality thereof. Through screening, the prioritizing of the strategies was dealt with, when recognizing the criteria for the screening process.

1. INTRODUCTION

1.1. Context of the study

Commercializing crop production is an important development option for the 'second economy'(resource poor farmers) in the agrarian land reform programme in South African agriculture. The Agricultural Research for Development (ARD) procedure is a tool used to investigate opportunities and constraints available for economic empowerment to rural farming households. The ARD procedure is used to explore opportunities available for improving the livelihoods of rural farming communities. Commercializing crop production at Rust de Winter farms is one of the many interventions that the South African decision-makers on agricultural activities are trying to pursue. The proposal for commercializing crop production was put across by the Limpopo Provincial Department of Agriculture (LPDA) together with the Agricultural Research Council (ARC) after realizing that the problem was complex and beyond one discipline and/or institution. LPDA and ARC then developed the terms of reference (TOR) outlining a problem situation, which warranted collective action. They forwarded this problem to the International Centre for development oriented Research in Agriculture (ICRA) as a research topic for the field study of the 2005 Anglophone Programme.

The arrangement of this report follows the ARD approach as the ARD phases were used in carrying out the research. This report comprises nine chapters. Chapter 1 outlines the background of the study specifying institutional framework, justification and objectives of the study. It also outlines the focus of the study. Chapter 2 describes the historical background of South Africa, previous interventions, geographical information, climatic patterns, topography and population. Chapter 3 discusses the methodology used to collect data, how the field data was analysed and how conclusions were drawn. These steps include: context analysis through the development focus of the study, development of strategies and priority setting to the development of research proposals. Chapter 4 describes the socio-economic status of the study area. Chapter 5 and 6 present and discuss findings on issues of commercializing crop production and market possibilities as well as stakeholder analysis on Rust de Winter farms. Chapter 7 describes the expected future scenario and its driving forces. Chapter 8 presents the prioritized development strategies and Chapter 9 concludes with the possible development actions for future improvement of the farms.

All identified key stakeholders were involved throughout the research. A final workshop was held at the end of the study by which key stakeholders assumed ownership of the research process, findings, and recommendations.

1.2. Organizations involved

The field study on the Rust de Winter farms was carried out as a joint project by the following institutions: the Limpopo Department of Agriculture's (LPDA), Directorate of Research and Extension (DR&E), the International Centre for Development-oriented Research in Agriculture (ICRA), the Agricultural Research Council (ARC), the Provincial Department of Water Affairs & Forestry (DWAF), Waterberg District Management (WDM) and Bela-Bela Municipality Service

Centre (BBMSC). Other institutions taking part were Tompi Seleka College of Agriculture (TSCA), Madzivhandila College of Agriculture (MCA), University of Free State (UFS), University of Fort Hare (UFH) and Towoomba Agricultural Research Station (TARS).

Besides the above listed institutions, other parties likely to benefit from the field study were the National Department of Agriculture (DOA) and district offices in Waterberg, municipalities, the Gauteng Province, Non-Governmental Organizations (NGO) and service providers operating in the province.

1.3. Beneficiaries

Primary beneficiaries of the findings are Rust de Winter households involved or interested in crop and livestock production business. Secondary beneficiaries are all the other stakeholders involved in the study.

1.4. Problem statement

The study formed part of the LPDA's initiative to develop a stable agricultural environment for farmers on the Rust de Winter irrigation scheme, to ensure that they are financially successful. Seeing that a number of planning actions had already been taken previously, without any success, the ICRA study was suggested. The study would allow an independent, objective overview of the situation, to provide a realistic assessment of the area's farming potential. There was also a need for guidelines on how to revitalise the farm and as such have people making efficient use of the land, instead of just occupying the land without any production activities taking place.

1.5. Objectives of the study

The overall objective of the study was to identify opportunities for sustainable commercial crop production, taking the limited irrigation potential into account.

The specific objectives were:

- To analyse the current livelihood systems of the target area population that utilise farms at Rust de Winter in order to develop an initial farm typology for better targeting of future development efforts.
- To analyse the past and expected changes on the farming practices among the Rust de Winter farmers, specifically in relation to the decrease in availability of irrigation water and the effects of land tenure and land claims.
- To identify potentially relevant farming and marketing practices for Rust de Winter farmers.
- To identify and prioritize relevant development strategies for future activities.

1.5.1. Goal

The goal of the study is to have improved livelihoods for the Rust de Winter farm households of Waterberg District in the Limpopo Province.

1.5.2. Purpose

To identify opportunities and possibilities for commercializing crop production within the Rust de Winter farms of Waterberg District in the Limpopo Province of South Africa, resulting in improved household livelihoods through a viable crop production system, processing mechanism and access to markets.

1.5.3. Expected outputs

At the end of the study, the team was expected to have achieved the following outputs:

- Identified potential commercial arable production opportunities
- Benchmarked the possible use of agro-ecological resources
- Identified potential feasible collaboration between local agricultural institutions and commercial farmers with the Rust de Winter farmers for marketing and mentorship.
- Identified and prioritized strategies for developing the Rust de Winter farms.
- Identified potential market outlets for Rust de Winter farmers.

1.6. Focus of the study

Through a contextual analysis, the macro trends and the stakeholders that have a common interest in finding a solution to the problem were identified. The team decided on what should be the relevant focus of the study, within which the interests of the client would be properly reflected. Due to this focus, a further demarcation was developed to determine which topics and stakeholders were inside or outside the framework of the study.

The system of interest in this study was *"Active and sustainable utilization of resources and exploitation of opportunities can make farmers commercially viable at Rust de Winter farms"*. The study explored development opportunities for sustainable commercial crop production.

1.7. Research questions

The study is focused on answering the following research questions:

- What livelihoods exist in the Rust de Winter farms?
- What opportunities for succeeding in agriculture can be identified?
- What are the determinants for successful agricultural production?
- What marketing strategies are needed for commercial production?
- What policy implications are there for commercial production?
- What are the limitations to commercial viability in Rust de Winter farms?

The secondary and tertiary questions that are derived from the primary ones are shown under the research plan (Appendix 2) of the report. The plan also indicates the information needs as well as the methods selected in finding potential answers to the questions.

2. BACKGROUND AND CONTEXT OF THE DEVELOPMENT PROBLEM

2.1. Background of South Africa

2.1.1. Farming context (historical)

South Africa (SA) occupies the very southern part of the African continent. The total surface area is 122.3 million ha. The country has nine provinces with Limpopo Province (far north) covering 11.8% of the total land area. About 2000 years ago, farming was introduced into SA by Bantu-speaking people who originated from Nigeria/Cameroon. The first farmers practiced mixed farming by herding cattle, sheep and goats and also cultivating sorghum as well as millet using iron hoes. Domestic animals were sources of meat and milk and were considered a form of wealth (ICRA, 2003; ICRA, 2004).

Between the 19th and 20th centuries African agriculture had problems. Gradually Africans lost access to land as white proprietors capitalised their holdings. In 1948, the National Party introduced apartheid policies that segregated African ethnic groups from one another (and from the ruling white minority). The Native Authority Act of 1951 and the promotion of Bantu self Government Act No. 46 of 1951 created eight national units, the boundaries of which coincided with the reserve boundaries defined by the Land Act (ICRA, 2003).

In 1954 the Tomlinson Commission was concerned that quality of the land in the reserves could not support the high number of African families in those areas. This Commission proposed drastic changes for the homelands resulting in a series of betterment or closer settlement schemes to stop soil degradation through land use planning, relocation of people and livestock, stock culling, fencing, contour ploughing, water conservation and erosion control (ICRA, 2004).

The Bantu Homelands Citizen Act was passed in 1970, making every African a citizen of some homeland. The Bantu Laws Act of 1972 justified forced resettlements of African people and stated that a “Bantu tribe” community or individual could be removed from where they lived without any recourse to parliament, even if there was some objection to the removal. Land was then held communally in the homelands (defined by proclamation R188 of 1969). From 1976, the independence of a number of homelands did not have a major influence on tenure patterns and communal arrangements (ICRA, 2004). This changed after the country’s first democratic elections in April 1994.

2.1.2. Current state of South African agriculture

According to Botha, Hallatt and Van Schalkwyk (2004) agriculture plays a relative small role in the South African economy, but provides for the basic human needs. Nevertheless, it plays a major role in providing an acceptable economically, politically and socially stable environment to the South African society. Agriculture in South Africa contributes only 3.4% to the total national output. This does not however reflect the true importance of the agricultural sector and its impact on economic growth. In a country like South Africa, with an increasingly diversifying economy, the contribution of agriculture as a sector will decrease in percentage over time, even though the level of production in absolute figures increases. In 1911 agriculture contributed 21% to the GDP

(Gross Domestic Product) but it dropped to 5% in 1985 and finally to 3.4% in 2003. The nominal value of production in 1911 was R63 million, R5 844 million in 1985 and is currently estimated at R66 046.2 million.

According to Van Rooyen (1997) agriculture contributes both directly and indirectly to economic growth. The direct contribution is reflected by the relative small proportion of the GDP and employment. However the indirect contribution through agriculture's linkages and multipliers is large. The agricultural sector plays a complementary, albeit vital, role in the economic growth and development as well as in food provision in South Africa. Food and high value crops generate valuable foreign exchange earnings.

One of the most essential roles of agriculture is supplying food to the consumer at an affordable price. Agricultural production in South Africa has increased on average at a rate of 3.4% annually since the 1980's, while the population has increased at an average rate of 2.6%. This means that South Africa's requirements of food can be met. The country's private consumption expenditure on food in 2002 was R128 757.8 million, which is 69% of total private consumption expenditure (CIAMD, 2002).

In South Africa agriculture plays a leading role in earning foreign currency. Agriculture forms 8% of total exports and 5% of the total imports. The agricultural sector exports almost twice the value of products it imports. With the recent appreciation of the Rand and low agricultural production due to drought, imports will increase (Botha, et al, 2004).

According to ABSA (2002), agriculture, forestry and fishing account for 11.2% of the country's employment. The agricultural sector is highly dependent on low-paid unskilled labour. Incorporation of minimum wages and the guarantee of occupational rights to farm labourers are mentioned as the major changes in labour legislation affecting agriculture. The agricultural sector will eventually move away from labour intensive production, and focus more on highly advanced technologies, and more capital-intensive production. According to Van Schalkwyk and Botha (2003) there has always been a significant correlation between economic growth and the economic welfare of the consumer, i.e. the more favourable the economic growth; the more consumers spend on consumables. This would indicate that a higher economic growth would increase the consumption of agricultural products, especially those with a high income elasticity.

Agriculture has changed radically in recent years. It was formally a highly regulated sector with subsidies and financial concessions available to farmers, often at high economic costs. The agricultural markets have since been liberalized and access to them broadened. Fiscal and monetary policy also underwent many changes, which influenced the agricultural sector of South Africa in various ways (Botha, et al, 2004).

2.1.3. Agriculture in the Limpopo Province

The Limpopo Province is divided into six districts, namely Vhembe, Capricorn, Sekhukhune, Mopani, Bohlabela and Waterberg. The total area of the province is 12 460 000 ha (Limpopo Department of Agriculture, 2005b) of which 10 548 290 ha (88.2%) constitute farm land with 14.7% and 14% of the total constituting arable land and commercial agriculture respectively. The area under irrigation in the Limpopo Province is 135 000 ha (10.5% of the SA total). There are

about 167 government-developed schemes serving small-scale farms, covering 47 780ha (Nesamvuni et al., 2003).

Agriculture is the flagship of the economy for the province. It can be divided into three broad sub-sectors namely commercial, emerging commercial and subsistence farming. It contributes approximately 15.2% of the Gross National Product and 10% of the National Agricultural Production. Tobacco, sunflower, cotton, maize, and peanuts are crops cultivated in this district and they contribute 25% of the total farm income. About 41% of the province tobacco and 50% of the province cotton are produced from this district. Because of its large area for grazing, Waterberg has an extremely significant contribution to the production of red meat and game industry (De Klerk, 2003). Animal production contributes 51% of the Gross Agricultural Income, followed by horticulture (32%) and field crops (26%), while forestry and others contribute 0.2% (Nesamvuni et al., 2003).

A large area of the province is prone to frequent drought and most of the farming activities by the small-scale farmers are dependent on rain. Research is constantly focusing on searching for appropriate drought tolerant crops and new techniques, which best minimize the effect of drought on crop production.

2.1.4. Waterberg District and Rust de Winter

Geographical Location

The Waterberg District is the largest in the Limpopo Province and is located in the western side of the province. The total surface area is 4 951 881 ha (Nesamvuni et al., 2003) with the largest area of arable land (1 220 900 ha). Figure 2.1 illustrates the location of the Waterberg District Municipality within Limpopo Province.

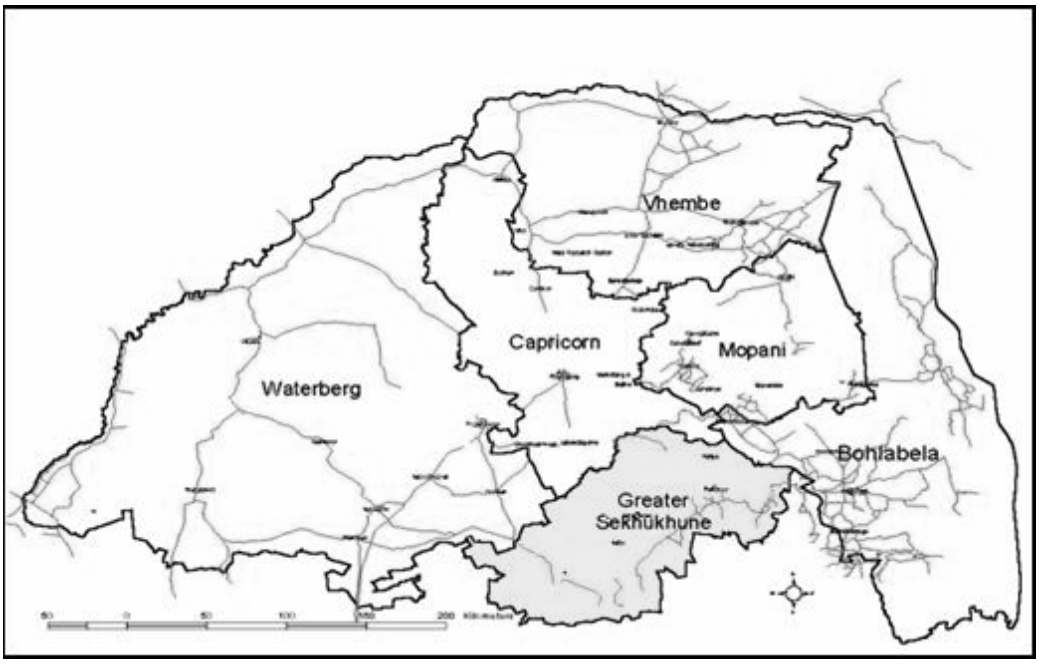

Fig 2.1: Map of Limpopo Province

The Waterberg District Municipality consists of the following local municipalities: Mogalakwena, Bela-Bela, Modimolle, Mookgopong, Lephalale and Thabazimbi. The district is rural in nature with the urban areas mostly described as dispersed and fragmented (De Klerk, 2003). The study area is the Rust de Winter farms which fall under Bela-Bela Municipality. The farms occupy about 38 000 ha, with 12 000 ha falling under the Limpopo Province and 26 000 ha falling under Gauteng Province.

Climate

The climate in Rust de Winter is hot and dry with an annual rainfall of about 600mm and a high evaporation rate. Rainfall is predominantly in summer with an estimated average range of 20.8 to 123.3mm between September and April, and 3.7 to 7.8mm between May and August. Rainfall is unreliable with at least one year in two drier than the average. The area is characterised by dry and wet cycles, but a very dry year can be expected at least once every 10 years. The general conditions imply that dryland agriculture is risky, and planning is required to lower the risk. The average evaporation rate per day ranges from 3.6 to 5.5 between April and August, and from 6.0 to 8.0 between September and March (see Table 2.1). The average minimum temperatures range from 2.2 to 6.0oC from May to August and 9.0 to 16.7oC from September to August. The average maximum temperatures range from 20.2 to 23.04oC from May to August, and 26.7 to 29.6oC from September to April.

Table 2.1 Climatic data for Rust de Winter

	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
Ave. max T	29.4	29.0	27.9	25.4	23.0	20.2	20.6	23.4	26.7	28.1	29.3	29.6	
Ave. min T	16.7	16.4	14.6	10.8	6.0	2.2	2.4	4.6	9.0	12.8	14.8	16.0	
Ave rainfall	117.6	92.1	69.2	38.2	6.5	7.8	3.7	6.0	20.8	38.5	99.2	123.3	622.9
Ave evap./day	7.5	6.6	6.0	4.7	4.3	3.6	4.0	5.5	7.5	8.0	7.7	7.8	
Ave sun hrs	8.5	8.6	8.4	7.9	8.7	8.7	9.1	9.4	9.3	9.1	8.5	8.6	
Total wind	3917	3311	3225	2893	2831	2972	3258	4268	4768	5403	4811	4268	

Approximately 10 frost days can be expected each year with occasional black frost that can cause severe damage.

Topography

In the western part of Rust de Winter farm are Drakensberg escarpment and Soutpansberg Mountains located, with steep slopes and peaks that rise to 2000 metres. The Waterberg and Blouberg mountains are undulating to very steep terrain and reach altitudes of between 800 and 1000 metres. During the rainy season there is an abundance of running streams and rivulets in the veld.

Soil types and vegetation
Soils are good red sandy loams falling in the Hutton form, ranging from a Shorrocks series to a Makatini series (the clay contents range from 15 to 35%). The pH of the soils is slightly acidic to neutral with most soils high in lime. The Waterberg sensitive areas within the district are mainly the wetlands habitats that include rivers and riverine vegetation. The dominant grass species are Buffalo grass and Smuts finger grass. The farm consists of a great diversity in agricultural potential, due to different soil types, access to water and grazing capacity.

Population
The Waterberg district is mostly inhabited by Black (Tswana, Pedi and Ndebele), White (Afrikaans) and Indian people. The total population of the district is 623 354 within an estimated 117 659 households. About 36.4% of the population is unemployed and 42.1% of the population consists of young people (14 years and younger).

2.1.5. Historical background of Rust de Winter Irrigation Scheme

The history of the Rust de Winter Farms dates back to the 'Voortrekker days' in the 1800's. The first farmers (Voortrekkers) discovered and utilized the natural pastures for their excellent winter grazing potential, hence the name Rust de Winter. The Rust de Winter irrigation scheme was developed for commercial arable production and water was sufficient during that time.

In 1981 and 1982, the white commercial farmers were bought out by the then government which appointed Suidelike Transvaal Kooperasie (STK) to maintain the farms, until its withdrawal in 1992 due to political pressure. STK appointed managers mostly from foreign countries such as Zimbabwe, Zambia, Mozambique and Botswana. After the withdrawal of STK, land invasions took place.

In 1992 the Rhenosterkop Dam was constructed lower down stream on the Elands River, due to increasing water demand for household consumption. The water available for irrigation purposes was drastically reduced.

2.2. Recent developments in the Rust de Winter farm

Several development activities took place years after the white farmers were bought out by government from the Rust de Winter farms. In 1994 the land occupation was legalised through the allocation of lease agreements.

2.2.1. Farm demarcation

In 1994, the Rust de Winter farm was officially demarcated into two farms - one for the Gauteng Province and the other for the Limpopo Province. Before the demarcation, the Department of Agriculture in Gauteng Province had been responsible for providing extension services and guidance to all the Rust de Winter farms. But after the demarcation, each province became responsible to offer services to its farmers. In the Limpopo Province, the farm was further divided into portions ranging from 10ha to more than 200ha.

2.2.2. Farm ownership

The farmers on lease contracts have recently applied for the ownership of their leased land through the Land Redistribution for Agricultural Development programme (LRAD). The Department of Land Affairs is currently processing their applications. The LRAD programme is designed to help previously disadvantaged citizens from African, Coloured and Indian communities, to buy land or agricultural implements. Beneficiaries enter projects at various level of production, such as safety-nets projects, equity scheme, production for markets and agriculture in communal areas (Department of Land Affairs, 1998). At this stage, the pending outcome of the land claims withholds the 'option to purchase' process.

2.2.3. Financial support

To carry out agricultural activities, some farmers applied for credit from the Land Bank. The bank is mandated for financing agricultural development, in terms of granting loans to farmers. The amount of loans given to farmers depends on the type of collateral that the farmers have as security – those who don't have collateral can only get up to R25 000 loan. Since the farmers are still on leased land, the loan amount being given to the farmers is insufficient for undertaking agricultural activities. The Department of Land Affairs revised the lease agreement from a year to five years to enable farmers to easily access the credit.

The farmers complained that the money from the Land Bank is granted late during the planting season causing them to plant very late, thus affecting the quality and yield and hence profit. As a result of low profits, farmers cannot repay the loans as agreed, resulting in accumulation of debts. Sometimes farmers allegedly utilise most of the money for household purposes and very little for agricultural purposes, making repayment even more difficult.

Some farmers are financially sustainable from other off-farm employment which contributes substantially to their income. These farmers are either self - employed, or government employees and spend most of their time off the farm.

2.2.4. Access to extension services

After the demarcation of the farm, the farmers in the Limpopo Province had to access technical services and advice from the agricultural office at the Bela-Bela sub-district. The farmers, however, experience difficulties in accessing these services due to staff shortage at this office. One extension officer is responsible for the whole Bela-Bela sub-district of which Rust de Winter farm is part. His responsibility includes: service delivery to the farmers on crop production, animal production, soil management and engineering.

Farmers indicated that they have a problem with controlling diseases of their livestock due to lack of knowledge in animal health. There are no veterinary services on the farm, as such farmers have to use the guidance provided by the extension services. This problem poses a threat to their livestock since some diseases require immediate veterinary attention.

