

**Agrarian Systems Diagnosis and Cooperatives' support to a divergent typology of farmers.
The Case of the Riet River Irrigation Scheme.**

By

Makal Mwinkeu Papy

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DEDICATION

To my parents.

Mrs. Kachom Kadang Astride

and

Mr Mujing Mwinkyeu Nguz II Joseph

DECLARATION

I hereby declare that the research report hereby submitted is the true-type copy of the original work performed by, me, Makal Mwinkeu Papy, and that no such work or extract of such work has been used by or submitted to any third parties without the knowledge of the University of Pretoria.

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First of all, I am grateful to the Almighty God, who has blessed and guided me so that I am able to accomplish this dissertation.

On this very special occasion and I would like to express my sincere gratitude and appreciation to Dr Ward Anseeuw for supervising and giving me valuable time, advice, criticism and correction for the dissertation from the beginning to the end of the writing. I also want to thank Prof Johann Kirsten and Dr Joseph Benjamin Steven especially, and all the lecturers who have guided me during the years of my study at the University.

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I also place on record, my sense of gratitude to one and all who, directly or indirectly, have lent their helping hand in this venture.

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Department: Agricultural Economics, Extension and Rural Development

University: University of Pretoria

Degree: Master of Science: Agricultural Extension

Supervisor: Dr Ward Anseeuw

Co-supervisor: Dr Joseph Benjamin Stevens

ABSTRACT

This research study aims to create a better understanding of the diversity of the farmers of the Riet River Irrigation Scheme, situated on the border of Free State and Northern Cape provinces, as well as the role of Griqualand West Cooperatives (GWK Limited) with regard to the agricultural empowerment of these farmers. Extensive empirical work (50 preliminary interviews and 100 extensive in-depth questionnaires) formed the basis of an Agrarian Systems Diagnosis leading to the typology of 15 farm types:

- Type 1: Land reform beneficiaries with irrigation - SLAG programme (cattle, small stock, pigs: less engagement in irrigation);
- Type 2: Family beneficiaries of land reform with irrigation - PLAS programme (lucerne, maize, wheat, small stock);
- Type 3: Smallholder farmers rearing livestock on municipal land (cattle, small stock);
- Type 4: Women farmers rearing livestock on municipal land (cattle, small stock: commonage land);
- Type 5: Cereal (maize/wheat) farmers under pivot irrigation (lucerne, wheat, late maize, barley: privately owned land);
- Type 6: Lucerne producers with an extra agricultural activity linked to production (lucerne, maize : privately owned);
- Type 7: Small lucerne producers, pensioners or part-time farmers (lucerne, cattle: privately owned land);

- Type 8: Farmers adapting to the market with risk minimisation across cereal, lucerne and peanut production, as well as cattle fattening (peanuts, lucerne, maize, wheat, cattle: privately owned land);
- Type 9: Merino sheep (meat/wool) breeders recently installed (merino sheep, maize, lucerne: privately owned land);
- Type 10: Annual cereal (maize/wheat) farmers, also producing pecan nuts in pivot corners (pecans, oats, wheat, maize: privately owned land);
- Type 11: Dairy cattle farmers, in debt (dairy cattle, privately owned land);
- Type 12: Extensive livestock farmers with water rights, farming cereals on a large scale with silos (cattle, small stock, maize, wheat, lucerne: privately owned land);
- Type 13: Extensive livestock farmers with water rights, also producing potatoes and onions, engaged in “value adding” (cattle, lucerne, maize, wheat, onions, potatoes: privately owned land);
- Type 14: Part-time extensive livestock farmers (cattle, small stock: privately owned land); and
- Type 15: Game farmers (buffalo, golden oryx, brown springbok, white and black impala, etc.: privately owned land).

This study highlights the many differences among the Riet River farmers, as well as the differences in the constraints they endure, including major differences in productivity (with types 1, 2, 3, 4, 7 and 14 experiencing very low levels of productivity); lack of access to new water rights (with types 5, 6, 8, 9, 10, 11, 12, 13 and 15 being mainly affected); difficulty in accessing farming services (including lack of access to credit, inputs and product marketing services); insecure property rights (with types 1, 2, 3, 4, 7 and 14 being affected most due to their lack of collateral security to access the necessary services); poor infrastructure (for types 1, 2, 3, 4, 7 and 14 especially); low farming income (primarily for types 2, 3, 4, 7 and 14); as well as high irrigation costs, lack of fertile land of good quality, and lack of financial and technical support (mainly affecting types 1, 2, 3 and 4).

GWK Limited offers a range of farming services aimed at alleviating some of the aforementioned issues. This being said, different farmers in the region are being reached and supported through these services in highly different ways. As such, the assistance provided by GWK Limited is focused mainly on improving the farming activities of a specific group of farmers (55 %) engaged in important forms of production and with high productivity rates - mostly farmers of types 5, 8, 9, 10, 12 and 13. This means that farmers of types 1, 2, 3, 4, 7 and 14, with insecure land-tenure rights, small plots of land and low production and productivity rates, are not fully benefiting from these services. For example, the company has been hesitant to provide credit to these farmers owing to the high risk associated with loans to this category of farmers. Such risk can be attributed to insufficient or absent collateral (owing to poorly defined tenure rights and low levels of capital),

poor financial recordkeeping, and high transaction costs involved in granting small production loans. Moreover, the technical support and production practices offered to these farmers are of poor quality or non-existent, as the company's services are focused primarily on farming for purposes of profitmaking. Despite having an Emerging Farmers Division under its management, GWK Limited is typically not interested in small-scale farmers.