2.2.5. Water allocations

The Limpopo Province is prone to frequent drought and most of the farming activities by the smallholder farmers are dependent on rain. In order to continue with profitable agricultural production on the farm, DWAF allocated water for irrigating a total of 165ha on the farm with each crop farmer having a quota for irrigating only 5 hectares on his farm portion. The determination of quotas depends on the level of water in the dam, which is determined by rainfall. The livestock farmers are not provided water quotas for livestock consumption. The irrigation water being allocated is not sufficient for crop farming.

The DWAF indicated that the farmers do not have the power to claim more water because they do not have a license for water rights. It is difficult for farmers to acquire a water license because they do not own the land. It was further mentioned that there is a power play going on between the DWAF, LPDA and LDLA, on how and who decides on the allocation of water. However, the DWAF suggested that LDLA and LPDA could apply for licenses and carry water rights on behalf of the farmers. This would reduce the logistics and administrative hassles for the farmers.

The most consistent and reliable water source is that from the Rust de Winter Dam. The dam is located in the Elands River. According to DWAF, the Rust de Winter Dam has a total capacity of 26 million m3, of which 1.5 million m3 can be distributed for crop irrigation in the Rust de Winter area. The Rhenosterkop Dam is downstream from the Rust de Winter Dam, on the Elands River. This dam contains 200 million m3, of which 16 million m3 comes from the Rust de Winter Dam and serves the household and industrial needs of that area.

Another water source in the area are the boreholes, though most of them are not in working condition. Water from these boreholes has a high fluoride content, which makes it unsuitable for human consumption.

2.2.6. Infrastructure and resources

During evacuation, white farmers allegedly stripped and damaged boreholes, canals and all other farm infrastructure. This implies that resource poor farmers that have since settled in the area have experienced difficulty in getting to the same level of productivity as the previous farmers. The damaged fence exposes cultivated crops to roaming livestock and wild animals. The electricity infrastructure is too expensive to repair, making it difficult to pump water from the boreholes to supplement water from the dam.

The LPDA has initiated an integrated revitalization of the 167 provincial irrigation schemes for a period of six years, which would be of great benefit to the Rust de Winter farmers. The programme provides the following benefits:

- bulk water supply in the irrigation schemes
- rain water harvesters
- stock watering systems
- training and capacity building for farmers
- institutional arrangements and structure in the form of Water Users Association or any other appropriate institutional structure in the irrigation schemes

- dryland farming support and
- facilitation for mechanization services.

2.3. Interventions on the Rust de Winter farms

2.3.1. Vegetable project

The Gauteng Department of Agriculture together with the ARC - Vegetable and Ornamental Plant Institute (VOPI) initiated a Provincial pilot vegetable project under irrigation on the farm. The project included the cultivation of *Amaranthus*, cabbage, onions, pumpkins and potatoes. The project was well managed but the problem emerged when the products were ready for the market.

The Pretoria Fresh Produce Market was then dominated by white agents and the produce from black farmers was considered late after the white farmers produce had been bought, leading to failure of this project.

2.3.2. Commercial - local farmer partnership

In 2002, a white commercial farmer from Settlers formed a partnership with some of the farmers on the farm for crop production. The initial contract was for a year, but he then extended it to five years. The initial crops planted were sugar beans, wheat, wheat seed and maize seed. The commercial farmer lent the farmers money to repair their farming implements, centre pivots and some of the boreholes. He helped them clear the land for planting and do soil sampling in preparation for cultivation. He also paid the farmers' outstanding debts with the Land Bank prior to cultivation and assisted them with their household needs without interest. After harvesting, he deducts the production costs from the gross income; takes 70% and gives the farmer 30% of the net income.

Box 2.1 Seed producer's perceptions

LPDA & LDLA are not satisfied with the contract content. They want equal share of profit. I am prepared to split the profit in half but then the farmers will have to incur the production costs and also pay for the technical service I offer them daily through my field technical advisor

Andre Hayde, commercial maize seed producer

Box 2.2 Partnership farmer's perceptions

Since being in the partnership, I have benefited a lot - besides having a stable high income, I gained crop management, financial, teamwork and other life skills. My livelihood has improved and I've managed to take my children to university.

Petrus Sekhu, Farmer, Rust de Winter

Farmers are currently producing only maize seed due to limited irrigation water allocated. The maize seed is a high value crop with higher income potential than normal edible grain. Maize and wheat crops have high water demands; farmers argue that the allocated water is still not enough for these crops, possibly due to high evaporation rates because of the low clay content of the soil.

There is another partnership, haymaking, whereby the commercial farmer provides implements, labour and other necessary inputs for making bales. After cutting the grass and baling it, he takes

70% of the bales and leaves the rest for the local farmer to either feed to his livestock or sell. On the other hand, the white farmer would buy the surplus bales from the farmer at R2 to R4 a bale, depending on the quality of the grass.

2.4. Crop management systems

For any development initiatives to be sustainable there are factors that need to be considered. These include: protecting the production potential and capacity of natural resources; preventing the degradation of water quality and biodiversity; reducing the production risk thereby providing security; ensuring economic viability; ensuring social acceptance and justice as well as maintaining and developing production and services thus, ensuring productivity (Hlatshwayo, 2005).

2.4.1. Labour

In 1981, white farmers in Rust de Winter used to employ up to 3000 farm workers from all over the country. Due to little cropping activity currently taking place, very few people are being employed on the farm. Commercial maize seed production offers the main source of employment for most people due to its high labour requirements. Other farmers employ caretakers to look after their livestock or crops on the farms. Some of these farmers are violating the Basic Conditions of Employment Act by over-working and under-paying their caretakers.

2.4.2. Farm management capabilities

Team work is needed to solve agricultural problems, and this is evident even on the Rust de Winter farm. Farmers in partnership are more capable of effective farm management and decision making. The daily guidance, technical advices, financial management skills that are offered through the partnership render the farmers more competent in their farming activities. Their improved livelihood and upgraded life skills offer them confidence and boost them in pursuing farming compared to other farmers. Although most of the decisions are not made jointly, the farmers admit that they benefit a great deal from the partnership. This will enable them to be self-sustained, self-reliant and competent when the contract term elapses.

3. METHODOLOGY

3.1. Agricultural Research for Development

Agricultural Research for Development (ARD), a multi-stakeholder approach to solving complex agricultural problems guided the team in its exploration of the opportunities for commercializing crop production on the Rust de Winter farms. ARD facilitated learning of the team members, using and learning from each other's experiences to enhance understanding of the problem outside one's field of expertise. The ARD approach is not always relevant for all problems, but is used to address specific problems that are complex in nature and as such cannot be solved through a single discipline. In such cases, cooperation by professionals of various backgrounds and disciplines leads to a better understanding of the problem, while at the same time sheds more light on other team members' and one's own discipline. Adoption of ARD helped the team to view the problem in its entirety, concerning themselves with all the factors contributing to the problem under study.

3.1.1. Justification for using ARD

ARD has redefined the role of research, to one in which the interests of all stakeholders are taken into account. The conventional form of research is one which is done to/on the rural poor, with results benefiting mostly the researchers. The knowledge acquired from the research is then for the benefit of the researchers and academia and produced in publication. ARD research on the other hand, through involving stakeholders throughout the research, ensures that results directly translate into concrete improvements in the situation that was studied.

ARD as a process for planning research and development activities that respond to the needs of the clients and beneficiaries

The emphasis is on creating links and synergies between activities of actors involved in rural development and knowledge systems. This implies that, the research agenda is negotiated and developed because those affected by a specific problematic phenomenon would have agreed that solutions are not easily available. Resultant understanding will not only be for the use of the researcher but will be directly benefiting all the stakeholders involved. The underpinning framework determines that the current situation be improved through the research.

ARD as a process of planning research and development activities that contribute to the wider and often conflicting development needs

This is based on the understanding that research is conducted in the context of the multiple development agenda, whereby it seeks to understand the various factors that could be caused by or causing the problem in question. Because everything is related to something else, it is important for the various aspects of development to be addressed by research and to be improved in such a way that they cause a ripple effect on many other aspects related to it. This is holistic thinking, where it is understood that the world is complex and reducing it to its simple parts robs us of the benefit of understanding it fully.

ARD as a process for planning research and development activities that use systems perspectives to integrate diverse perspectives

Agriculture is a man-made state of being, meaning that its very existence is brought about by the diverse nature of people involved in it. This symbolizes not only diversity but complexity. It is therefore fitting that solutions to agricultural problems will be found if, those involved are allowed to share their perspectives of envisaged improvement.

3.2. Methods used in this study

To conduct the field study, the team followed the ARD procedure, which has four phases (Fig 3.1). These include organization of an interdisciplinary team to deal with the problem at hand; problem clarification within the team members to get a common understanding of the problem; identification of development strategies with the stakeholders as well as formulation of implementation plans.

The whole process was divided into two phases, the preparatory phase and the actual field study.

3.2.1. The preparatory phase

This phase took place during the last week of the Knowledge Acquisition Phase, in Wageningen. The interdisciplinary team had already been organised, since the team members of the 2005 study were all from various institutions in South Africa with a task of implementing what they had learnt at Wageningen in their country. The team then reviewed the Terms of Reference as set out by the client (Limpopo Provincial Department of Agriculture), had a look at the available secondary data and developed a research & work plan depicting the purpose and expected outputs of the study as well as a timetable with research activities.

3.2.2. The field study phase

This took place in South Africa, whereby all the activities mentioned in the work plan were implemented. These activities are discussed below:

Reconnaissance survey
This is also called a windscreen survey, whereby the team spent a day with the Extension Officer (Mr Mmethi) going through the farms, to get a general idea of what was happening on the farms to prepare for fieldwork. The officer took the team around the farms and they managed to meet some resourceful farmers who were busy on the farms. The survey gave the team a general idea of how big the farm portions were; the condition of infrastructure and the distance from where the team would be based (for planning purposes). The survey also helped the team prepare well for their meeting with the Provincial Task Team.

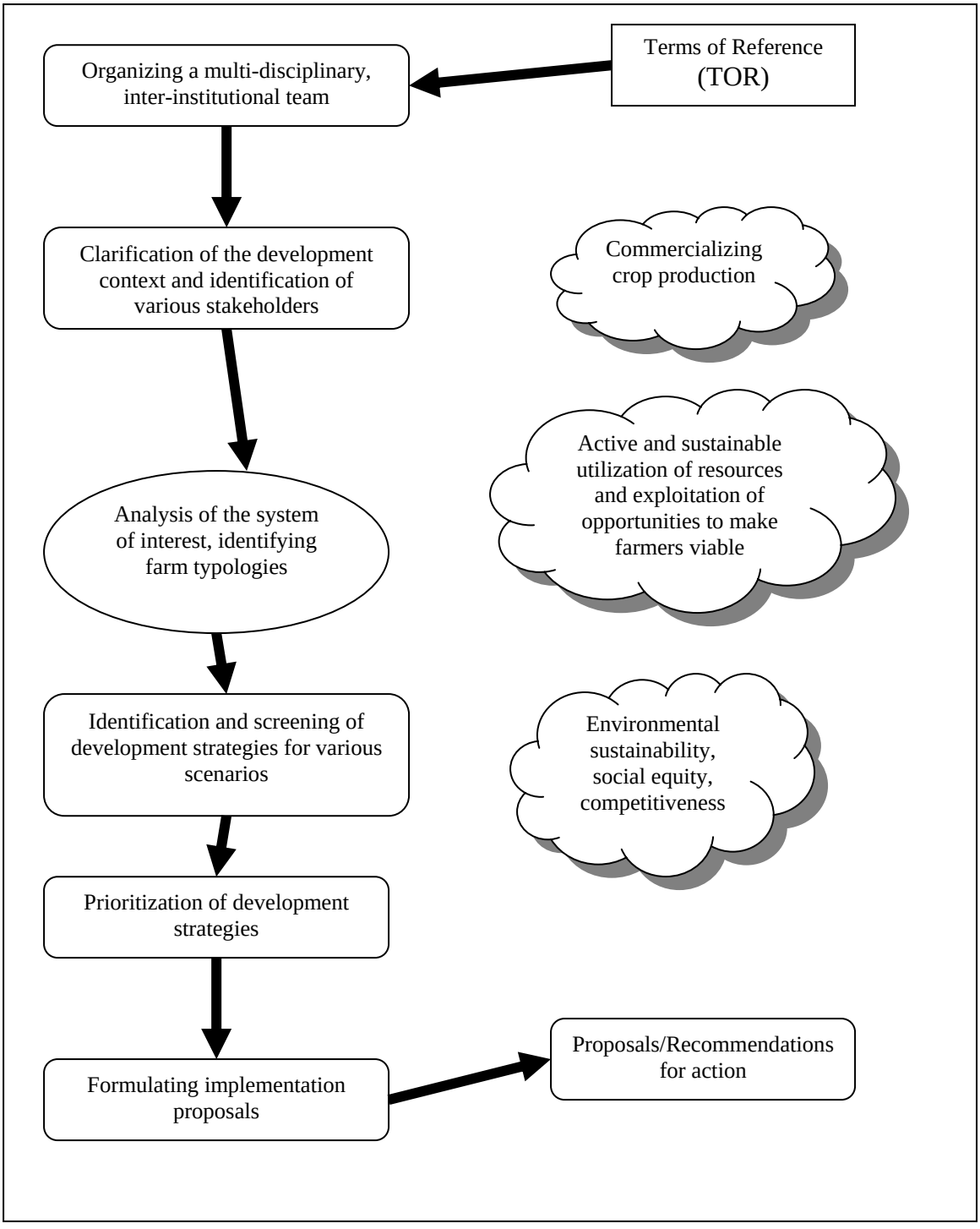

Fig 3.1: The ARD procedure

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Meeting with the Task Team

A week after arrival, the team met with the Task Team. The main aim of the meeting was for the ICRA team to verify their understanding of the Terms of Reference, so that both the team and the client would have a common understanding of what was expected of the team and from the study. The team had sat down beforehand and came up with a list of potential stakeholders that could be of relevance to the study. This list was then given to each of the members of the Task Team to go through, identify additional stakeholders and then choose the ten that the team could focus on. The results of this exercise are shown in Table 3.1

Table 3.1: Stakeholders as prioritized by the Provincial Task Team

Stakeholder	Priority
Rust de Winter farmers	1
Limpopo Department of Water Affairs and Forestry	2
Limpopo Department of Agriculture	3
Bela –Bela Local Municipality	4
Limpopo Department of Land Affairs	5
NTK	6
Land Bank	7
Existing partnerships	8
Agricultural Research Council	9
Supermarkets	10

Interviews with key informants

Key informants interviewed included: a retired TARS staff member (Mr Robinson); an Extension Officer (Mr Sithole) responsible for the Gauteng Province section of the Rust de Winter farms; a representative of the Bela-Bela Municipality Service Centre (Ms Mpe) and commercial farmers (Messrs de Villiers and Basson). These people were chosen due to their knowledge of the farms and their involvement with the farmers, to help the team enrich their understanding of the problem and come up with relevant recommendations.

Interviews with farmers in general

With the assistance of the Bela-Bela office, the team held a meeting with the farmers on the Limpopo section of the Rust de Winter farms. This meeting was held so that the team could introduce themselves; explain their reason for visiting Rust de Winter and the expected output of the study as well as their significance to the farmers' future. After these explanations were given, the farmers were split into three groups, to facilitate full participation of all farmers and to cater for language diversity among both the farmers and the team members. Within these groups, the teams used a list of guiding questions to gather information about general livelihoods at the Rust de Winter farms, the different farm typologies, a brief history of how the farms got to be on the farmers' possession, problems encountered in farming as well as possible solutions for the future.

Focus group discussions and interviews with selected farmers
These activities were undertaken with those farmers the team had identified as being active in farming, to get more in-depth information on farming in Rust de Winter farms and verify the information gathered at the first general meeting, especially the typologies

Interviews with other stakeholders
Interviews (personal and telephonically) were conducted with representatives of the following stakeholders from the Limpopo Province: Department of Agriculture; Department of Water Affairs and Forestry; Department of Land Affairs; Land Bank; Spar & Pick 'n Pay supermarkets; Noordelike Transvaal Kooperasie; Marble Hall Fresh Produce Market; commercial farmers.

Stakeholder analyses
Stakeholder analysis is a way of understanding a system through its stakeholders, by looking at their interests, objectives, power and relationships. It also helps in finding out conflicts among the stakeholders and possible ways of dealing with those. The team used the following matrices for stakeholder analysis:

Stakeholder identification matrix
The team listed all the potential stakeholders, based on the secondary data and the first meeting with the Task Team. These were then categorized into key or not key stakeholders, with reasons given for each choice.

Stakeholder influence and importance matrix
From the list of stakeholders, the team had to indicate the importance of each stakeholder group to the functioning of the Rust de Winter farm, as well as their influence.

Mid-term workshop
At this workshop the team presented progress made thus far and problems they encountered during data collection were discussed.

Workshop with stakeholders
For this workshop, the team was split into two groups, whereby one group worked with the farmers while the other group worked with the other stakeholders. The reason for the split was to cater for language (English) proficiency of the two groups of stakeholders. It was easier for the team members to discuss with the farmers in their local language, while with the other stakeholders' English was the proper language for discussion.

The workshop was for discussing farm typologies, driving forces, future scenarios and potential strategies with stakeholders - to either confirm that they were right or to come up with new/alternative ones. Ideas gathered at this workshop assisted the team in putting relevant information including the views/perceptions of all the concerned stakeholders to be incorporated into the report.

Final workshop

The aim of this workshop was for the team to present their findings to the client, all the stakeholders and key informants. From the findings the team had come up with recommendations for the future of Rust de Winter and these were discussed in detail with those attending the workshop. The outcomes of the workshop helped the team in finalizing their report for submission to the client.

4. SOCIO-ECONOMIC STATUS OF THE RUST DE WINTER FARMS

4.1. Livelihoods at the Rust de Winter farms

'Livelihood' refers to 'means of living' or 'the way people make a living'. Analyzing livelihood systems is the analysis of the way in which people make a living. In this case the study will focus on the analysis of how farmers in Rust de Winter make their living. The sustainability of the livelihoods in Rust de Winter is determined by various factors, as indicated in Figure 4.1.

In a broad context, the sustainability of livelihoods in Rust de Winter Farms is determined and driven through a number of elements/factors. Among these are: the **Activities** the farmers are involved in; access to, availability and control over **Resources**; **Dynamics** influencing and changing the functionality in the area; characteristics of the **People** (farmers) in the area; **Organizations** involved with the farmers and **Macro-influences** directly affecting the Rust de Winter livelihoods.

4.1.1. Activities

The economic and livelihood activities explained in this context are divided into on-farm and off-farm income. From the interviews with farmers, a representative picture was assembled, to explain the large dependency on off-farm income for the farmers in the area. The largest portion, 49% of the responding farmers actually got 100% of their income from formal employment, self-employment, social grants or remittances. Twenty-one percent of the responding farmers generated some of their income from farming activities, but relied on off-farm income sources for 50 to 75% of their income. Only 20% of respondents relied on off-farm income for less than 10% of their total household income. On average off-farm activities accounted for 64% of farm households' total income. Figure 4.2 shows the frequency of farmers with different levels of percentage off-farm income for their households.

Some farmers (15%) sublease their land for grazing and are themselves not engaged in any farming activities, though they have had the land in their possession for more than ten years. The most common agricultural practice is livestock farming, with 60% of the farmers solely engaged in livestock farming, whether at large-scale, small-scale, or simply for subsistence purposes. Seventeen percent of farmers are combining livestock with arable production. Even though Rust de Winter farm is said to comprise 13% of South Africa's best soils, only a small portion (< 8%) of the farmers is solely engaged in arable farming. The current farming activities in Rust de Winter farms are shown in Figure 4.3

Figure 4.1: A broad context analysis of the sustainability of livelihoods on the Rust de Winter Farms (Rich Picture)

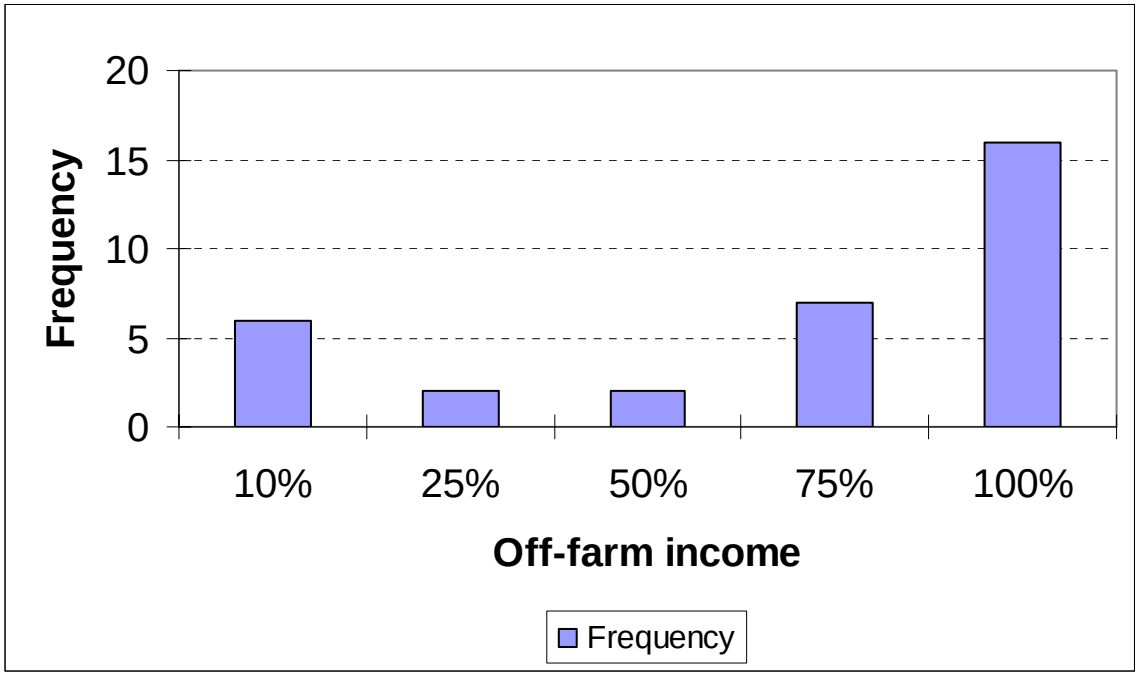

Figure 4.2: Percentage contribution of off-farm income to the total income of responding farmers

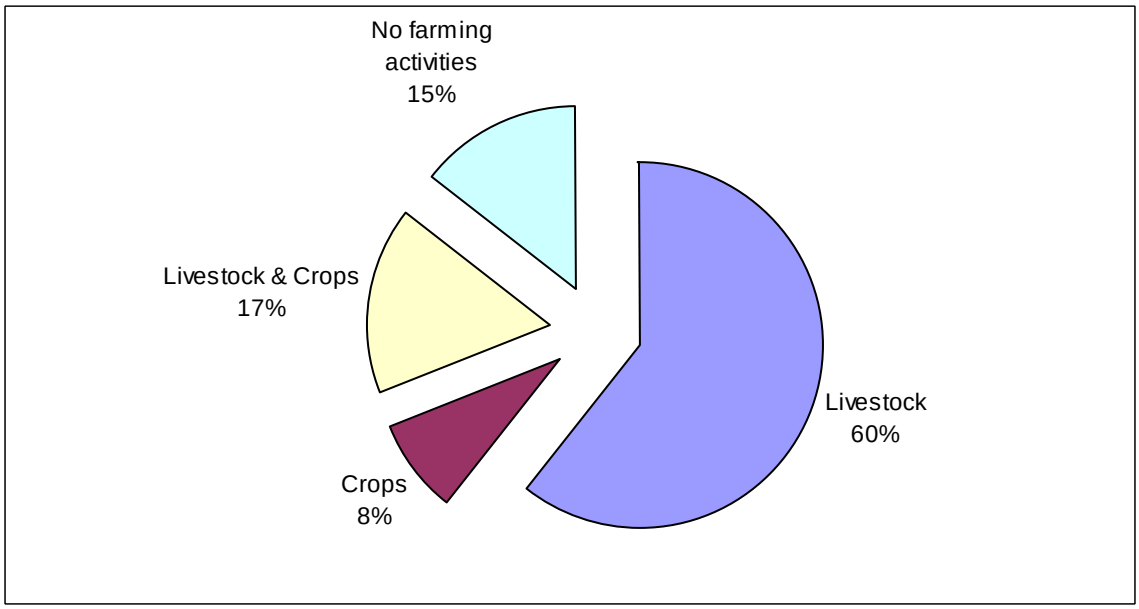

Figure 4.3: Percentage of respondents engaging in various farming activities as part of their livelihoods on the Rust de Winter Farms

4.1.2. Resources

Access to, availability of and control over resources have been indicated as the most important factors determining what farming practices the farmers are engaged in. The three important resources were; water, land and agricultural infrastructure. Water availability for irrigation purposes is determined by the quotas allocated to farmers, which are in turn influenced by the changing demand for industrial and household use. Land ownership and occupation of land have a great influence on farming activities.

4.1.3. Dynamics

The dynamics considered as influential to the livelihoods of the Rust de Winter farmers are: the historic developments that occurred in the area, the vulnerability of the community and the climatic changes experienced in the world.

As described earlier, the Rust de Winter area is rich in history of changing ownerships, political power play and tribal conflict; all influencing the agricultural practices. Land ownership was the backbone of historic changes in the area, but the allocation of water also played an important role in the historic developments. The availability and changes in control over the water had a great influence on the livelihoods of farmers in the Rust de Winter farms over the years.

The farming community of Rust de Winter is very vulnerable to external influences. The Land Bank in Modimolle also confirmed that 50% of the Rust de Winter farmers have good repayment ability on their loans, while the other 50% are still in debts. This vulnerability influences their food security, and general well-being of the households.

The two most common climatic changes in the world are the effects of global warming, and El Nino. Changes in rainfall patterns in South Africa have been visible in the agricultural sector. Late arrival of summer rains, decrease in general rainfall and more drought years have been experienced (AgriReview, 2005). These climatic changes heavily influence the livelihoods of the Rust de Winter farmers, especially those heavily relying on rainfall for grazing and dryland crop production.

4.1.4. People

The characteristics of the farmers have great influence on their livelihoods and incentive to be involved in certain activities. Three issues have been identified as main elements of the characteristics of the people: their level of knowledge and life skills, their culture, and their age.

The farmers acknowledged the fact that knowledge is a very important issue in determining their participation and success in different farming activities. The farmers involved in the partnership with the commercial farmer gain an immense level of knowledge. The knowledge is both on practical agricultural production, financial management, marketing and other life skills. Another source of training and knowledge transfer is through the extension services. Support is given through practical advice and through courses presented to the farmers. According to the farmers, these support services are not sufficient. The need for more effective training, in terms of quantity

and quality, was expressed during interviews. There is a direct relation between the level of knowledge and the effectiveness of farming operations.

Tribal conflict has divided the community of Rust de Winter and negatively affected the sustainability of people's livelihoods.

Another important characteristic of the people is the age of the farmers. The majority of the farmers are ageing, and some acknowledge the fact that they are now less capable in farming than they used to be in their youth. The level of farming activities is thereby influenced by the age of the farmers. The sustainability of the farm and the activities are also determined by the availability of a successor and the capabilities of and/or incentives for these successors.

4.1.5. Organizations

There is a Rust de Winter Coordination Forum, which helps the farmers deal with their water problems. Currently this is the only thing the forum can do, due to the outstanding land ownership issue.

The partnership with commercial farmers has been identified as another level of organization, due to the great effect it has on the livelihoods of part of the community. The known partnerships are maize seed production and haymaking. In both partnerships the involved Rust de Winter farmers are benefiting with a significant positive effect on their livelihoods.

4.1.6. Macro-influences

The macro influences on the Rust de Winter farms can be explained in a very broad context, but the narrowed down macro-influences can be explained through markets, policies, institution and research, due to their direct effect on the livelihoods of the farmers in Rust de Winter.

Market outlets were proven to be the most important aspect to consider when producing commercially. The availability of markets determines the activities of the farmers.

Another major influence on the market possibilities for the Rust de Winter farmers is the level of competition. The local competition is not very fierce, because few farmers produce for the market. The greater challenge is the high level of competition to be faced from other commercial farmers in the surrounding areas and across the country, delivering to the same market.

Box 4.3: Market contracts
Because of price and demand fluctuations, farmers cannot just provide for the open market anymore, they need to have commitment from specified market contracts.
Andre Hayde, maize seed producer

Policies have a significant influence on the Rust de Winter farmers, especially because the farms are still state land. The current land claims that are still unresolved have a significant effect on the farming operations and the future of the farmers' on-farm livelihoods. Another policy influencing the farmers' livelihoods is the acquisition of water rights. Water allocations, cost of water, and availability of water to the farms are the determining factors in agricultural practices.

4.2. Analysis of crop and livestock at the Rust de Winter farms

4.2.1. Farming at Rust de Winter

Most of the farmers practice livestock farming with the rest practising either mixed farming or crop farming. The livestock farmers have a large number of cattle and a few sheep, goats, pigs and chickens. The cattle and pigs are sold to neighbouring villages or to other farmers while the goats, sheep and chickens are mainly kept for household consumption. The crop farmers grow maize (seed and grain), sunflower, wheat and to a limited extent vegetables. Due to limited amount of water for irrigation, crop cultivation is practiced under both irrigation and dryland conditions. For this reason, farmers usually get marginal yields of poor quality. Some farmers who are documented as crop farmers have no agricultural activities on their farms and are subleasing their portions for livestock grazing.

The Rust de Winter farm consists of a total of 38 000 ha, of which 26 000 ha is located in Gauteng and 12 000 ha in Limpopo Province. The plots vary in sizes, as shown in Figure 4.4.

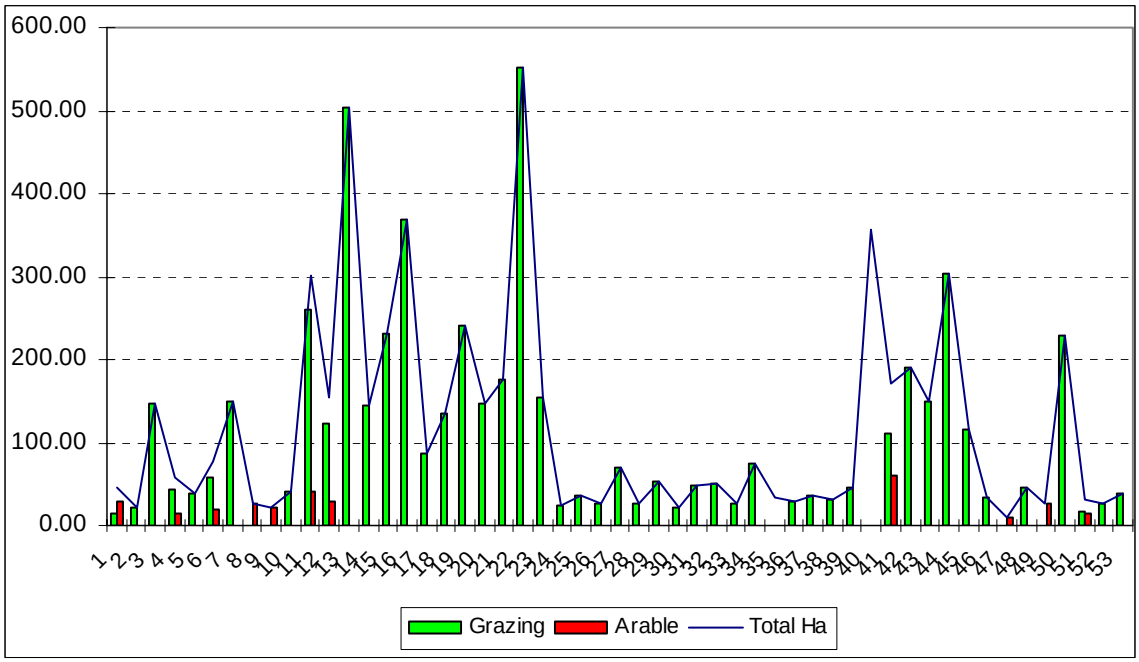

Figure 4.4: Total size of land (ha) of the Rust de Winter farmers in Limpopo and the distribution to livestock and crop production

Source: Gauteng Provincial Department of Agriculture, 2005

It is clear from the figure that, cattle farming is currently the most important farming activity in the area, with only few and/or small percentages of farms being allocated to crop production.

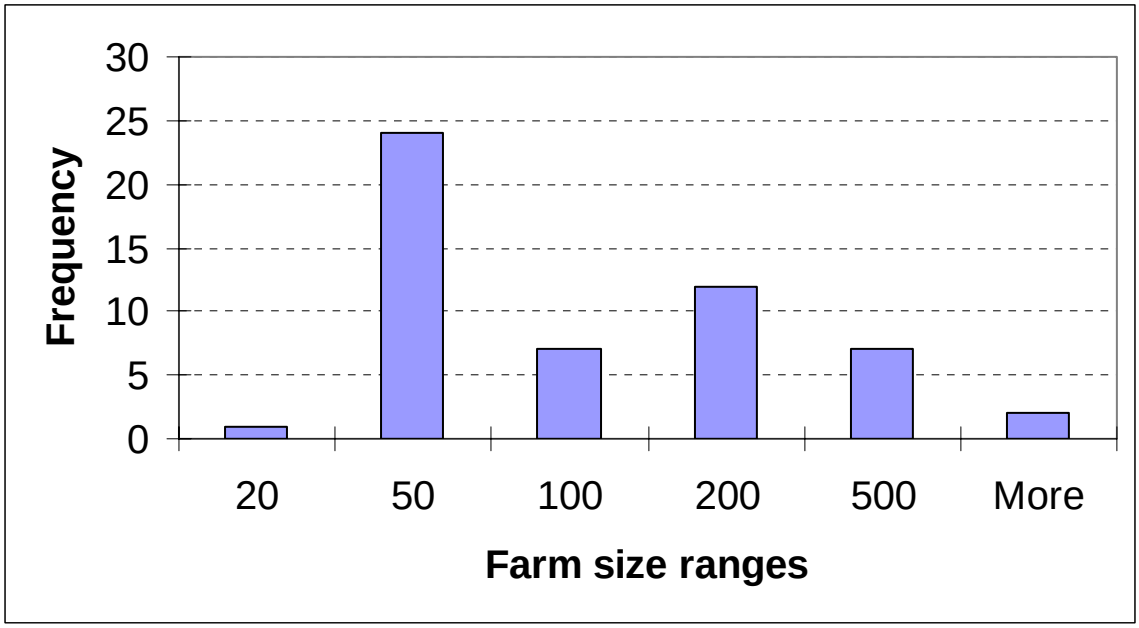

Figure 4.5: The number of farms in the Rust de Winter farms in Limpopo in and between these ranges of farm sizes

Source: Gauteng Provincial Department of Agriculture, 2005

Figure 4.5 shows that most (24) farmers have a farm size of between 20 and 50 ha. The second largest group is twelve farmers with farm sizes between 100 and 200ha. Only 1 farmer has a plot of only 20ha. Seven farmers have plots sized between 50 and 100ha and another 7 farmers with plots between 200 and 500ha. Two farmers have plots larger than 500.

4.2.2. Importance of crop production

Key informants interviewed suggested that Rust de Winter farms contain some of South Africa's best soils. For this reason, efforts have been made to commercialize agriculture in the area, particularly crop production. Out of 67 people interviewed, 85% are involved in farming. Cropping accounted for 25% and livestock was 60%, thus proving farming to be important to Rust de Winter. If one goes by these figures, it is worrying that currently, crop production is only being practiced by a marginal few. Vegetable production is also being practiced for subsistence purposes. The farmers categorized as competitive are in a partnership with a white commercial farmer producing maize seed, a high value crop. Other crops grown are sunflower, maize and cucurbits. Discussions with key informants revealed that any crop can successfully be grown as soils are good. The major limitation is water availability - rainfall is limited, rendering dryland crop production risky.

4.2.3. Importance of livestock production

As indicated previously, livestock is the major farming activity at Rust de Winter farm, as indicated by 60% of farmers interviewed. Farmers interviewed attested to being poor and only receiving meagre income, e.g. remittances and pension. Most farmers only sell stock in times of financial strain.

4.3. Farm Typology

4.3.1. Background

Focus of this study was on different agricultural zones and stakeholders, meaning exploration of agriculture as practiced at Rust de Winter and the various stakeholders interested or affected by it. The relationships between the stakeholders were explored to understand why farmers in the area were not commercially viable. Part of gathering this understanding is unpacking how productive activities in Rust de Winter fit with national and provincial markets and the forms of organization at community and regional level. It is perceived that the structures will have a bearing on the success or failure of these farmers to penetrate and develop their position in these markets.

4.3.2. Definition of Farm Typology

Rust de Winter is no different from other rural areas; its households are heterogeneous. Rural households differ in the availability they have over natural, physical, human, social and financial capital; in other words the assets required to engage in farming. It is well understood that since there is only one area in question, the variability in some of these assets will not be great. Natural capital, which covers soil and climate for example, will be the same for all the farm households as they are geographically located in the same zone. Therefore, the natural capital can be categorized as being a zonal factor rather than a typological one. A typology entails variation of assets in the households under the same area. In a typology, households differ in their: access to resources, preferences, objectives, and expectations and hence their engagement in different activities, both agricultural and non-agricultural. To identify a typology for the Rust de Winter farms, multivariate analysis was conducted. Multivariate analysis was chosen as it utilizes two or more criteria to categorize production systems. A three-pronged criterion was considered: farm size, sources of income and aspirations about farming.

There are four types of farming activities identified for the purpose of the study:

- Crop farming under irrigation (vegetables and field crops)
- Crop farming under dryland conditions,
- Livestock farming and;
- Mixed farming

4.3.3. Use of farm typology to identify development strategies

Different types of farmers will need to adopt different but mutually concerted strategies to bring about desired change. A typology of the stakeholders, more specifically farmers, is affected differently by the problem and as such requires different strategies to address the problem, under

the different future scenarios. The aim is to identify and agree on a concerted set of strategies by the various stakeholders that solve the problem, while having a desirable effect, or at least avoiding negative effects. An example of the use of typology in Rust de Winter is such that arable production under irrigation will require a strategy that improves availability of water for irrigation. Farmers producing under dryland conditions will need to look closely at adoption of drought tolerant crops and to plan their cultural practices more efficiently to ensure they make the best use of the rainfall pattern. In the same token, livestock farmers would need a strategy that could help them improve resource usage and stock improvement. Farmers practicing mixed farming are most likely to favour a strategy promoting best integration of the two enterprises, e.g. use of animal manure for fertilizing crop fields.

5. OPPORTUNITIES FOR COMMERCIAL CROP PRODUCTION

5.1. Introduction

There are various opportunities for farmers to become commercial crop producers. This would include improving crop management skills, financial management, and marketing skills. Farmers need to develop strategies to manage risks, which could include mixed farming, partnerships and crop insurances. In order to cope with fluctuating prices, farmers need to adapt to changes in supply and demand conditions. To satisfy the markets, farmers need to get used to quality control systems, get access to timely market information and be able to produce quality products for the market. This chapter covers production levels and risk aversion, and present marketing practices such as marketing channels, supply and demand and consumer preferences.

5.2. Production levels and risk aversion

The estimated total volume of agricultural production for 2003/2004 is 3% lower than it was in 2002/2003. The volume of field crops produced decreased by 11%, due to a decline in the production of grains, oilseeds and sugar cane. Horticultural production decreased by 2%, mainly as a result of a decrease in vegetable and subtropical fruit production, while animal production increased by 2% (AgriReview, 2005).

As mentioned earlier, the vegetable project initiated by the Gauteng Provincial Department of Agriculture (GPDA) and ARC failed, due to many reasons including the following:

- Late planting
- Lower production levels than the required market quota for the Pretoria Fresh Produce market

Maize seed production is good for those farmers in partnership with the white commercial farmer. They have a five-year contract producing maize seed under irrigation for Pioneer Hybrid International. These farmers have access to good and timely market information as well as crop management principles. Their crops are insured against fire and climatic damage such as flood and droughts. The farmers are diversifying into livestock production as a risk management strategy. The cattle are bought through assistance of the partnership.

There are also farmers producing sunflower, maize, and melons under dryland conditions. These farmers are doing very well even though production fluctuates as a result of erratic and unreliable rainfall. They keep livestock to minimise the risk of depending solely on their dryland crop production. The input cost is considerably lower for these farmers compared to those on irrigated lands.

5.3. Present marketing practices

In the past, farmers in the area used to sell their produce at Warmbaths cooperative, Settlers cooperative and farm gate stalls. There are farmers currently exploiting the Pioneer Hybrid International market in a partnership with a commercial farmer in the Rust de Winter area. The partnership produces maize seed on contract for the market, and cannot produce for an open

market due to price and demand fluctuations. The partnership makes efficient use of resources, share assets (costs and benefits) and provides access to information on recent farming technology.

Farmers are complaining that the farm gate price they receive and the retail price the consumer pays differ (AgriReview, 2005). In the past, the marketing margin was minimized through government intervention, which took care, that the produce would reach the consumer quickly. According to them, deregulation and trade liberalization will benefit neither farmers nor consumers. They blame the middlemen for taking too much advantage out of the sweat of the farmers even to the disadvantage of consumers. Farmers receive less and consumers pay more (ICRA, 2003).

5.3.1. Marketing channels

There exist a number of marketing possibilities for farmers in the Rust de Winter farms.
Spar supermarket (Bela-Bela) and fresh produce market (Marble-hall) are willing to buy high value commodities from the farmers if the quality meets the required standards. Their current suppliers are: farmers from Settlers, the Pretoria Fresh Produce Market and the supermarket's distribution centre. These markets require high value commodities such as pumpkin, potatoes, tomatoes, green pepper, cabbage, watermelon, beans, sweet potatoes and green beans.
Quality, correct packaging and continuous supply are vital for supplying these markets (Mashela and Mathabe, 2002).

Box 5.1: Buying from small-scale farmers
We will buy products from the small-scale farmers if the quality is right and the price is market related. We'll support the community because they support us
Trui Geldenhuys, Manager - Spar

5.3.2. Supply and demand

Agricultural commodity prices respond rapidly to actual and anticipated changes in supply and demand conditions. Most supermarkets have central distribution units, which buy vegetables from farmers on contract. Pick `n Pay already buys 15% of their fresh products from local farmers. The price elasticity of supply of an agricultural commodity reflects the speed with which new supplies become available (or supply declines) in response to a price rise (fall) in a particular market (AgriReview, 2005). Prices will be low when supply is high (in season production) and price will be high when supply is low (out of season production) (Mashela and Mathabe, 2002). The advantages of selling to a retail outlet for the farmers are that the prices offered are slightly better than at the fresh produce market and there is no sales commission. The disadvantages of delivering to fresh produce markets are:

- High transport costs
- Sales commission to agents
- Price is determined by demand and supply
- Markets are for large volume production

5.3.3. Consumer preferences

There is a demand for high value vegetable commodities in Hammanskraal Township and the taxi rank. These customers buy their household food products from hawkers who currently acquire their commodities from the Pretoria Fresh Produce Market and Marble-Hall Fresh Produce Market. Both markets are far away so that customers pay more for the products as a result of the high transport cost. Due to increasing consumer demand Spar (Bela-Bela) is planning to expand their fruit and vegetable section to sell bunches of carrots, beetroot, and spinach. This will provide an opportunity for small-scale farmers to supply their products.

6. ANALYSES OF THE STAKEHOLDERS

6.1. Introduction

The stakeholder analyses involve the identification of the relevant stakeholders, considering their objectives towards the research problem, and then obtaining their perspectives on the problem situation and possible solutions towards commercial crop production on the Rust de Winter farms. In this chapter, various stakeholder matrices will be constructed to compare the information available about the different stakeholders.

Stakeholders are those individuals, institutions or organizations that have interest or influence in the problem situation. The problem of identifying opportunities to commercialize arable production on Rust de Winter farms is faced by all these stakeholders. There are many examples of lack of communication, power play, and lack of appropriate decision making by various stakeholders.

6.2. Key stakeholders and their objectives

The objectives, roles and influence of each stakeholder to the problem were considered. Some stakeholders have conflicting objectives while others have shared objectives. The clustering of stakeholders, according to conflicting and shared objectives can provide justification on their perception on the problem situation and the possible solutions. The clustered stakeholders are shown in Table 6.1.

Table 6.1: Stakeholder cluster objective analysis

Stakeholder Clusters	Conflicting objectives	Shared objectives
NTK, SPAR, Pick 'n Pay, Marble Hall Fresh Produce market	Market outlet Field crops vs Vegetables NTK is also a input suppliers	Market outlets
Land bank, Partnership (Production), Limpopo Department of Agriculture, Department of Land affairs, Gauteng Department of Agriculture.	-	Provide financial support for Agricultural development
Farmer, Partnership (Production), Partnership (Hay making)	-	Utilization of available resources and commercial production
Department of Land Affairs, Department of Water Affairs and Forestry.	Control over water vs land	Resource management and administration
Limpopo Department of Agriculture, Gauteng Department of Agriculture, Agricultural Research Council, Bela-Bela Municipality	Competing on service provision Administration and research and development vs only research and development	Agricultural and local economic development

6.3. Shared perceptions on the problem and possible solutions

The stakeholder perception matrix gives a clear indication of the various stakeholders' perceptions on the problem situation in Rust de Winter farms and the possible solutions to creating opportunities for commercial arable production. Table 6.2 indicates the shared perceptions on the problem situation and the shared perceptions on the possible solutions. There are many stakeholders, who shared specific perceptions on possible solutions, while having different perceptions on the problem situation. There are two cases with problem situations and the possible solution being directly contradictory to each other. This is indicated in dark and light grey, respectively.

Table 6.2 Stakeholder perception matrix

Clusters of stakeholder	Shared perception on problem situation	Shared perceptions on possible solutions
LPDA, DLA, DWAF, Partnerships: Production, Partnerships: Resource utilization, Irrigating farmers, Dry land farmers, Mixed farmers, Subsistence farmers	Limited access to water	Improved access to water for the farmers
DWAF, DLA, GPDA	Shortage of water in the dam	
DLA, partnership: Resource utilization	Lack of clarity on water allocation	
DWAF, Partnership: Production, Partnership: Production	Power play between government departments – No decision making on water allocation	
Partnership: Production, Partnership: Resource utilization, RESIS, Irrigating farmers, Commercial farmers	Land claims (No land ownership, No water rights)	
LPDA, DLA, Partnership: Resource utilization, Land Bank, Dry land farmers, Commercial farmers	Damaged infrastructure	
NTK, Dry land farmers, Subsistence farmers	*Erratic rainfall patterns and climatic changes makes dry land production unfeasible*	
DLA, RESIS, Commercial farmers	*Unusable groundwater / boreholes*	
Partnership: Resource utilization,		*Dry land production is possible*
Partnership: Resource utilization, Partnership: Production,		*Boreholes are feasible source of water*
DWAF, MHFP, Partnership: Resource utilization, Supermarkets, RESIS	Wrong crop production	Provision of training / support / long term guidance
NTK, DLA, Dry land farmers, Mixed farmers, Subsistence farmers, Commercial farmers	Lack of financing	
DWAF, Partnership: Resource utilization, Partnership: Production, Land Bank, Dry land farmers, Mixed farmers, Commercial farmers	Lack of technical and management skills	
LPDA, Partnership: Resource utilization, Partnership: Production, NTK	No incentive to farm and under-utilization of resources	
DLA, DWAF, Partnership: Resource utilization, Partnership: Production, Supermarkets, MHFP, RESIS, Irrigating farmers, NTK, Commercial farmers		Produce for committed and specific markets (e.g. Vegetables, large quantity, high-value, high quality)
LPDA, DLA, RESIS, Dry land farmers, Mixed farmers		Provision of infrastructure
DWAF, Partnership: Resource utilization, Partnership: Production, MHFP, Supermarkets, Irrigating farmers, Dry land farmers, Commercial farmers		Partnerships and collaborations
LPDA, DLA, DWAF, NTK, Land Bank, Dry land farmers, Mixed farmers, Subsistence farmers		Improved effective extension services

6.4. Stakeholder linkages

The importance of the stakeholder linkages matrix is emphasized through the identified power play and lack of influential decision making towards policy and regulations on the Rust de Winter farms. The matrix can help to develop insights in the linkages between stakeholders that are providing and using agricultural services: i.e. resource allocation, extension and knowledge transfer. The matrix was used to evaluate the strength and relevance of linkages between stakeholders, and it served as a guide for improving relationships as well as negotiating preferred linkages. It is necessary to improve relationships among various stakeholders like those in service provision as well as resource allocation and services users. The criteria developed for assessing linkages are:

- Frequency of contact
- Formal / informal contact
- One way / two way contact
- Awareness of each others' functions
- Relevance of other stakeholders' services
- Timeliness of service provision
- Accessibility of services
- Appropriateness of communication media used
- Control over linkages

The stakeholder linkages are summarized in Table 6.4, where the first three columns provide the perspectives of LPDA, DLA and GPDA on the linkages amongst them. These perceptions were gained during a workshop, and the relevant stakeholders' shared the opinion they had of each other. Their perspectives about the linkages between them and DWAF and commercial farmers are also listed. Unfortunately, DWAF's and the commercial farmers' perceptions could not be captured, because they were not present at the workshop. Sometimes the service providers and the farmers had conflicting perspectives about the current linkages.

Table 6.3: Stakeholder linkages analyses

Stakeholders	LPDA – extension services	GPDA – extension services	DLA	Rust de Winter farmers
LPDA – extension services				(weak) Seldom, one way contact, which is relevant, but lacks timeliness
GPDA – extension services	(+) Good, frequent contact, which is informal and two-way.			(moderate) Contact available and accessible on request only
DLA	(moderate) Often contact, which involves land tenure. Transparent, close linkage	(weak) Only in contact during renewal of leases, or changes in land tenure		(weak) Very seldom contact. Very relevant services, but is very inaccessible
Rust de Winter farmers	(+) Frequent, two-way contact	(+) Constant contact and permanent presence. There is both one-way (farmers' days) and two-way contact.	(weak) Only contact when distributing land	
DWAF	(weak) Only contact if problem occur. Linkages is not transparent	(weak) Only in contact during changes in water allocations or other problems	(weak) Seldom in contact – only with changes in policy of land tenure and water allocation	(-) Very seldom contact, which is very formal and inaccessible.
Commercial partner farmers	(-) No contact	(-) No contact	(-) No contact	(+) Often, two-way contact, which are very relevant and completely accessible.
ARC	Unknown	(+) Frequent contact via existing research projects.	unknown	(moderate) Often, two-way contact, Provide relevant, but ill-timed services. Conflict between ARC projects

Note: (+) strong relation,
(moderate) moderate relationship
(weak) weak relationship
(-) negative relationship

6.5. Proposed improvements in the roles of different stakeholders

6.5.1. Stakeholder roles matrix

Stakeholders play specific roles in the livelihoods of the Rust de Winter farmers. The current roles, as shown in Table 6.4, were determined through interviews with the stakeholders and taking the farmers' observations and their experiences into account as well. The current roles are shown in normal print at the top or the cell. The roles should be changed or improved, when better and improved linkages between stakeholders will contribute towards effectiveness in the process of commercializing the Rust de Winter farmers. The proposed roles the stakeholder should play are shown in **bold** below the current role.

Table 6.4: Stakeholder role matrix

Stakeholders	**Roles**												
Present role / **Future role** 5 = 100% Effective 4 = 75% Effective 3 = 50%Effective 2 = 25% Effective 1 = 10% Effective - = No role	Policy formulation	Financial support	Research	Input supply	Marketing outlet	Knowledge transfer	Information provision	Resource allocation	Rehabilitate infrastructure	Farming monitoring	Long term guidance	Coordinating body	Farmers management
Limpopo Department of Agriculture	2 **4**	3 **4**	3 **5**			2 **5**	3 **5**	1 -	1 **4**	- **5**	1 **5**		4 **5**
Limpopo Department of Land Affairs	4 **5**	3 5					- **2**	4 **5**					
Limpopo Department of Water Affairs and Forestry	4 **5**						- **3**	4 **5**					
Partnership (Production)	-	4 **2**				4 **5**	3 -		5 **5**	5 **5**	5 **5**		4 -
Partnership (Hay making)		2 -			1 **3**	1 **3**	1 -						
NTK cooperative– Bela – Bela				4 **4**		- **3**	1 **3**						
NTK cooperative- Settlers				4 **4**	4 **4**	- **3**	1 **3**						
Land Bank – Modimolle		5 **5**					- **4**						
Commercial						1 **4**					- **4**		
Agricultural Research Council			- **5**			- **5**	- **5**						
Spar – Bela - Bela					2 **3**								
Pick 'n Pay – Bela - Bela					1 **3**								
Marble Hall Fresh Produce Market					- **2**								
Gauteng Department of Agriculture	3 **4**					3 -	4 -	1 -					4 -
RESIS			- **4**			- **4**	- **4**		- **5**				
Farmers									5			5	5

6.5.2. Importance / influence matrix

Stakeholders' current and proposed future roles can be used to determine their level of importance and influence within the whole system of farming in Rust de Winter. The differences in the stakeholders' current status' according to importance and influence in the system is shown in Figure 6.5. For the Rust de Winter farmers to become commercial arable farmers, the importance and influence of certain stakeholders, taking their roles into consideration, should change to ensure better service provision, linkages and functionality. The proposed level of importance and influence in the system are shown in yellow in the importance/influence matrix. The shifts to take place from current to future are indicated by arrows.

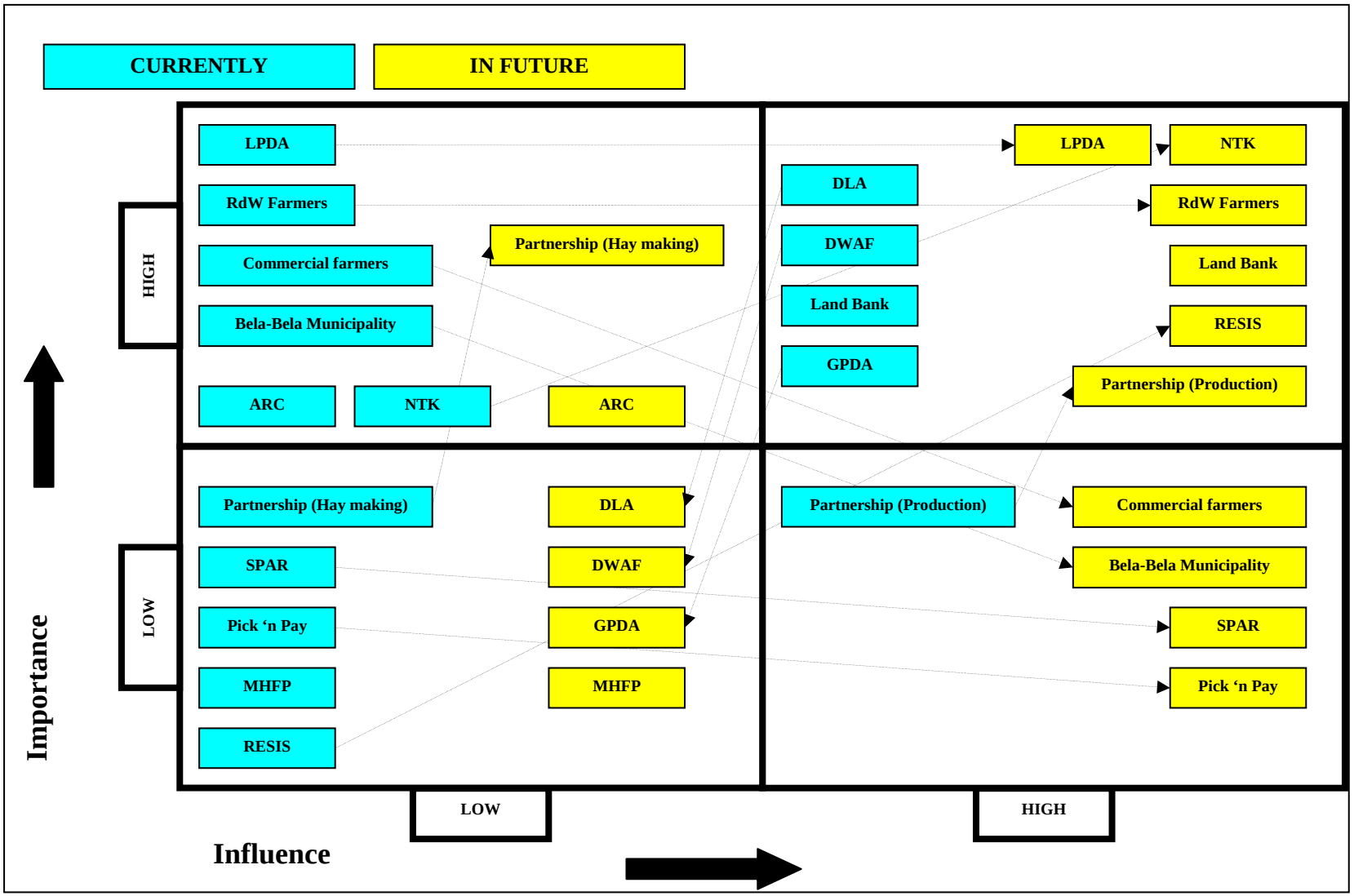

Figure 6.5: Importance / influence matrix for stakeholders involved in the Rust de Winter farms

7. DRIVING FORCES AND FUTURE SCENARIOS

7.1. Driving forces

Driving forces can be described as those factors causing changes in the livelihood, agricultural and political systems. These factors are often external to the system of interest, meaning that they are beyond the control of the local actors and stakeholders involved in the analysis. These factors further affect the problem situation and its possible solutions. Therefore, driving forces can be considered as part of the environment of the system of interest being studied, as the basis for developing research and development actions. They can include changes in social, technological, environmental, economic and political situation. Taking driving forces into consideration helps ensure that the factors likely to thwart efforts being made are properly addressed and included in the planning. It was found that there are many factors like that in Rust de Winter, hence the need to review them in detail, for proper analysis and planning.

7.1.1. National Water Act

Literature on Limpopo Province generally perceives water as the most crucial limiting resource, particularly for agriculture (Odhiambo, 2003; De Klerk, 2003). Although the Waterberg District contributes largely towards agriculture on the provincial level, acute water shortage limits optimization of the agricultural potential in some areas (De Klerk, 2003). It surfaced from interviews with various stakeholders that cattle and game farming are becoming a common practice in the Waterberg District. This was supported by arguments that these enterprises require less water than cropping. De Klerk (2003) further argues that the natural environment and human population suffer as a result of this rather serious shortage of water.

Salinity in irrigated areas is a major problem; with at least 26% of the soil in all provinces becoming either waterlogged or salt affected (Odhiambo, 2003). Salinity in Rust de Winter was particularly mentioned in relation to borehole water, rendering it unsuitable for irrigation. Most farmers said they prefer to use this water for cattle.

The Department of Water Affairs and Forestry (DWAF) has been mandated to manage and administer limited water in the province. The department uses the National Water Act 36 of 1998, as a vehicle for management, which includes allocation and control of water. Implementation of the policy implies the need to ensure fair allocation, in the face of limited resources. During discussions with DWAF officials the limitation of the Rust de Winter Dam was noted and the requirement of the Department to address the needs not only of the farm but also of the communities downstream in meeting their household water needs (as prioritized on the Act).

7.1.2. Land Policy

The South African current land ownership and land development patterns strongly reflect the political and economic conditions of the apartheid era. Previous racially based land policies were a cause of insecurity, landlessness and poverty amongst black people and also a cause of inefficient land administration and land use. The Land Policy deals with, amongst other things:

- The inequitable distribution of land ownership
- The need for rapid release of land for development
- The need for security of tenure for all
- The need for sustainable use of land

It is presented in the Land Policy document that, the aim of the South African government's land reform policy is four-fold:

- To redress the injustices of apartheid
- To foster national reconciliation and stability
- To underpin economic growth
- To improve household welfare and alleviate poverty

The four functions of the policy were extrapolated amongst a long list as they are very relevant for the situation in Rust de Winter. The Limpopo Department of Land Affairs (DLA) administers the land on behalf of the government (including the task of disposing of land), to ensure realization of the policy aim. The farmers at Rust de Winter occupied the land with the intention to farm, which is in line with the government's interest of promoting sustainable use of the land and realization of the policy aim to have land underpin economic growth. Against this background, farmers were then allowed to lease the land through collaborative efforts of the Departments of Land Affairs and Agriculture at a rate of R8.00 per annum as described earlier. This was facilitated through the government's Farmer Settlement Scheme.

Farmers' tenancy on the land is of an insecure nature, particularly as the land in question is being claimed by at least two tribes. It was learnt that the land claim in question has been heard at the Land Claims Court three times during the past three years. The future of the Rust de Winter farmers is at the mercy of the Department of Land Affairs through its policy. Report No 893/1/100 (2003), suggests that 'current land tenure arrangements and the concomitant insecurity are big problems for irrigation farmers at Rust de Winter' (FWR website, 2005)'.

7.1.3. Markets

Ability to secure markets is a key requirement for success in farming. These were the views of both the key informants and farmers. The problem of marketing in agriculture has been identified as the lack of organized markets for smallholder farmers. Currently only NTK, through its branches in the vicinity, is serving as a marketing outlet for Rust de Winter grain crops. Nesamvuni et al (2003), proposes that linking smallholder and emergent farmers with commercial markets can only be done effectively through cooperation with the commercial sector. Examples cited are joint ventures and partnerships, wherein government plays the mentoring role and provides support for production. The marketing outlets consulted during this study cited quality as a major deciding factor for procurement. These markets were interested in

vegetables, meaning that farmers looking to sell through these markets would need to have produce of high quality.

7.1.4. Non-Agricultural Employment

A considerable number of Rust de Winter farmers get 100% of their income from off-farm employment and non-farm related business. Secure non-farm employment renders farming unattractive and less of a priority. The farmers in question argue that as soon as they gain ownership of the land, they would farm on a full time basis. Unemployment has been the biggest challenge facing the South African government for the past ten years. A tendency to hold on to job opportunities offered has therefore been a common factor. Agriculture is therefore compromised with people having employment elsewhere who are only using the farm as an asset to be owned, but not to be made use of.

7.1.5. Partnerships

Partnerships with commercial farmers have brought about clear progress in the development of the resource poor farmers. As argued earlier, multiple benefits can be accrued by both parties to varying degrees. These partnerships have developed in response to changing trends and realization of mileage that could be made from pulling efforts and resources together. Benefits range from linking with markets, mentorship and skills transfer to financial assistance depending on the nature of the partnership.

Many of the current South African development ventures are conducted in partnerships. In most cases, these partnerships are dictated by the requirements of the funding agencies. The intention behind such a strategy is often good, although negative results have been realized in such cases. Such a situation would culminate as those involved would have come together on false intentions, i.e. by focusing on what is to be gained from engaging in the partnership instead of genuine interest for the people to be served.

7.1.6. Knowledge

Knowledge is listed as one of the crucial essentials for profitable farming. This includes technical, business as well as marketing of produce. Most key informants mentioned knowledge as the main factor for success in farming, suggesting that farmers with limited knowledge cannot perform competitively in farming. The degree to which farmers can have this knowledge depends on their access to extension. At the present, the unit responsible for provision of extension support (Bela-Bela Municipality Service Centre) is short staffed and admittedly cannot provide effective service. According to Nesamvuni et al (2003), public extension in Limpopo is not effective, and this can be attributed to weak public research systems, lack of expertise and limited resources. The training needs of farmers are virtually not documented and training of extension officers is given priority over training farmers.

Box 7.1: Knowledge of farming

Farmers do what they think is right, not what is right.

Makama J. Land Bank

7.1.7. Technology

Technology often goes with the geographical needs of an area. At Rust de Winter the white farmer settlement saw to the development of an irrigation scheme that centred on a sprinkle irrigation system, using centre pivots. This system is relatively sophisticated in nature and costly to operate. Although data is not provided to support erection of this technology, the FWR report 893/1/00 suggests that flood irrigation is not suitable for Rust de Winter, although their study had established that some farmers were still using it. Soil structure (sandy) does not have the water holding capacity required to use flood irrigation.

7.1.8. Natural resources

The upper and lower part of the farm is mostly bushy, rendering it currently either unsuitable for cropping or degraded. “Current’’ is to be considered an operative term, as this would imply that the situation can be reversed. Huge investments would need to be made to rehabilitate it. Some farmers neighbouring Rust de Winter have found ways to work with the situation by establishing relevant enterprises e.g. game farming.

7.1.9. Climatic Changes

Thomas (2003) submits that the rainfall pattern in Limpopo is erratic and that severe droughts are experienced at least every eight years. According to Nesamvuni et al (2003), the Limpopo Province is situated in a dry savannah sub-region, characterized by open grasslands with scattered trees and bushes. It is also characterized by very hot summers and mild winters, meaning that it is prone to drought, which is a common occurrence and hindrance to South African agriculture. AgriReview (2005) attests that South Africa as a whole received below-normal rainfall during the past few years.

7.1.10.Availability of finance and farmer indebtedness

Lack of access to finance and capital was cited by farmers as a major obstacle to profitable farming. Okorie (2003) suggests considerable lack of access to credits by smallholder and emerging farmers in the provinces. The author further explains this as being due to high rates charged by financial institutions, inadequate collateral, limited knowledge of financial institutions (and hence procedures) and profitable ventures and limited production and management skills (especially record keeping and financial management).

A problem cited as being symptomatic of this gap, is high farmer indebtedness. According to the Land Bank, 50% of farmers with loans with their institutions are badly indebted. The situation then renders such a farmer a risk factor, as he/she cannot progress in farming until their debt has been paid up. With a bad credit record, chances of securing funds elsewhere are minimal.

7.1.11.Diversification from agricultural farming

Secondary data suggests that tourism is the backbone of the Waterberg district economy. De Klerk (2003) argued that one of Limpopo Province’s main opportunities for economic growth lies in game farming and ecotourism. This view is confirmed by the incorporation of game farming and tourism by some commercial farmers into their enterprises as a way of spreading

risks. It was understood that game particularly presented an opportunity for 'tourists viewing and hunting'. One key informant supported this point as game provides job opportunities, but landowners should create their own opportunities, by providing facilities such as lodges.

The data further submit that 1240 game farms were recorded in 2001 with the provincial Environmental Division, with a further 899 in line for licensing in 2001. De Klerk (2003) presents this data to show that hunting does indeed constitute a major part of the tourism in the Waterberg district. There were two game and ecotourism ventures identified during this study within 10km of the Rust de Winter farm. One was privately owned and another one was mentioned during interviews as a business venture, entitled Dinokeng Game Reserve.

Box 7.2: Characteristics of a Commercial farmer

A successful farmer would identify trends and adjusts his farming accordingly; game has proven a viable option for the area, I do not see why RdW farmers can't make use of it.

Erasmus, DWAF

It was also learnt that the development of game farming in the area also can have negative implications for farming. A commercial dairy farmer had to sell his stock due to disease infestation from a game farm bordering his own, since the game were spreading 'snotsiekte' to the cattle.

7.2. Future scenarios

A future scenario is a future possible situation resulting from a combination of driving forces. It is also a vision of what the future might bring, and can be regarded as a hypothesis that can be validated through further research. Scenario planning is about exploring alternative pathways into the future. Different scenarios are possible, based on the nature and combination of driving forces, which might be positive or negative. One combination of the driving forces may result in a positive scenario where all driving forces are favourable for commercial production on the Rust de Winter farms.

Future scenarios provide a framework of possible ways of how the future might unfold. Different future scenarios are created, which includes the possibilities of different futures that could occur if conditions allow. The different prioritized scenarios developed for the Rust de Winter farmers are indicated below.

7.3. Impact of the future scenarios

Future scenarios are what is likely to happen in the future. They can affect the beneficiaries either positively, by agreeing with the beneficiaries' wishes or negatively, by going against the beneficiaries' wishes. The two versions of the impact of the scenarios are presented in Table 7.1 and then each scenario is discussed briefly.

Table 7.1: Impact of the future scenarios for Rust de Winter

Positive scenario	Negative scenario
Access to more water for irrigation	Access to less water for irrigation
Land ownership (Title deeds for farmers)	Loss of land (Land claim approved)
Increase in market demand	Decrease in market demand
Less off-farm employment opportunities	More off-farm employment opportunities
More reliable rainfall patterns	Less reliable rainfall patterns

7.3.1. Access to water

If the farmers would have access to more water for irrigation, they would be able to produce high value crops for the market. This would increase their farm income, profit margins and as such improve their livelihoods. Access to water would also make it easier for the farmers to get into partnerships with commercial farmers (seed producers) in the area.

If the farmers would not have access to water for irrigation, they would have to produce under dryland conditions, meaning they would have to produce mostly drought-resistant crops, such as sorghum and sunflower. This is the reason many farmers indicated as their shift from crop to livestock farming or not using the farm for agricultural production at all.

7.3.2. Land ownership

Currently most farmers are reluctant to make any investments for developing their farms, because they are scared of wasting their money on land they may have to vacate again if the claims on the land by the tribes will be honoured by the Department of Land Affairs. Then the farmers' leases will be terminated and they will be out of the farming business. However if the farm claim is not approved then farmers can obtain title deeds and develop their farming business further.

7.3.3. Market demand

Market demand is what determines where and how much of his produce a farmer will sell. Farmers should therefore produce what they can sell and not sell what they can produce. Farmers are willing to produce where the market exists. Meeting market demands is influenced by farmers having access to water, inputs, infrastructure (especially irrigation) and the technical know-how for the specific products they would be dealing with.

If there would be no market demand for the products that farmers can produce from the Rust de Winter farms, then those farmers who rely solely on farming for their livelihoods would struggle to make ends meet.

7.3.4. Off-farm employment opportunities

South Africa has a problem of a high unemployment rate and there is no hope that things may improve in the near future. People therefore, need to consider self-employment in farming as an option of making a living. If off-farm employment would present fewer opportunities for earning income for an individual's households, then more people would be interested in farming. More farmers would make farming their main activity and thus their major source of income.

If off-farm activities would present more opportunities for earning income for individual households, then less people would be interested in farming. This is currently happening at Rust de Winter – many farmers are having off-farm activities as their major source of income.

7.3.5. Rainfall patterns

If rainfall would be more reliable, then farmers would be able to produce under dryland conditions and even for those who are already irrigating, there would be less pressure to irrigate everyday. There would also be no reason to limit the water quotas that are allocated to the farmers by DWAF, because the dam would be full.

If the rainfall continues to be as unreliable as it is currently, yields will continue to decrease in Rust de Winter – more farmers will shift more and more to livestock farming, which does not need as much water as crop production.

8. DEVELOPMENT STRATEGIES

8.1. Identifying the strategies

The analysis of the system of interest focused on arable farming for different types of stakeholders affected by the problem. Stakeholders need different research and development options due to their varying capabilities, resource endowments, livelihood strategies, interests and vulnerabilities. The following farm types ask different actions from the stakeholders:

A- Arable farming under irrigation
B- Arable farming under dryland
C- Livestock farming
D- Mixed farming

Strategies are products of scenario building, which needs to be undertaken to result in a desirable future situation. A good strategy needs to be able to adapt to several possible future scenarios. The strategies are determined by what was learnt through engaging with stakeholders during the data gathering process. Strategies are developed to counteract the negative implications of the scenarios. It is important to show why a certain strategy is relevant for the achievement of the desired change.

Table 8.1 List of identified strategies and the suitable typologies

Strategies	**Suitable typology**
Rehabilitation of boreholes	A, B, C, D
Drought tolerant crops	B, D
Value adding	A, C, D
Partnership	A
Shift to game farming	A, B, C, D
High value crops	A
Crop diversification with livestock	A, B, C, D

8.2. Justification of strategies

8.2.1. Rehabilitation of boreholes

It is not clear whether or not more water will be made available for irrigation. The limited availability of water for arable cropping brought up the need for revitalization of boreholes on the Rust de Winter farms. The RESIS programme mandated by the LPDA is revitalizing 126 irrigation schemes in the province. The department also uses CASP (Comprehensive Agricultural Support Programme) for the development of infrastructure in other farming projects. When more water is made available, yields could be increased and arable farming might earn a profit.

8.2.2. Drought tolerant crops

Some farmers are practicing dryland cropping as a result of water shortage. Dryland cropping poses a challenge to farmers to use water optimally by using moisture conservation practices such as mulching, drought tolerant crops, etc. If water continues to be a limiting factor, farmers would be challenged to incorporate the cultivation of drought tolerant crops in their practices. These crops have the ability to withstand the dry climatic conditions and yet result in good yields. It is important for R&D to intervene and identify cultivars that are suitable for these climatic conditions and also to investigate what the market wants. Testing of growth and productivity patterns can be done with the farmers through research and demonstration trials.

8.2.3. High value crops

There is a need for efficient use of resources, taking into consideration the limited water for crop production. The cultivation of high value crops will ensure efficient use of water for the profitability of the enterprise. As such it is imperative for farmers to use the water profitably. High value crops like seed grains and vegetables have high profit margins compared to other crops. Cultivation of high value crops is labour intensive and would therefore create more employment opportunities, adding to the improvement of people's livelihoods. Farmers also need relevant facilities and a high level of skills to farm profitably with high value crops.

8.2.4. Value adding

To acquire competitive and higher prices, it is important to add value to the produce. A marketing strategy is to produce volumes with better quality. Vegetables can be washed and packed while grain crops can be treated and packed before selling to the market. The present grazing grounds are not sufficient for the livestock and as such it will be proper to invest in feedlots in order to add value and to make efficient use of resources. On the other hand, adding value ensures a guaranteed market.

8.2.5. Diversification to game farming

There is a growing trend in game farming in Waterberg District as it was mentioned that game and tourism are gaining momentum in the province. Market opportunities are still open for game farming. If rainfall continues to decline such that there can no longer be commercial arable farming, then farmers might collaborate in game farming. In this business, collaboration is needed especially for smallholder farmers since it requires high capital investment and more land.

8.2.6. Crop diversification with livestock farming

On many farms crop production is being replaced by livestock production. If water availability will continues to decline, diversification to livestock can serve as a risk aversion strategy in times of lower yields or unfavourable market prices for the produce. Practicing mixed farming also ensures efficient utilization of resources; because crop residues can be used as livestock feed while livestock manure can be used to improve the fertility status of the soil thus contributing to improved yields.

8.2.7. Partnership

Partnerships are being stressed in any government sector for its efficient use of resources and for complementing one another either in terms of human skills or physical resources.
Farmers have limited capabilities due to lack of resources, skills and knowledge, and limited decision-making capabilities, which puts them in a vulnerable situation. Farmers can form partnerships with commercial farmers in order to continue with their farming business and earn a better living. This will alleviate the heavy burden carried by farmers since production costs are shared and there is a stable income due to a secured or guaranteed market. Apart from the knowledge transfer, a commercial farmer offers management skills and other life skills required in business. Other partnerships can only be for sharing of resources with the aim of making extra income.

8.2.8. Capacity building

Farmers are not well informed about government policies that influence their existence on the farms. They also do not have the technical know-how of farming and farm management principles. Some lessees would like to be farm owners and not farmers. It is important to build the capacity among the farmers on acquiring policy information, crop management and use of correct practices, farm management, financial management and business skills. This will assist them to be self-sustained, self-reliant, competent and successful, regardless of what the future scenario holds.

8.3. Screening of strategies

The strategies are screened to verify their validity, feasibility and practicality. After the screening process, the strategies will be prioritized taking the selected criteria for screening into account.

8.3.1. Criteria for screening of strategies

Criteria were developed in terms of the **potential benefits** and **probable costs** of the proposed strategies. The criteria also involved the consideration of the necessary activities required to implement the strategies.

Potential benefits
The potential benefits could be measured in terms of the three different perspectives, which together can ensure sustainable feasible practices. The three perspectives that were considered in identifying the potential benefits are;

1. Economic implications (e.g. profitable commercial production)
2. Agro-ecological implications (e.g. sustainable resource utilization)
3. Sociological implications (e.g. improved livelihoods)

Probable costs

The strategies were screened according to the likely costs of the development. The criteria for identifying and comparing the probable costs are;

1. The necessary assistance required for implementing the strategy,
2. The probability of the development strategy to take place,
3. The time and duration of implementing the development strategy,
4. The costs involved in implementing the strategies, and
5. The probability of adoption of the development.

8.3.2. Results of screening strategies

Potential benefits

The potential benefits of the proposed strategies can be screened through identification of the economic, agro-ecological and social benefits/considerations. The listed screenings of the potential benefits are shown in Table 8.2.

Table 8.2: Screening the listed strategies through the economic, agro-ecological and sociological implications

Strategy	Economic implications	Agro-ecological implications	Sociological implications
Rehabilitation of boreholes	More agricultural economic activities through water availability	Utilization of ground water	Most farms have access to boreholes
Drought tolerant crops	Low input costs; available markets	Erratic rainfall	Serve the household needs.
Value-adding	High profit margins; Secure market outlets; High capital requirements	Most effective use of natural resources	Entrance to highly commercial market
Partnerships for production	Improved and secured markets	Utilization of water allocation Sharing of resources	Transparent planning; Business development required
Game farming	Extremely high capital investment required;	Minimum disturbance of natural resources	Require high level of marketing and management skills
Diversification with crop and livestock farming	Spreading the risk	Less water required than for arable production; Utilization of arable potential as well as grazing capacity	Cultural preference of agricultural practices
Partnership in utilizing extra resources for extra income	Extra on-farm income	Utilization of under-utilized resources; Resources should be controlled	All farmers can benefit
Production of high-value crops	High risk; high cost; high profit margin; Market based production	Utilization of water allocation	Improved livelihoods
Training	Increased economic opportunities to be explored through education	Better knowledge on utilization of resources	Improved knowledge and opportunities

When considering the benefits of implementing these strategies, the activities required for the implementation should be taken into account as well, before the potential costs are screened. The activities required are listed in Table 8.3.

Table 8.3: Farm typologies involved in and the activities required in implementing proposed strategies

Strategy	Activities required to implement strategies
Rehabilitation of boreholes	LPDA – identification of boreholes and facilitation of rehabilitation process
Drought tolerant crops	Feasibility study, trials, implementation
Value-adding	Determine markets, cost-benefit analysis and provide guidance
Partnerships for production	Identify relevant partners, Write clear and transparent contracts to ensure mutual benefit.
Game farming	Feasibility studies, assess possibilities
Diversification with crop and livestock farming	Re-allocation of unused land, implement grazing management system and ensure water availability
Partnership in utilizing extra resources for extra income	Identify resources that could generate extra income and create market opportunities
Production of high-value crops	Determine markets, ensure water availability, ensure training and long term guidance and effective management
Training	Ensure needs and requirements and identify relevant trainers and supervisors

Probable risks

The necessary assistance required for implementing the strategy

When considering the probable costs/risks of the proposed strategies, the necessary assistance required for their implementation is important. Both the farmers and the stakeholders had the opinion that assistance is necessary for the implementation of the strategies. Most of the strategies can be done by the farmer himself, but may require a certain level of extension services. The farmers, as well as the stakeholders, identified that the farmers need long term guidance to make a success of the activities. It was identified that game farming can only be done through collaboration between farmers

The probability of the development strategy to take place

The probability of the identified development strategy materializing was given three values:

1. Low
2. Moderate
3. High

Most strategies that were rated with a high a probability of occurrence by the farmers were rated with a moderate probability of occurrence by the other stakeholders, and vice versa. Only the strategies of producing high value crops and implementing training were rated high by both the farmers and the other stakeholders. An overview of the probability ranking of the development strategies is shown in Figure 8.1

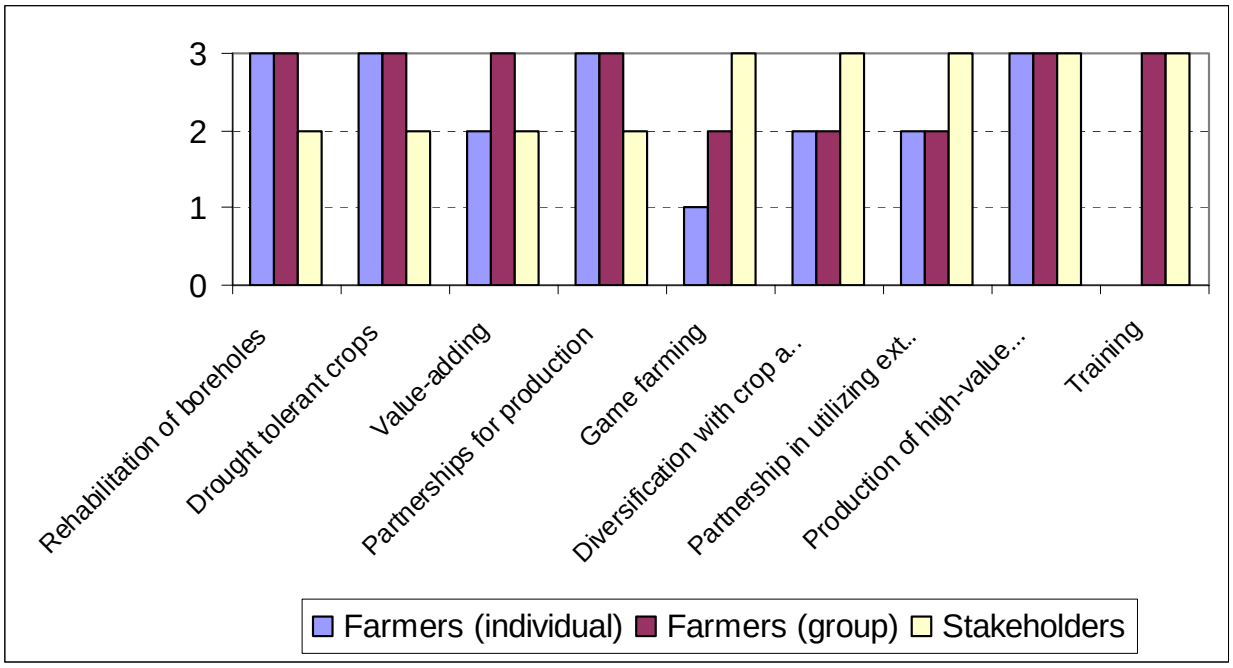

Figure 8.1: Probability of development strategies according to individual farmers, group of farmers and stakeholders

The time and duration of implementing the development strategy

The perception of the time/duration of implementing the strategies differed amongst farmers and between farmers and stakeholders. Their perceptions of the time/duration of implementing the strategies are shown in Table 8.4

Table 8.4: Time/duration of implementing the different strategies, according to the farmers and the stakeholders

	Farmers (individual)	Farmers (group)	Stakeholder
Rehabilitation of boreholes	Immediately	Immediately	5 years
Drought tolerant crops	1 Season	1 season	5 years
Value-adding	Immediately	1 season	1 year
Partnerships for production	1 Season	1 season	5 years
Game farming	5 years	1 year	5 years
Diversification with crop and livestock farming	1 Season	Immediately	5 years
Partnership in utilizing extra resources for extra income	1 Season	Immediately	5 years
Production of high-value crops	1 Season	Immediately	5 years
Training	Immediately	1 season	5 years

The costs involved in implementing the strategies

The very important aspect to consider when screening strategies is the proposed costs required to implement the specific strategies. It is important to screen the financial capabilities and possibilities of resource availability for farmers. The costs of implementing the development strategies were given three ratings:

1. Affordable
2. Moderate
3. Expensive

The stakeholders considered some of the proposed strategies to be more expensive than the farmers and the individual farmers assessed some strategies to be cheaper than the group of farmers. It was evident that the cost for game farming was rated as very expensive by all. The costs involved in implementing the strategies, as expected by the farmers and the stakeholders are shown in Figure 8.2.

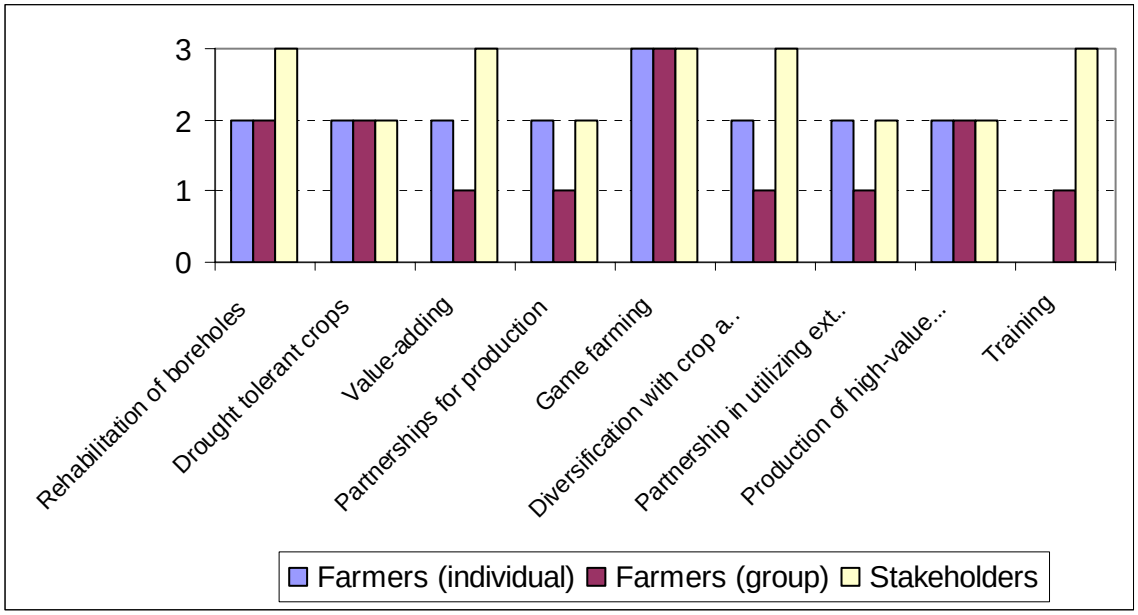

Fig 8.2: Cost of implementing the development strategies

The probability of adoption of the development

The probabilities of adopting most of the strategies were considered to be high. Not one of the strategies were completely new, or out of place for the existing farmers and the stakeholders involved, and none were considered to have a low probability of adoption.

8.4. Prioritization

After the screening process was done, all stakeholders prioritized the strategies. The following is the list of the prioritized strategies and the outlined reasons justifying the importance of the priority given.

8.4.1. List of prioritized strategies

All these prioritized strategies listed would be possible if both the land claim and access to water issues are solved on the Rust de Winter farm:

- Capacity building
- Rehabilitation of boreholes
- High value crops
- Value adding
- Drought tolerant crops
- Diversification of crop farming with livestock farming
- Partnership
- Shift to game farming

Capacity building
All the stakeholders and farmers acknowledged that limited knowledge and skills are significantly contributing to the limited crop production on the Rust de Winter farms. With technical advice and guidance; the extension officers, scientists and research institutions should engage in participatory research to respond to the needs of the farmers. Farmers must be trained on crop management skills, water use, management skills, team work and resource utilization skills. They also need financial management skills to obtain and effectively manage loans or other funds, to have access to information and knowledge of services the Land Bank and other financial institutions render. A monitoring system should also be set up to ensure that the money granted to farmers is relevantly and effectively used for agricultural purposes. In essence, capacity building should be done in conjunction with each strategy to facilitate implementation and to ensure results.

Rehabilitation of boreholes, High Value crops and Value adding
It was agreed that these strategies are interrelated; implying that implementation of one would lead to the implementation of the other. It was discussed that if water can be made available through revitalization of boreholes, farmers can fully engage in arable farming. This would mean that most farmers can produce high value crops with guidance from the extension services and other stakeholders. The farmers can also add value to their produce either individually or by collaborating, in order to increase their market share.

Drought tolerant crops
If the boreholes can not be revitalized, water would still be insufficient for commercial crop production. Therefore, it would be necessary for farmers to use drought tolerant crops. This would mean that Research and Development institutions such as ARC should assist in identifying suitable and high yielding crops and also help to evaluate the market before production commences.

Crop diversification with livestock farming

The farmers involved in identification and prioritization of strategies are mainly crop producers and their vision is to grow from being emerging and dependent into commercial and self-sustained crop producers. If all the above mentioned strategies will not bear fruits then farmers will diversify their arable farming activity with livestock production. This can also be a risk management strategy against unfavourable years where yields might be low or the crop prices are bad.

Partnership

The farmers emphasized that although the partnerships help them to revive their farming activities and directing them into commercial production, this should not be a long-term solution. They emphasized that they do not get financial support or any support from government to carry out their production activities, as such partnership is the only solution to earn a living and improve their knowledge base. In future they would like to be independent, financially sustainable and productive, like their commercial partners.

Shift from agricultural farming to game farming

The stakeholders suggested that this strategy be removed from the list since it will be economically unviable for the farmers on Rust de Winter farm. Viable game farming needs about 4500 hectares of land, which these farmers do not have. Also the capital needed to kick-start game farming is fairly high.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1. Conclusions

Changes required in crop choices and marketing for commercialization
Farmers need to adapt to high input prices by being more productive and being more efficient in their farming methods. The following views on requirements for commercializing crop production in the area were gathered during interviews with farmers, key-informants, representatives of market outlets and commercial farmers:

- Good planning of farming activities
- Produce for the market (produce what you can sell)
- Continuous supply to the market
- Satisfying level of quality
- Collaboration in transport for the market
- A need for a reliable market and production contract
- Optimum resource utilization
- Be knowledgeable on farming technology

9.2. Recommendations

9.2.1. Secure land tenure will ensure investment into the farm and improve access to credit

The pace at which land tenure is resolved at the Rust de Winter is cause for concern. All the stakeholders including the farmers agreed on this fact. Outstanding land claims on the farm needs to be resolved by relevant structure within DLA, so as to clarify land ownership. Awarding tenure rights to the farmers will improve the farm through rehabilitation of damaged infrastructure and building permanent structures, which the farmers are currently reluctant to do. Improved land tenure will help farmers to make long term planning, stimulate larger investments in their farms and to get much higher loans for crop production.

9.2.2. Improved access to water will provide better opportunities for commercializing crop production

It is clear that water availability for farming, particularly for crop production will remain a challenge for a long time, since most of the Rust de Winter Dam water is used for domestic and industrial needs downstream the Elands River. DWAF therefore needs to review its strategy for allocating irrigation water to these farmers. Priority must be given to those that are actually producing commercially who have a clear need for the water. This would require reallocation of quotas and improved communication lines. The farmers complained about a lack of transparency in the manner in which DWAF conducts its business, i.e. allocation of water and the criteria used.

Poor institutional arrangements have created desegregation and individualism in dealing with this issue. If farmers get organized and address issue collectively, this could have a positive effect.

The success of this approach is shown by the example of the six farmers working in a partnership with a commercial farmer. They have managed to access six times the amount of water of what was initially allocated. A water committee has been set up to negotiate for more water and deal with problems experienced.

Some of the key-informants were of the opinion that dryland farming is not feasible at Springboks Flats, the geographical area at which Rust de Winter is located. Research to determine the extent to which decreased rainfall has contributed to limited water availability for agriculture on the farm will need to be commissioned. The ARC - Institute for Soil, Climate and Water (ISCW) is ideally placed to undertake this research, possibly in collaboration with its sister institute the Vegetable & Ornamental Plants Institute (VOPI).

The AgriReview (2005) suggests that a better understanding of the potential impact of the current and projected climatic changes is critical if a farmer wants to stay ahead, so as to undertake steps to mitigate the effect of these changes. These steps could include: growing of drought tolerant crops, adapting one's planting program to the climate forecasting and to employ practices that improve the water holding capacity of the soil (such as improving the soil structure and organic matter content).

9.2.3. Capacity building and relevant support from stakeholders will enable productive crop production

Commercial production of livestock is an untapped opportunity at the Rust de Winter farms. For this to materialize, a structured animal production system would need to be put in place. The system could include animal health control, feedlots and effective grazing management. There is no animal health technician servicing the area at present. It would therefore be beneficial to allocate an animal health technician to the area who can help to improve knowledge and foster good stock management.

Knowledge transfer needs to be strengthened if the farmers are to compete successfully in the commercial farming sector. Development or improvement of their technical and business skills could put them at the same level of competition with other commercial farmers in the area. Tailor-made training programmes could be developed for specific types of farmers. The result of such programs is that the farm will become more productive and farmers in turn will be able to stand on their own.

Box 9.1: Importance of Agricultural skills
Better to teach a man to fish he will have the skill for life, than to give him a fish for a day.
W Basson, game farmer 2005

All the stakeholders interviewed unanimously agreed that there is a need for training, technical support and long-term guidance. This role could be squarely filled by the LPDA through its Research and Extension Directorate. BBMSC and TARS were consulted during this study and are ready to offer training. These stakeholders would therefore need to engage with each other and agree on aspects that could be offered by each respective unit. TARS could conduct demonstrations and trials to assess viability of crops proposed by this study as well as vegetables preferred by potential markets. Research could be done to develop appropriate technologies with farmers and thus ensure adoption. It should include a mentorship component and short term

courses. Agricultural Research for Development projects could also be an effective way of strengthening relationships between farmers and researchers, bringing in more research institutions such as the Agricultural Research Council. According to the ARD Field Study Series 4, collaborative research will contribute directly to an improved extension system, whereby research institutions would be linked with farmers as well as other organizations involved in agricultural development.

9.2.4. Reallocation of unused land to those with commitment to agriculture will contribute to more effective land use

The DLA and LPDA made land available for Rust de Winter farmers through lease agreements for sustainable farming, economic growth and food security. Some farmers are making realization of this aim impossible, by letting most of their leased land lie fallow. This might be caused by: lack of interest in farming, inadequate incentives, knowledge or resources. Serious consideration will have to be made in addressing the land issue, since some farmers are contravening the lease agreement. An investigation needs to be conducted to find the reasons that hinder productive farming so that adequate action can be taken and necessary resources and support can be provided.

Complaints about irregular and unfair allocation of land which resulted in inappropriate people obtaining land leases, needs to be dealt with. These complaints concern government officials who were granted farms without incentives for being productive. According to Department of Agriculture (2005) a civil servant, politician or any person holding a position within the government does not qualify to get a land grant. The DLA needs to investigate this matter further and dispossess officials prior to resolving the land tenure, to ensure that there is no system that disadvantages people with interest in farming.

9.2.5. Sourcing and securing markets

Markets such as restaurants, lodges, prisons, schools with hostels, presidential primary school projects still need to be explored. Information on quality control systems should be made available to farmers. Quality standards need to be set for other commodities at different stages of production and at provincial and national levels. Fixed contracts (volume, not price) could be agreed on. A continuous supply is important for staying in this market (Mashela and Mathabe, 2002).

The LPDA needs to help farmers with promotion and marketing of agricultural production. This implies identifying various marketing outlets for different agricultural products. This will help smallholder farmers to market their produce independently, by linking them with their buyers of their produce e.g. farmers in the Capricorn District have been assisted to market their crops to NTK and various markets e.g. Pietersburg Fresh Produce Markets (LPDA, 2004).

Individual farmers are sometimes unable to provide a continuous and reliable supply for the market. The solution is for farmers to be organized possibly through the assistance of a coordinating forum. This coordination structure could play a role in organizing farmers and strengthening their capacity to cooperate and talk in one voice. The operational structure at present is the Rust de Winter Farmers Union which assists with production matters. Should this

structure's leadership capacity be strengthened, their services could be extended to include marketing information. Benefits of having a market focus are: better income for farmers, pooling of resources, starting a savings scheme, social support, sharing of information, continuous supply for the market, sharing risks and economies of scale (ICRA, 2004).

9.2.6. Coordination among stakeholders

There is currently no coordination of service provision and collaboration between stakeholders involved in and working with the Rust de Winter farms. It is essential that this function is established, through developing a Coordinating Forum. This would ensure that there is clear delineation of duties, improved awareness of each other's function, no duplication of services and a more effective decision making process. The forum could also broadly coordinate support and monitoring of farmers. Another important function that such a structure could serve is providing support to the various stakeholders, i.e. review progress made and deal with constraints. The structure responsible for farm management at present, the Rust de Winter Farmers Union is neither clear of its mandate nor delivering accordingly to the farmers needs. Farmers therefore need to be assisted to improve unity amongst them so that they can act collectively. They realize that the problems they are facing with water in particular are too complex to solve individually. Their efforts to build unity through the forum were distracted by the division into the two provinces. They noted that they used to be a much stronger and unified team before the division of the Rust de Winter farms into Limpopo and Gauteng sections.

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APPENDICES

APPENDIX 1: TERMS OF REFERENCE:

LIMPOPO DEPARTMENT OF AGRICULTURE/AGRICULTURAL RESEARCH COUNCIL/ICRA FIELD STUDY IN WATERBERG DISTRICT, LIMPOPO, SOUTH AFRICA (APRIL TO MAY 2005)

RESEARCH TITLE:
LIVELIHOODS AND POSSIBILITIES FOR COMMERCIAL AGRICULTURAL PRODUCTION AT THE RUST DE WINTER IRRIGATION SCHEME

Institutional framework
Organizations in South Africa
The field study will be carried out as a joint study by the Limpopo Department of Agriculture's (LDA) Directorate of Research and Extension (DR&E), the International Centre for Research in development oriented Agriculture (ICRA), the Agricultural Research Council (ARC), the National Department of Water Affairs & Forestry (DWAF), together with Waterberg District Management (WDM), and its Bela-Bela Municipality Service Centre (BBMSC). Other institutions taking part are the Tompi Seleka College of Agriculture (TSCA), Madzivhandila College, and Towoomba Agricultural Research Station (TARS).

Main activities/ mandates:

DR&E: a directorate of the LDA responsible for Research and Extension
DWAF: responsible for the overall control of water allocation for use from dams, rivers and other sources.
WDM: an area bound directorate of the LDA responsible for the control and execution of Government Agricultural activities within the Waterberg District of the Limpopo Province.
TARS: research farm in southern Limpopo with a research function covering the Province. Main functions are natural resource management, crops and pastures. It is the closest LDA office to Rust de Winter.
BBMSC: responsible for services in the Greater Bela-Bela Municipality, situated on Towoomba. Rust de Winter is their responsibility.
ARC: represented by its Rural Livelihoods Division, which co-ordinate contacts with relevant Institutes:

- Vegetable and Ornamental Plants (VOPI) - on best practices for irrigated high value crops.
- Institute for Soil, Climate and Water (ISCW) - - on land use planning
- Summer Grain Institute - on best practices on grain crops.
- Protein and Oil seed Institute - on best practices on livestock.
- Grassland Institute - on best practices on fodder production.

Waterberg District: a geographic area in which the study is located. This is traditionally a commercial farming area, with pockets that have always been inhabited by the Tswana and Pedi people.
Rust de Winter: is an irrigation scheme developed for commercial farmers, bought out for settlement by black farmers. The water available for irrigation has been drastically reduced due to demands for household water down stream on the Elands River.
ICRA: ICRA is an international organization founded on the initiative of European CGIAR members. Its purpose is to "enhance human and institutional capacities in agricultural research for development (ARD) and rural innovation processes" through collective action learning rooted in real "field" situations and problems. It focuses on sharing, consolidating and where needed, generating new knowledge and developing new professional attitudes and skills for more effective ARD contributions to stakeholder innovation processes relevant to improving livelihoods of resource-poor farmers and broader needs of society.

Main interest of each of these stakeholders in the study topic:

DR&E: the directorate under which research falls, mainly through commitment to research and extension.
WDM: committed to agricultural development of formerly disadvantaged communities in Waterberg District.
DWAF: responsible for the sustainable use of water resources throughout the Republic of South Africa for agricultural, industrial and human use.
TARS: direct involvement in research in the Limpopo province in small stock, large stock, crop and pasture management research. Staff has some experience in irrigated crops.
Waterberg District: in this context must be viewed as the commercial farmers and rural communities and people residing in the district, some who are poor and require every opportunity for economic improvement.

Rust de Winter farmers: people who hire state land and are in line to purchase land on the LRAD part of the Rust de Winter irrigation scheme. There are approximately 80 farms involved. The area has a history of land invasion and some conflict. Most of the occupants of the land come from Ndebele settlements in the neighbouring Mpumalanga Province. This area is within the immediate service area of Towoomba Research Station. There have been numerous efforts to plan the area, involving various agencies including the Department of Water Affairs who determine irrigation water allocations.
ICRA: ICRA's professional training provides participating South African professionals in rural development with an opportunity to acquire new concepts and skills and to apply them in a professional assignment with SA partner research and development institutes. The core part of the ICRA program consists of a 6-week intensive field study as a professional service to partners in rural areas of South Africa. Scope and dimension of the SA field study are based on a Terms of Reference (TOR) jointly developed by the involved partners.

Period
The field study will be conducted from the 10th of April 2005 to the 21st of May 2005

Topic of the study
Livelihoods on the Rust de Winter Farms, Limpopo, SA: Opportunities for commercial agricultural production, in recognition of the limited irrigation potential.

Justification
The study will form part of the LDA's initiative to develop a stable agricultural environment for new farmers on the Rust de Winter irrigation scheme, to ensure that they are financially successful. There have already been a number of planning actions none of which has borne fruit. An ICRA study of the area will allow an independent overview of the situation which can be objective and that should provide a realistic assessment of the farming potential. At present all the farms have "occupants" but little or no farming activity is taking place. There is a real need for guidelines as to how and what should be done to get farming going.

The climate is hot and dry with a rainfall in the region of 600mm per year and a high evaporation rate. Rainfall is unreliable with at least one year in two drier than the average, according to the long term data.

Climatic data Rust de Winter based on data from Towoomba and Roodeplaat the two closer weather stations.

	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	Total
Ave. max temp	29.4	29.0	27.9	25.4	23.0	2.02	20.6	23.4	26.7	28.1	29.3	29.6	
Ave. min temp	16.7	16.4	14.6	10.8	6.0	2.2	2.4	4.6	9.0	12.8	14.8	16.0	
Ave rainfall	117.6	92.1	69.2	38.2	6.5	7.8	3.7	6.0	20.8	38.5	99.2	123.3	622.9
Ave. evap/day	7.5	6.6	6.0	4.7	4.3	3.6	4.0	5.5	7.5	8.0	7.7	7.8	
Ave sun hours	8.5	8.6	8.4	7.9	8.7	8.7	9.1	9.4	9.3	9.1	8.5	8.6	
Total wind	3917	3311	3225	2893	2831	2972	3258	4268	4768	5403	4811	4268	

Frost occurs and approximately 10 frost days can be expected each year. Occasional black frost occur which can cause severe damage. The region is characterised by dry and wet cycles, but a very dry year can be expected at least once every 10 years. When very dry years follow on each other a disaster drought happens and total failure of all enterprises can be expected.

Soils are good red sandy loams falling in the Hutton form, ranging from a Shorrocks series to a Makatini series (the clay contents range from 15 to 35%). The pH of the soils is slightly acid to neutral with most soils high in lime.

The general conditions imply that rain fed agriculture is risky, and planning is required to lower the risk. Originally Rust de Winter was planned as an irrigation scheme with sufficient water for fairly large scale irrigation. The source

of water is the Rust de Winter dam on the Elands River. The Elands River does not have a large catchments area and the dam is often not full.

Since the original planning large scale residential development has taken place down stream, where an additional dam has been built. The Elands river catchments seldom provide enough water for both dams. Rust de Winter lies between the two dams. The department of Water Affairs & Forestry has allocated a total area of 165ha for irrigation on the farms concerned.

To conduct a study of this area it is necessary to:

- Do a livelihood analysis and develop an initial farm typology to assist the targeting of any future development efforts (e.g. training). General educational standards, management and marketing skills as well as agricultural ability should be taken into account.
- Benchmark the agro-ecological resources of the study area taking into account historical and future developments
- Determine in collaboration with various agricultural institutions and commercial farmers promizing local farming and marketing practices.
- Identify and prioritise relevant development strategies that will assist the drawing-up of future business plans for different target groups among the Rust de Winter farmers.

Team Composition

M. Dinah Modiba	ARC-SRL provincial Coordinator	Crop Production
J. Vuyo Mafu	Fort Hare University	Animal Production, Extension
Lindie Botha	Free State University	Agricultural Economics
Thembi Ngcobo	ARC-SRL	Rural Resources Management
James Mulaudzi	Madzivhandila College	Animal production
Doctor Mmakola	Tompi Seleka College	Agricultural Economics

Objectives of the study

To analyse the current livelihood systems of the target area population that utilise farms at Rust de Winter in order to develop an initial farm typology for better targeting of future development efforts.
To analyze the past and expected changes in the farming practices among the Rust de Winter farmers, specifically in relation to the decrease in availability of irrigation water and the effects of land tenure and land claims.
To identify potentially relevant farming and marketing practices for Rust de Winter farmers.
Identify and prioritize relevant development strategies and their related activities to assist the formulation of future development programmes for different target groups among the Rust de Winter farmers.

Form of the final report

Before leaving South Africa the team will produce and hand over a draft report, which will include an executive summary and main document not exceeding sixty pages. This document should contain figures, tables and graphics. Its value will be greatly enhanced if it is structured to be of use to non-scientists, such as provincial legislators and municipal official, responsible for local government.

Other interested institutions

Besides those institutions that have been listed in the institutional framework, other parties likely to benefit from the field study are DOA (Department of Agriculture) and District Offices in Waterberg, Municipalities, the Gauteng province, NGO's and service providers operating in the province and district.

Field study process

Shortly after arrival in the area, the team will complete a brief reconnaissance survey of the study area, and will present its field study research and work plans to the LDA, WDM and other interested stakeholders in an introductory workshop. The purpose of this presentation is to enable the study team to receive feedback from the

stakeholders on the proposed research plan and approach. The team shall organize regular feedback sessions with a monitoring group (with officials from LDA and WDM) that will be formed prior to the team's arrival. This group will provide support as needed, and monitor the progress of the team. The feedback sessions will also present an opportunity to highlight issues on which the team could focus. If deemed necessary a mid-term workshop will be held halfway through the study period, at which time the team will present its early findings and its views on potential development strategies. Final results of the field study will be presented in the form of a draft final report. This will be discussed at a final workshop involving all stakeholders. This workshop will be held a few days before the end of the field study to allow the incorporation of useful comment/s into the final version that will be submitted before the team leaves Limpopo.

A senior ICRA officer will review the field study in two visits of approximately 10 days each (includes travelling). The first visit will be in the first week of the team's field study to participate in the planning of the fieldwork and development of a sampling framework. The second visit will be scheduled to attend the final workshop and to assist the team in organizing its final field study report.

Field study responsibility

The team is collectively responsible to LDA, ARC and ICRA for respecting the terms of reference and for the use made of the resources that these institutes provide for the field study. The team will maintain regular contact with the monitoring/support group. The team will be responsible for its own internal management. Within the limits specified in the terms of reference and in the budget, the team is free to decide its own approach, methodology, tools and action plan, as well as the use of resources provided. Important questions concerning the terms of reference raised during the field study should be clarified in a discussion with the monitoring group.

Means

ICRA, LDA and the Monitoring group are responsible for the provision to the ICRA team of the means specified in the Memorandum of Understanding (MOU).

APPENDIX 2: RESEARCH PLAN FOR THE FIELD STUDY 2005

Central research question (CRQ): What opportunities are there for commercial agricultural production for the Rust de Winter Farm in recognition of limited irrigation potential?

Tertiary Research Question (TRQ)

	RESEARCH QUESTIONS	**POTENTIAL ANSWERS**	**INFORMATION NEEDS**	**INFORMATION SOURCE**	**CHOICE OF METHODS**	**EXPECTED OUTPUT**
SRQ	***Secondary Research Questions (SRQ) What livelihoods exist in the Rust*** de Winter farms?					
TRQ	1. What activities are the people in engaged in to make a living?	Crop farm, livestock farm, off-farm	Level of contribution of each source to total household income	Farmers	Farm survey & Field Observation	Identified initial typology
TRQ	2. What is the rate of unemployment	With high unemployment rate, there exist a potential for agriculture to contribute to livelihoods	Difficulties in livelihoods	Farmers	Secondary Data	Identified opportunity for agriculture
TRQ	3. Are there any people making a living outside the farm? 3.1 How do those activities contribute to livelihoods on the farm? 3.2 What are the major sources of income of the residents of Rust de Winter?	Income from off-farm employment is rarely used for agriculture Off-farm employment is favoured over agriculture	Statistics indicating importance of off-farm activities	Farmers & Secondary Data	Farm survey, semi structured interviews	Livelihoods identified
TRQ	4. What factors limit or determine engagement in a specific form of livelihood?	Income needs & shortage of water determines engagement in agriculture	Constraints determining engaging in livelihoods	Reading Secondary Data	Farm survey & Focus Group Discussions	Livelihoods analysis
TRQ	5. Who in the area are involved in farming?	Elderly men and women, unemployed, those with access to water	Different types of farmers and their objectives	Farmers, LPDA documents	Farm survey & Focus Group Discussions	Assessment of people involved in farming
SRQ	***What opportunities for succeeding in agriculture can be identified?***					
TRQ	6. What potential opportunity are there for the future	The adaptable crops can be commercially grown Resources and markets allow for commercial crop production	Potential markets	Market outlets	Semi structured Interviews & secondary data	Assessment of market demand

	RESEARCH QUESTIONS	POTENTIAL ANSWERS	INFORMATION NEEDS	INFORMATION SOURCE	CHOICE OF METHODS	EXPECTED OUTPUT
TRQ	7. What opportunities were there in the past, why are they no longer explored?	Crops adaptable to the local conditions	Perceptions of key stakeholders on exploiting past opportunities	Key informants	Semi structured Interviews	Assessment of market demands
TRQ	8. What are the changes in the opportunities, what causes the changes	Reduced water availability have changed types of crops grown	Information on market hindrances	Market outlets	Semi structured Interviews & Secondary data	Assessment of market demand
TRQ	9 What opportunities are currently being exploited?	Markets exist for commercialization of agriculture	Information about profitability of different types of farmers	Market outlets & Commercial farmers	Semi structured Interviews	Determine market
TRQ	10. What are the opportunities that R de Winter farmers can pursue to be commercial?	Land, farm equipment, markets and extension service can support commercialization	Infrastructure (how & where farmers sell their produce)	Market outlets & Commercial farmers	Semi structured Interviews	Market demand analysis
TRQ	11. What services are being rendered to support the opportunities to make agriculture commercially viable?	Extension services advice farmers on crops on demand	List of stakeholders and their perception of contribution their make to solve the problem	Key Informants	Semi structured Interviews	Awareness of type of service provided
TRQ	12. What steps are being undertaken to get farmers producing for markets	Organizing farmers into groups for bulk buying and transporting to markets	Roles played by various stakeholders	Key informant	Semi structured Interviews	Awareness of type of service provision & identify areas of improvement
SRQ	***What are the determinants for successful agricultural production? (viability***)					
TRQ	13. What commercial enterprises exist	Commercial production is possible in the area Enterprises existing are not a threat to Rust de Winter farmers	List of key enterprises	Commercial farmers, key informants	Semi structured Interviews	Linking farmers to markets
TRQ	14. What farming resources are necessary to ensure commercial production?	The resources that farmers have are not adequate/fully functional for commercial production	Resources required if producing commercially	Commercial farmers, farmers & key informants	Semi structured Interviews	Assessment of resources
TRQ	15. What factors distinguish subsistence from commercial farming?	Understanding of what is considered commercial	List prevailing factors	Farmers	Semi structured Interviews	Assessment of factors limiting production

	RESEARCH QUESTIONS	POTENTIAL ANSWERS	INFORMATION NEEDS	INFORMATION SOURCE	CHOICE OF METHODS	EXPECTED OUTPUT
TRQ	16. What hectares are required for a farmer to be regarded as commercial (enterprise)	Land at farmers disposal can be used productively	Information on types of enterprises suitable for Rust de Winter farmers	Farmers & other stakeholders	Semi structured Interviews	Farm Typology
TRQ	17. What are the characteristics for commercial production?	Good business and farm management skills are necessary for commercial production	Information about profitability of different types farmers and good business traits	Farmers & other stakeholders	Focus Group discussion & Semi Structured Interviews	Assessment of factors to penetrate & develop markets
SRQ	***What marketing strategies are needed for commercial production***					
TRQ	18. Who supplies the local markets?	Local markets are keen to have Rust de Winter supply supermarkets	Market assessment	Fresh Produce markets and supermarkets	Semi structured interviews	Market demand analysis
TRQ	19. What are the possibilities of markets accepting produce from small scale farmers?	Community responsive outlets are available in the area	Information on potential markets	Fresh Produce markets and supermarkets	Semi structured interviews	Commitment to accept produce from Rust de Winter farmers
TRQ	20. What is the quality standards required from farmers supplying raw materials?	High quality standards are possible exclusion factor for small scale farmers	Quality determinants of potential markets	Fresh produce markets and supermarkets	Semi structured interviews	Information on quality standards
TRQ	21. What are possibilities for small scale farmers to enter your procurement	Market conditions are conducive to penetration by small scale farmers	Information on procurement system	Fresh produce markets and supermarkets	Semi structured Interviews	Information on procurement system
SRQ	***What are the policy implications on commercials production?***					
TRQ	What criteria do you use to select farmers that you give leases to/ options to buy or land claims?	Resources such as land prevent optimum commercialization	Information of land tenure systems	Departments of Land Affairs & Agriculture	Semi structured interviews & Questionnaire	Clarity on land tenure
TRQ	Are the lessees allowed to sublease their land, if/when they are not using it?	Ineffective utilization of land prevents full commercialization of agriculture in the area	Details of lease arrangements	Departments of Land Affairs & Agriculture	Semi structured interviews & Questionnaire	Assessment of farms in use and those not being used

	RESEARCH QUESTIONS	POTENTIAL ANSWERS	INFORMATION NEEDS	INFORMATION SOURCE	CHOICE OF METHODS	EXPECTED OUTPUT
TRQ	24. What are the land ownership rights of those farm workers who have been on the farms before the current lessees came along?	Farm ‘’occupiers have better rights to the land than the current lessees	Clarity on farm tenancy	Departments of Land Affairs & Agriculture	Semi structured interviews & Questionnaire	Appreciation of tenure rights
TRQ	25. How do you ensure compliance of the specific lease contracts, e.g. using the land fully for agricultural purpose?	Responsible bodies have not effectively dealt with subleasing	Perceptions on subleasing	Departments of Land Affairs & Agriculture	Semi structured interviews & Questionnaire	Identify body responsible
TRQ	What happened in terms of land tenure on the farms between 1981 and 1992?	Historical tenure systems have contributed to current status quo	Historical perspective on land tenure	Key informants	Semi structured interview	Understanding of land tenure
TRQ	27. What is the current status of the land claims on the Rust de Winter farm?	Farmers leasing are the likely beneficiaries of the land	Clarity on the status of the land tenure	Department of Land Affairs	Semi structured Interviews	Clarity on possibility of farmers getting ownership of the land
SRQ	***What are the limitations to commercial viability in R de W***					
TRQ	28. What problems hinder the possibility of commercial production in R de W?	Causes of reduction in crop production	Statistics, trends and causes of decreasing yield	Stakeholders	Semi structured interviews	Analysis of cropping in the area
TRQ	29. What factors limit the availability of irrigation water?	Drought and supply to neighbouring areas have had an impact of water on reduced crop production	Information on factors limiting production	Stakeholders	Semi structured interviews	Analysis of cropping in the area
TRQ	30. What steps have been taken to overcome these limitations?	Ineffective support systems impede commercialization of agriculture	Perception of interventions Service provision & potential	Stakeholders	Semi structured interviews	Analysis of stakeholder roles

APPENDIX 3: FIELD STUDY TIME TABLE

Date	What	Where	Who / With who	Outputs
Saturday 09/04/05	Leave Wageningen for South Africa	Schiphol airport to Johannesburg International airport	SA-ICRA Team (*)	Team in South Africa
Sunday –Monday 10-11/04/05 Week 1	Off		*	
Tuesday 12/04/05	Arrival at temporary stay in Tompi Seleka		*	Team at Tompi Seleka
Wednesday 13/04/05	Arranging transport & logistics	Marble Hall	*	Field study preparations
Thursday 14/04/05	Arrival of ICRA reviewer Introductory visit at Towoomba Inspecting progress on accommodation preparation Reconnaissance study	Tompi Seleka Towoomba Agricultural Research Station(TARS) Rust de Winter Farm (RdWF)	Dr. Enserink * *, Ms. Mpe and Dr. Jordaan * and Mr. Mmethi	 Initial introduction to Towoomba staff Get clarity on progress and potential date of moving in Familiarization with RdWF and the study problem at hand
Friday 15/04/05	Purchase office materials Drafting detailed planning schedule Drafting stakeholders introductory letter Clarifying TOR	Polokwane Tompi Seleka Tompi Seleka Tompi Seleka	Thembi, Vuyo, Doctor Lindie, Dinah, James * *	 Organized Field Study work plan Common understanding of TOR
Saturday 16/04/05	Divide, read and summaries secondary data Contextual analysis Draft report outline	Tompi Seleka	* * Vuyo, Doctor	 Rich picture Report outline
Sunday 17/04/05 Week 2	Move to Towoomba	From Tompi Seleka to TARS	*	Team at Towoomba Agricultural Research Station
Monday 18/04/05	Develop research questions hierarchy Develop draft farmers transect guidelines and questionnaire Develop question guidelines for key informants Meeting with Limpopo task team (LPTT)	Work station Workstation TARS	* * * * with LPTT	Research questions Prepared for farmer interviews Prepared for key informant interviews Final confirmation on TOR Stakeholders identified and prioritized Revised contextual analysis

Date	What	Where	Who / With who	Outputs
Tuesday 19/04/05	Meet with key informants (Mr. Sithole) Meet with key informants (Mr. Robinson) Meeting on issues related to institutional study with Dr.Verschoor Departure of ICRA reviewer	RdW (Gauteng office) TARS Work station	Doctor, Thembi Lindie, Dinah * Dr. Enserink	To fill information gaps Gain information on RdW history Prepared for Institutional study
Wednesday 20/04/05	Introductory meeting with farmers Transit walks, observation and interview with individual farmers Revise questionnaire	RdWF RdWF Work station	* * *	Team introduced to farmers Initial farmer interviews Final questionnaire
Thursday & Friday 21-22/04/05	Transit walks, observation and interview with individual farmers Send stakeholder letters	RdWF TARS	* Dinah	Farmer interview to identify topography Team introduced to stakeholders
Saturday 23/04/05	Initial data analysis	Work station	Vuyo, Dinah, Thembi	Data structured
Sunday **24/04/05** **Week 3**				
Monday 25/04/05	Data analysis Make appointments with stakeholders Listing existing strategies and aspired strategies used by farmers ICRA reviewer return	Work station	Lindie Dinah, Thembi * Dr. Enserink	Data sheet layout and results Arranged meetings Farmers perspective of strategies considered
Tuesday 26/04/05	Start report writing	Work station	*	Report writing started
Wednesday (national holiday) 27/04/05	Preparation of stakeholder Develop questionnaires for stakeholders Revise list of strategies Task division for report writing Personal interviews with reviewer	Work station	Vuyo * * Dr Enserink	Prepared for all stakeholder interviews Strategies updated Report writing task divided Team evaluation and mediating
Thursday 28/04/05	Stakeholder interview (Mr. Hayden) Stakeholder interview (DWAF - Mr. Erasmus) Stakeholder interview (LPDA – Ms. Mpe) Report writing	TARS TARS	Lindie, Dinah Thembi, James	Gain commercial farmer in partnership's perspective Gain DWAF's perspective Gain LPDA's perspective

Date	What	Where	Who / With who	Outputs
	Departure of ICRA reviewer	TARS Work station	Doctor, Vuyo * Dr. Enserink	Progress on report, up to Chapter 4
Friday 29/04/05	Report writing Stakeholder interview (Pick 'n Pay, Warmbaths)	Work station Bela-Bela	* Dinah	Progress on report, up to Chapter 4 Gain Supermarket's perspective
Saturday 30/04/05	Report writing	Work station	*	Progress on report, up to Chapter 4
Sunday 01/05/05 Week 4				
Monday (national holiday) 02/05/05	Report writing Arrange focus group meeting with farmers Prepare presentation for monitoring group meeting Prepare meeting with monitoring group	Work station	* Dinah * *	Progress on report, up to Chapter 4 Prepared for focus group discussion Mid-term report presentation Prepared for mid-term meeting
Tuesday 03/05/05	Meeting with monitoring group Stakeholder interview (NTK Warmbaths)	TARS Bela-Bela	* with LPTT James, Doctor	Study progress report to LPTT Gain NTK Warmbath's perspective
Wednesday 04/05/05	Focus group discussion with targeted farmers Stakeholder interview (SPAR, Warmbaths)	RdWF Bela-Bela	* Lindie, Vuyo	Information of farmers included in the focus of the study Gain supermarket's perspective
Thursday 05/05/05	Stakeholder analysis Stakeholder interview (NTK Settlers) Stakeholder interview (Marble Hall Fresh Produce Market)	Work station Settlers	* Dinah, James Doctor	Drafted stakeholder analyses Gain NTK Settler's perspective Gain MHFP's perspective
Friday 06/05/05	Distribute and read up to Ch4 Stakeholder interview (Mr. Prinsloo, commercial farmer) Stakeholder interview (Land bank – Modimolle) Stakeholder interview (RESIS) Scenario and Strategy analysis	Workstation RdW Modimolle Polokwane Work station	* Lindie, Vuyo Thembi, Doctor, James Dinah, James, Doctor Lindie, Vuyo, Thembi	Mainstreaming and editing of report, up to Chapter 4 Gain farmer in partnership's perspective Gain Land Bank's perspective Gain RESIS's perspective Scenario thinking and strategies development

Date	What	Where	Who / With who	Outputs
	Report writing (Chapter 5, 6, 7) Arrange workshops and invite farmers and stakeholders	Workstation	* Dinah	Progress on report, Chapter 5-7 Progress on workshop arrangements
Saturday 07/05/05	Invite farmers to workshop Report writing	Workstation Workstation	Thembi, Dinah *	Progress on workshop arrangement Progress on report, Chapter 5-7
Sunday 08/05/05 Week 5	Mainstreaming of all information Review draft report (Up to Chater4) Report writing (changes up to Chapter 4)	Workstation	* * *	Common understanding of all available information Team editing on report, up to Chapter 4 Changes on report, up to Chapter 4
Monday 09/05/05	Handing in final version of report, up to Chapter 4 Prepare for workshops (10/05/05) Stakeholder interview (Mr. de Villiers) – Not available due to illness Listing & screening of potential strategies Develop criteria for prioritization	Workstation Workstation RdW Workstation	* Doctor, James (morning) and * (afternoon) Lindie, Dinah * *	Report, up to Chapter 4 Progress on workshop preparation N.A. – postponed for telephonic interview on Wednesday Final strategies before workshops Prepared for prioritization at workshop
Tuesday 10/05/05	Meeting with key informant (Mr. Mmethi) Stakeholder interview (DLA) Workshop preparation Report writing Chapter 5,6,7	TARS TARS Workstation	Dinah, Thembi Lindie, Thembi, Vuyo * *	Key informant updated, and gained his opinion Gained DLA's perspective Progress on workshop preparation Progress on report, Chapter 5-7
Wednesday 11/05/05	Telephonic stakeholder interview (Mr Pretorius) Telephonic stakeholder interview (Mr. de Villiers) Workshop for farmers (dry land, irrigation) on prioritization of strategies Workshop for stakeholders on prioritization of strategies	Workstation RdW TARS	Lindie Doctor, Dinah, Vuyo Lindie, Thembi, James	Gain DWAF's perspective Gain commercial farmer's perspective Strategies prioritised and stakeholder linkages finalized by RdW Farmers Strategies prioritised and stakeholder linkages finalized

Date	What	Where	Who / With who	Outputs
	Mainstream last interviews		*	by various stakeholders
	Mainstream workshop results	Workstation	*	Common understanding of last interviews
				Common understanding of workshops and strategies finalized
	Report writing		*	
	Hand in and distribute Report (Chapter 5-7)		*	Progress on report, Chapter 5-7
	Task division for report writing, Chapter 8,9			1'st draft on Chapter 5-7
			*	Task divided for report writing, Chapter 8,9
Thursday 12/05/05	Telephonic stakeholder interviews (Mr. Basson)	TARS	Lindie	Gain commercial farmer's perspective
	Reading and editing Chapter.5,6,7			Mainstreaming and editing of report, Chapter 5-7
		Workstation	*	
	Report writing, Chapter 8,9			Progress on report, Chapter 8,9
	Review Chapter 5-7			Team editing on report, Chapter 5-7
	Edit report, up to Chapter 4		*	
			Doctor, Vuyo	Report, up to Chapter 4, final edited
				Organized external editing
	Arrange external editors			
			*	
Friday 13/05/05	Report writing, Chapter 8,9	Workstation	*	Progress on report, Ch8,9
	Report writing – changes on Chapter 5-7		*	Changes on report, Ch5-7
Saturday 14/05/05				
Sunday 15/05/05 Week 6	Distribute and read Chapter 8,9			Mainstreaming and editing of report, Chapter 8,9
	Handing in final version of report, Chapter 5-7			Report, Chapter 5-7
Monday 16/05/05	Edit report, Chapter 5-7	Workstation	Doctor, Vuyo	Report, Chapter5-7, final edited
	Review Chapter 8,9		*	Team editing on report, Chapter 8,9
	Final report writing, Chapter 8,9		*	
	Handing in final version of report, Chapter 8,9		*	Changes on Chapter 8,9
	RSVP's for final workshop			Report Chapter 8,9
			*	Invitations finalized for final workshop
	Arrange Institutional study program			Prepared Institutional study plan
			*	
Tuesday 17/05/05	Edit Chapter 8,9	Workstation	Doctor, Vuyo	Report, Chapter 8,9, final edited
				Prepared for final workshop

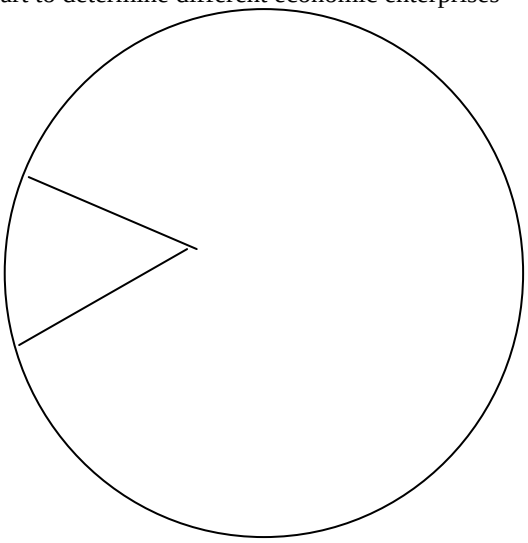
Date	What	Where	Who / With who	Outputs
	RSVP's for final workshop Do presentation for final workshop Arrange Institutional study program	Workstation Workstation Workstation	* * *	Prepared for final workshops Prepared Institutional study plan
Wednesday 18/05/05	Prepare for final workshop Printing and distributing draft report for external editors	Workstation	* *	Prepared for final workshop External editing
Thursday 19/05/05	Arrival of reviewer Final Workshop Incorporate workshop comments in report	 TARS Workstation	Dr. Enserink * *	 Study results presented Comments incorporated
Friday 20/05/05	Final editing on report Departure for weekend	Workstation	* *	Report final edited
Saturday 21/05/05	**Off**			

* The whole team was involved

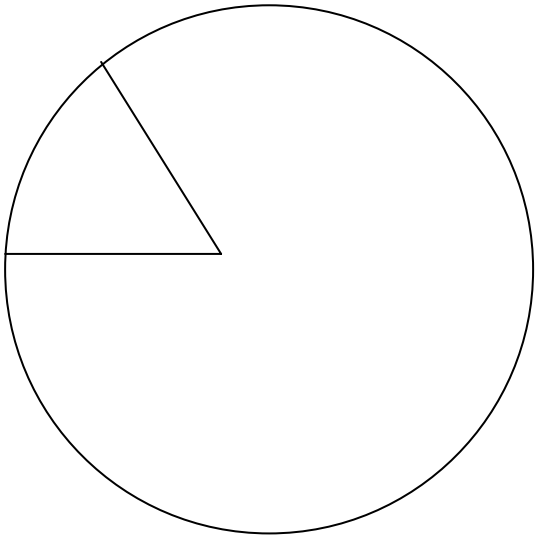
APPENDIX 4: SUMMARY OF SEMI STRUCTURED INTERVIEWS

4.1 FARMER INTERVIEWS ON LIVELIHOODS

1. What activities are people in Rust de Winter farms engaged in to make a living?
    a) Draw a pie chart to determine different economic enterprises



2. What farming enterprises are people involved in? – Pie chart



3. Where is your mainstay? Rust de Winter farms or Outside areas?
4. When did you occupy the land?
5. Who occupied the land before you?
6. What specific problems do you experience regarding the land tenure?
7. Are you cultivating under irrigation or dry land conditions?
8. How many hectares do you have under irrigation and dry land?
9. What water sources do you have and use?
10. What problems do you experience with your water sources?
11. What changes has occurred in water sources over time?
12. What agricultural opportunities existed in the past, which are not done anymore?
13. Why are they no longer exploited?
14. What are the changes in the opportunities?
15. What are the causes of changes?
16. What potential opportunities are there for the future, in terms of Livestock and Arable farming?

4.2 FOCUS FARMER GROUP

1. How long have you been involved in farming? (Years of experience, especially in commercial crop production)
2. How much land (hectares) do you have access to?
    a. Own/leased
    b. Rented/hired from another farmer (subleased)
    c. Borrowed
    d. Shared
3. What crops are you growing in the land? What is the area planted to each crop?
4. Which of these crops are produced under irrigation and which ones are under dry land?
5. Where do you sell your produce?
6. What specific procedure did you follow to enter the market?
7. How do you get your produce to the market?
8. What are the major obstacles that hinder the way you'd like to farm, in terms of the following:
    a. Inputs
    b. Yields
    c. Financial support
    d. Extension services
    e. Equipment/mechanization
    f. Marketing
    g. Policies?
9. Is there any governmental or any other support you are getting currently or you got in the past? Specify from whom and when?
10. Do you belong to any farmer's organization? If yes,
    a. What is its name?
    b. What kind of farmers does it cater for?
    c. How does it help you/its members?
    d. Affiliation fee

    If the answer is no, then why are you not interested in joining farmers' organizations?
11. What is your opinion on the unity among farmers at Rust de Winter?
12. How do you obtain information for your farming activities?
13. How do you obtain information for marketing of your produce?
14. What is the minimum size of land that is profitable for farmers for each enterprise?
15. What are your views about having contracts with white farmers?
16. What potential opportunities are there for future commercial crop and livestock production in Rust de Winter?
17. What could be the solutions for the decreasing crop production in Rust de Winter?
18. Does the fact that the other farmers are not cultivating their farms affect you or your farm activities?

4.3 GENERAL CHECKLIST FOR STAKEHOLDERS

1. What do you think are the causes for the reduction in crop production on the Rust de Winter farms? Please rank these in order of importance.
2. What are your perceptions about the future of crop production on these farms?
    a) land claims
    b) Land ownership
    c) Water limitations
3. What do you think are the reasons for farmers to shift from crop farming to livestock farming?
4. What are the characteristics of a commercial farmer on the Rust de Winter farms?
5. What minimum size of land could a farmer crop to be profitable for each enterprise?
6. Are you aware of other farmers who are successfully exploiting the markets?

4.4 DEPARTMENT OF AGRICULTURE

1. How do you interact with farmers?
2. Is there any kind of support you provide them? What do you provide?
3. What do you think has led to the reduction of crop production on the Rust de Winter farms?
4. What are your perceptions on the major obstacles that hinder the way the farmers would like to farm, in terms of the following?

a) Inputs
b) Yields
c) Financial support
d) Extension services
e) Equipment/mechanization
f) Marketing
g) Policies?

5. How do you see the future of commercial crop production in Rust de Winter?
6. What possibilities exist for dry land farming?
7. What opportunities existed in the past for crop production and livestock?
    a) Why are these no longer exploited?
    b) Are there any possibilities of revisiting these opportunities?
8. What could be the issues that need to be considered in the future for profitable crop production?

4.5 DEPARTMENT OF LAND AFFAIRS

1. What do you think are the causes for the reduction in crop production on the Rust de Winter farms? Please rank these in order of importance.
2. What are your perceptions about the future of crop production on these farms?
3. What do you think are the reasons for farmers to shift from crop farming to livestock farming?
4. What are the characteristics of a commercial farmer on the Rust de Winter farms?
5. What minimum size of land could a farmer crop to be profitable for each enterprise?
6. Are you aware of other farmers who are successfully exploiting the markets?
7. What criteria do you use to select farmers that you give
    a) leases to
    b) options to buy
8. Are the lessees allowed to sublease their land, if/when they are not using it?
9. What are the land ownership rights of those farm workers who have been on the farms before the current lessees came along?
10. What happened in terms of land tenure on the farms between 1981 and 1992?
11. What is the current status of the land claims on the Rust de Winter farm?
12. How do you ensure compliance with the specific lease contracts (e.g. using the land fully for agricultural purposes)?

4.6 DEPARTMENT OF WATER AFFAIRS AND FORESTRY

1. How is water allocated to the farmers? How does the quota system work?
2. What is the local capacity for use/division of water?
3. What is the power of farmers to claim for more water?
4. What are the possibilities of farmers being allocated more water than they are currently getting?
5. What happens with the allocated quota that is not being used by farmers?
6. What are the different demands for water and how does it affect the availability of irrigation water?
7. Do the farmers have to pay for the water allocated to them or just pay for the water they used?

4.7 LAND BANK

1. What services to you render to the farmers?
2. What form of funds do you provide to farmers (cash/voucher/pay to supplier/grant) and how do you decide whether to give cash/voucher/pay to supplier/grant.
3. What is the minimum amount of money you lend to the farmers?
4. What form of guarantee do you require as collateral for loans?
5. What qualities do you look for in a farmer before issuing a loan?
6. What methods of payment?
7. Have there been changes in your clientele?
   a) What have been the changes?
   b) What could be the causes of such changes?
8. How long does it take to process to process a loan or a grant? Farmers have complained that the amount offered by the bank is the same as it was years ago, what are your perceptions?
9. What do you think has led to the reduction of crop production on farms such as the Rust de Winter farms?
10. How do you see the future of commercial crop production in Rust de Winter?
11. What possibilities exist for dry land farming?
12. What opportunities existed in the past for crop production? Livestock?
    a) Why are these no longer exploited?
    b) Are there any possibilities of revisiting these opportunities?
13. What could be the issues that need to be considered in the future for profitable crop production? Livestock?
14. What specific complaints do your office receive from farmers, how do you deal; with these?

4.8 COMMERCIAL FARMERS

1. How long have you been farming on the Rust de Winter farm?
2. What do you think are the causes for the reduction in crop production on the Rust de Winter farms? Please rank these in order of importance.
3. What could be the solutions for the decreasing crop production in Rust de Winter?
4. What are the characteristics of a commercial farmer on the Rust de Winter farms?
5. What minimum size of land could a farmer crop to be profitable for each enterprise?
6. What procedure did you follow to acquire water from the Rust de winter farm?
7. What is your market outlet?
8. What are your views about having contracts with the RDW farmers?
   a) What benefits do the farmers derive from these contracts?
   b) What are your benefits from the contract?
   c) What do you think constrain other farmers to be part of your contract?
9. What is the selection criteria that you for seed maize farmers?
10. How long is the contract that you have with the farmers?
11. What will happen after the end of the contract?
12. How will the outcome of the land claim affect your contract with the farmers?
13. What potential opportunities are there for future commercial crop and livestock production in Rust de Winter?
14. What are your perceptions about the future of crop production on these farms?

4.9 SUPERMARKETS

1. Who are your current suppliers?
2. If not already doing so, what are the possibilities of your store accepting supplies from small-scale farmers?
3. What quality standards do you require from farmers who are supplying you with raw materials?
4. What are the possibilities for small-scale farmers to enter your procurement system?

4.10 COOPERATIVES

1. When was the cooperative s formed?
2. Who are your members? How many are they?
3. What services do you provide for your members?
4. Have there been changes in membership?
    a) What have been the changes?
    b) What caused the changes?
4. Are there any possibilities of revisiting these opportunities?
5. What are the causes of reduction of crop production on the Rust de Winter:
6. What is your perception regarding the future for commercial crop production?

APPENDIX 5: SUMMARY OF QUESTIONAIRES OF THE RUST de WINTER FARM

Purpose:: To analyze the livelihoods of farmers on the farm.

Questions	Info needs	Answers provided
1. What are the activities are the people on the Rust de Winter farm engage in to make a living apart from farming?	▪ Perceptions of people on livelihoods	▪ Self employed, Pensioners, Government employees- principal, policemen, attorneys, Selling fruits and vegetables on streets
2. What farming enterprises are people involved in?	▪ Identify farming activities on the farm	▪ Livestock- cattle, goats, sheep, pigs, chicken ▪ Grain crops- maize, wheat, sunflower, watermelon, ▪ Vegetable crops-tomatoes, beetroots, cabbage, onions
4. When did you occupy the land?	▪	▪ 1992 -1994
5. Who occupied the land before you?	▪ History of the farm	▪ The white farmers followed by the STK
6. How did you occupy the land?	▪ info on land tenure	▪ Initially, illegal invasion and from 1994 got leases
7. What specific problems do you experience regarding the land tenure?	▪ Effect of land claims on social stability	▪ Unsettled land claims put pressure on farming activities ▪ Uncertainty of the land claim outcome make them feel unsettled ▪ Access to credit at land Bank since leased land does not offer them collateral for loan application
8. Are you cultivating under dry land or irrigation?	▪ Farming methods being practiced	▪ Few farmers cultivate under dry land conditions
9. How many hectares do you have under irrigation and dry land?	▪ information on hectares of farming systems	▪ 5-30 ha under irrigation ▪ 25ha under dry land
10. What water sources do you have and use?	▪ Infrastructure for water	▪ Rust de Winter dam ▪ Boreholes
11. What problems do you experience with the water sources?	▪ Status of the infrastructure	▪ Many boreholes are not working ▪ Water from the Rust de winter farms is heavily controlled by DWAF
12. What changes has occurred in water sources overtime?	▪ Trends in water demands and use	▪ The allocation of water quotas that is insufficient fro cropping
13. What agricultural opportunities existed in the past, which are no longer explored?	▪ History of agricultural practices	▪ During the STK period mainly crop rotation was practiced, cotton, maize, sunflower, groundnuts with wheat and oranges were planted ▪ Livestock was also commercially kept
14. Why are they no longer exploited?	▪ constraints on commercial farming	▪ Water for irrigation is limited, Poor infrastructure Lack of knowledge
15. What are the changes in the opportunities?	▪ Driving forces	▪ The land is mostly fallow since it is under utilized ▪ Water for irrigation has dramatically declined by quotas ▪ Lack of access to functional farming implements

Questions	Info needs	Answers provided
16. What are the causes of changes?	▪ Influence of policies	▪ Limited water for irrigation due to other pressing demands for domestic and industrial purpose ▪ Introduction of water quota system ▪ Lack of funds for infrastructure repairs ▪ Lack of accessibility of extension support
17. What potential opportunities are there for the future, in terms of livestock and crop production?	▪ Perceived solutions	▪ If farmers can be capacitated, have access to extension and other relevant support services, resources, livestock farmers will commercialize their enterprise and do feedlot ting since land does not provide enough space for grazing ▪ Crop farmers will expand their scale of production, incorporate high value crops and practice crop rotation for efficient utilization of land and resources

APPENDIX 6: SUMMARY OF QUESTIONAIRES ON THE RUST de WINTER FARM: FARMER FOCUS GROUP AND STAKEHOLDERS

PURPOSE: Determine perceptions on challenges and possible solutions for Rust de winter commercial arable farming

Questions	Info needs	Answers provided
1. How long have you been involved in farming? Years of experience especially in commercial production?	▪ experience in farming	▪ some more than ten years ▪ ranges from 0 to more than 10 years
2. How much land do you have access to? a) Own/leased b) Subleased c) Shared d) borrowed	▪ ownership status of the farm	a) varies from 25 ha to more than 200ha b) mostly farmers who are not active in farming subleased their land to livestock grazing c) none d) 1 farmer borrowed20ha for seed maize production
3. What crops are you planting on the land? What is the area planted for each type of crop?	▪ preferred crops for the area	▪ seed maize 30ha/farmer, sunflower 16 -30ha, water melon ½ ha maize 5ha
4. Which of these crops are produced under irrigation?	▪ information on irrigated crops	▪ seed maize, sunflower, wheat
5. Where do you sell your produce?	▪ information on market outlets	▪ seed maize – Pioneer hybrid company ▪ sunflower & maize- NTK ▪ vegetables –pension pay puts, Hammanskraal market
6. How do you get your produce to the market?	▪ support available	▪ own transport, hire transport
7. What are the major obstacles that hinder the way you would like to farm in terms of the following: a) inputs b) yields c) financial support d) extension services e) equipment/mechanization f) marketing g) Policies	▪ farmer financial capabilities	a) very expensive b) climatic changes, mainly rainfall pattern is declining c) due to lack of financial support, they have off farm activities in order to buy inputs, of which the money is not sufficient d) limited access to extension services e) limited/ no access to equipments f) fluctuations of produce prices g) land claims waste time for development

Questions	Info needs	Answers provided
What are the major obstacles that hinder the way farmers would like to farm in terms of the following: a) inputs b) yields c) financial support d) extension services e) equipment/mechanization f) marketing g) Policies	LPDA views on farmers concerns	a. poor financial resources, lack of access to inputs b. lack of technical know how, insufficient water for irrigation c. support through CASP is put in place, but farmers have not access it yet, inability to repay loans d. shortage of staff e. limited farming implements, government does not render support to farmers anymore, inability of farmers to buy government implements as white farmers bid them at the auctions f. markets are there at NTK, Pretoria, prices vary between black and white farmers g. land claims hinders production on the farm, unfair and not transparent water allocation procedure
8. Is there any governmental support you are getting or you got in the past?	▪ Support available	▪ farmers on partnership gets support from their partners ▪ independent farmers, some get loans from Land Bank ▪ awaiting approval for LRAD by LPDLA ▪ empty promises
9. Do you belong to any farmer's organization? a) What is its name? b) What kind of farmers does it cater for? c) How does it help you or its members/	▪ information structure of farmers	▪ WUA, assisted by Ms Mpe to establish it ▪ farmers with water quotas ▪ links the farmers with DWAF, discuss water problems, advise one another
10. What is the opinion on the unity among farmers on the Rust de winter?	▪ Perception on social cohesion	▪ it is important for farmers to be organized farmers in partnership are united and have team work spirit
11. How do you obtain information for your farming activities?	▪ Information flow	▪ seed maize producers from the partner ▪ extension services to a limited extent ▪ neighbouring white commercial farmers
12. How do you obtain information for marketing of your produce?	▪ Information flow	▪ seed maize producers from the partner ▪ other farmers contact market outlets
13. What is the minimum size of land that is profitable for farmers per enterprise?	▪ Determine level of knowledge on farming	▪ **LPDA**: from 50-100ha ▪ **LDLA** Vegetable production- 5ha, Agronomic crops- 100ha ▪ **Commercial farmers**: at least 20ha ▪ **Land Bank** -25ha ▪ **farmers**: 30ha -irrigation (do crop rotation) & 100ha- dry land

Questions	Info needs	Answers provided
How would you define a commercial farmer?	▪ information on profitability different types of farmers and good business traits	▪ good planning of farming activities ▪ full time farmer, actively and fully involved ▪ produce for the market ▪ knowledgeable & apply practically ▪ access to information on recent developments in farming
19. How would you define a commercial farmer?	▪ information on profitability different types of farmers and good business traits	▪ **LPDA**- own farming machinery, secured market, well equipped on cropping systems, knowledgeable and able to access information, understand water allocation issues ▪ **LPDLA**- knowledge & skills, information on market possibilities, accessible infrastructure.
14. What are your views about having contracts with white commercial farmers? a) What benefits do you derive from these contracts? b) If not already involved, would you be interested? c) If no, why are you not interested?	▪ Perceptions on partnerships	▪ Farmers on partnership benefit from transfer of skills in farming, high income, management skills and improvement of resources, and to a limited extent the power in influencing 'policy', e.g. increase of water quotas from 5 to 30ha. ▪ learned to have self discipline, committed to farming and consider it as a business ▪ few farmers say yes, because of the evident benefits reaped by the involved farmers ▪ provided the contract term shorter & can be renewed annually ▪ no, lack trust in white people because of political issues ▪ feel that farmers in partnership are not fully involved in farming activities, thus, they are just regarded as land owners and not partners ▪ not support it, we should learn to acquire knowledge, apply it and render support to one another as black farmers
15. What potential opportunities are there for future commercial crop and livestock production on the Rust de Winter?	▪ production and market opportunities	▪ **LPDA**- opportunities for commercial production will be there provided there is enough water for irrigation, Dry land production is risky ▪ **LPDLA**- access to water, infrastructure, technical support, land ownership ▪ **Commercial farmers**: Livestock needs financing and good management, vegetable production because it has guaranteed market ▪ Crop farmers must have water rights for increased water quotas ▪ **NTK &market outlets** are prepared to buy products provide the quality is right ▪ **Land Bank**- possible but farers need capacity building

Questions	Info needs	Answers provided
What do you think are the causes for the reduction in crop production on the Rust de Winter?	▪ Limitations to agricultural production	▪ Water limitations ▪ Lack of funds which results in poor infrastructure, lack of inputs, improper soil management (no soil analysis done) ▪ Limited knowledge on farming ▪ Lack of access to extension services for technical know how, cropping practices, market information ▪ Low prices of produce
16. What could be the solutions for the decreasing crop production on the Rust de Winter farm?	▪ identifying Strategies for sustainable commercial crop production	▪ **LPDA & LPDLA** – provision of adequate water and necessary infrastructure ▪ **Commercial farmers**; allocate water for active farmers, expand the dam capacity ▪ **Land Bank** & **DWAF** soil analysis & cultivation of right crops ▪ **DWAF**- provision of adequate water, training of farmers, Partnerships for accessibility of infrastructure, Improved communication channels between departments can benefit the farmers ▪ **RESIS**- production of high value crops ▪ **Farmers** – improved infrastructure, Fair and equal distribution of water
Does the fact that other farmers are not farming affect you or your farm activities?	▪ views on efficient resource utilization	▪ Farmers: some can not afford due to lack of financial resources to farm productively, we also have been in that situation so we know how it feels ▪ their deserted farms attract wild animals which damage our crops ▪ lack of fire belts cause veld fires ▪ overgrazing of deserted farms causes soil erosion
17. What do you think are the causes for the reduction in crop production on the Rust de Winter? Please rank them in order of importance?	▪ constraints to agricultural production	▪ **LPDA** – lack of access to water, infrastructure & mechanization, under utilization of land, conversion form crop to livestock farming, lack of farmers' interest on farming ▪ **LPDLA**- bore holes re not being used, lack of knowledge on water rights ▪ **Commercial farmers**: Lack of water, lack of effective use of available infrastructure, allocation of land to wrong people, no transparency in water allocation, lack of state decision making on land and water, Lower and fluctuating products prices ▪ **NTK**- climatic changes, rainfall pattern is decreasing & often accompanied by storms and hail ▪ **Land Bank**- inadequate knowledge & infrastructure and equipment

Questions	Info needs	Answers provided
		▪ **DWAF**- inadequate water & cultivation of wrong crops ▪ **RESIS**- production method, knowledge, mechanization, access to credit, resources, markets
18. What are your perceptions about the future of crop production on these farms?	▪ Possibilities for crop production	▪ **All stakeholders**: possible if water problems are solved ▪ **DWAF**- long term crops, vegetables
20. What could be the issues that need to be considered in the future for profitable crop production and livestock production?	▪ determine strategies for commercial farming	▪ **LPDA**- water allocations and monitor water use by farmers, ensure correct land size for viable farming, soil analysis, produce for the market ▪ **LPDLA**- revitalize canal and infrastructure, commitment from farmers, assistance from CASP ▪ **Commercial farmers**- capacity building of farmers, financial support, production capital, long term guidance, redistribution of land to farmers not land owners ▪ **Farmers**: LPDA though BBMSC, must cooperate with DWAF to resolve water issues, must also investigate the capacity of the water because it is doubtful that it has limited capacity ▪ DWAF to ensure transparent water allocation procedure ▪ government must ensure that all farmers are farming or else redistribute the land

APPENDIX 7: STAKEHOLDER PERCEPTION MATRIX

Stakeholder	Perception on the problem situation	Perception on the Solutions / Opportunities
LPDA	Access to water Damaged infrastructure No interest to farm	Provision of water allocations Provision of feasible infrastructure Management of available water Extension services
DLA	Access to water Non-transparent water allocations and applications Shortage of water Boreholes not useable Poor infrastructure Financial assistance	Need market based production Access to more water Ownership of the land Technical support Provision of infrastructure Extension services
DWAF	Shortage of water Access to water Wrong crop production Power play between government departments No management skills	Provision of more water Redistribution of land to those with incentive to produce Skills training Long term guidance Better linkages between government departments Planting the right crops (oranges, vegetables, high-value crops) Partnerships between commercial and black farmers Extension services
Partnership: Production	Access to water Power play between government departments No financial management Theft of irrigation equipment High cost of living, due to many dependencies Some lack incentive to farm productively	Provision of more water Financial management training Long term guidance Better linkages between government departments Full time commitment by the farmers Partnerships Produce for the market
Partnership: Extra resources	Jealousy among the farmers – destructive Access to water No effective use of available infrastructure Wrong people were allocated land Non-transparent water allocation Power play between government department – decision making Land Claims No management skills	Vegetables under irrigation Dry land production Simpler irrigation methods / systems Irrigation from borehole water Enlarge dam's capacity Sell wood from bush clearing Resell non-utilized water quotas Long term guidance Redistribute land to relevant people Partnerships

Stakeholder	Perception on the problem situation	Perception on the Solutions / Opportunities
NTK	Erratic rainfall patterns and climatic changes Low prices for agricultural products Underutilization of available infrastructure	Access to more water Training Financial support Efficient extension services Shift from crop to Game farming and tourism Produce for the market
Land Bank	Poor infrastructure (fencing, irrigation equipment) Lack of management knowledge Insufficient extension services	Training in crop and livestock management Improve extension services Implement monitoring and support
Commercial farmers	Price fluctuations and uncertainties in farming Land claims Boreholes not efficient for irrigation Infrastructure have been damaged Lack of financing Lack of management skills	High intensive, high risk, high value crops Partnerships for long term guidance Allocate water to those who will utilise it Livestock is very feasible Need veld and grazing management Irrigation, only if they own land and water rights Need secured, committed markets
Supermarkets	Low supply of quality products Insufficient quantity of production	Produce in continuous supply Produce high quality products Partnerships Supermarkets can become more accessible for the local, small-scale producers
Marble Hall Fresh Produce Market	Low supply of high quality products Low supply of high value products Wrong crop production	Produce high quality products Produce high-value crops Collaboration in transport services Poultry production Planting the right crops
GPDA	Shortage of water – underestimated dam's capacity Conversion from crops to livestock farming Non-transparent water allocation	Access to more water Better linkages between government departments
RESIS	Unsettled Land claims RdW is not LPDA's priority to rehabilitate Ground water was very high fluoride content	Training Access to markets for high value crops Financial assistance Access to infrastructure Projects should be farmers' centred, not by extension services

Stakeholder	Perception on the problem situation	Perception on the Solutions / Opportunities
Farmers (Irrigation)	Access to water – too small quotas Land claims inhibit investments Low product prices	Larger quotas Land ownership Long term guidance Settled land claims issue Marketing/production contracts Partnerships
Farmers (Dry Land)	Access to water – can't get water allocations Non-transparent water allocation Financial constraints Poor fencing Roaming of neighbour's livestock Erratic rainfall patterns Lack of equipments and inputs Damaged infrastructure Lack of knowledge	Provision of water Transparency of water allocation process Revitalization of infrastructure Access to extension services Skills training Partnerships with commercial farmers Government support Effective farmers' organization
Farmers (Mixed)	Access to water Financial constraints Lack of knowledge Poor veld & grazing management Stock theft Animal diseases	Access to more water Fencing and veld management Skills training Veterinarian and animal health support services Contracts with departments for poultry production
Farmers (Subsistence)	Lack of resources Access to water Too small land Erratic rainfall patterns Financial constraints	Access to water and resources Training