This research study relating to agrarian systems typology contributes to the understanding of the diversity of South Africa's agriculture, farmers' livelihood strategies, and the extent to which agriculture contributes to household income. The study is also aimed at better analysing the farming system trajectories and agrarian changes in South Africa, so as to develop divergent policy recommendations for South African agriculture. In addition, the study contributes to a better understanding of which services are (or are not) reaching which types of farmers, and as such, it enables a readjustment of service provision aimed at broad-based agricultural development in South Africa.

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ACRONYMS AND ABBREVIATIONS

AFASA	African Farmers Association of South Africa
AFD	Agence Française de Développement (French Development Agency)
ARC	Agricultural Research Council
AV	Added Value
CLaRA	Communal Land Rights Act
CPA	Community Property Association
DLA	Department of Land Affairs
DTI	Department of Trade and Industry
FAO	Food Agricultural Organization
GCIS	Government Communication and Information System
GIS	Geographic Information System
GWK	Griqualand West Cooperative
ICA	International Cooperative Alliance
IDC	Industrial Development Corporation
IDC	Industrial Development Corporation
LRAD	Land Redistribution for Agricultural Development
NAV	Net Added Value
NCBA	National Cooperative Business Association
NCFC	National Council of Farmer Cooperatives
NGCs	New Generation Cooperatives
NGO	Non-Governmental Organization
ORWUA	Orange Riet Water User Association
PLAS	Proactive Land Acquisition Strategy
RoA	Department of Agriculture
SEDA	Small Enterprise Development Agency
SLAG	Settlement Land Acquisition Grants
SMMEs	Small, Medium and Micro Enterprises
SPSS	Statistical Package for the Social Science
SSA	Statistics South Africa
USDA	United States Department of Agriculture

CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 BACKGROUND

South African agriculture is very diverse. This diversity comprises a large number of different types of agricultural activities, with at the extremes large scale commercial farms' sector on private own land that coexists with smallholder and emerging farms on communal or redistributed land.

The commercial farmers practise their farming activities on privately owned land. These commercial farms contribute 95 % of South Africa's total agricultural production (World Bank, 1994) and assure the country's sufficiency for most of the agricultural products. They employ between 750 000 and 1 000 000 farm workers (Statistics South Africa (SSA), 2000). On the other hand, 14 million black people, gathered on the former Bantustans and reserves, share 13 % of South Africa's land area (Department of Agriculture, 1995). The large majority of these people are engaged in one way or another in small-scale farming activities, mainly for their own consumption. Their farming production only represents 16 % of their food needs (Anseeuw, 2004).

The colonial period was characterized by attempts by the state to develop a class of commercially viable small-holder farmers. In southern Africa, however, these efforts were largely unsuccessful. Early peasant successes that threatened to compete with emerging white commercial farmers were snuffed out (Phimister, 1988; Bundy, 1979). For the most part, the native reserves continued to function as areas supplying labour to dominant capitalist sectors, such as mining and industry, as they were originally designed to do, with peasant agriculture providing a supplement to wages and remittances and thus subsidizing low wage levels (Wolpe, 1972; Palmer & Parsons, 1977).

At the end of apartheid, around 82 million hectares of commercial farmland (86 % of all farmland, or 68 % of the total surface area) were controlled by a white minority (10.9 % of the population), and that land was under the total control of approximately 60 000 owners. More than thirteen million black people, the majority of them poverty stricken, remained crowded into the former homelands, where tenure rights to land were generally not well defined or contested and the system of land administration was in disarray. These areas were characterized by extremely low incomes and high rates of infant mortality, malnutrition and illiteracy, relative to the rest of the country. On private farms, millions of workers, former workers and their families faced severe

tenure insecurity and lack of basic facilities. Today, South Africa has one of the most unequal distributions of income in the world, with income and quality of life being strongly correlated with race, location and gender (May, 2000).

Inevitably, a key issue for newly-elected democratic governments in South Africa was whether or not to alter fundamentally the agrarian structure through a large-scale and rapid redistribution of productive land. For a variety of reasons, including doubts about the productive capacity of small-scale producers, this was deemed not feasible. Instead, policies set out to reform the agrarian structure more gradually, through removing racial barriers to ownership and encouraging the de-racialization of commercial farming, and through versions of market-based land reform. These policies were premised on a particular view of viability and centred on preserving the productive capacity of the large-scale farming sector, while at the same time promoting the growth of small-scale commercial farming, both in communal areas and on redistributed land (Cousins & Scoones, 2010).

About 13 % of the farming households occasionally commercialized part of their production (World Bank, 1994). Only 0.2 % of these households could effectively live of it. Furthermore, it was estimated that one-third of the rural households had no access to land (Anseeuw, 2004).

Households that had access to land practised certain farming systems that occurred within diverse biophysical and socio-economic environments. Rural families develop different livelihood strategies, driven by opportunities and constraints encountered in such environments. Agro-ecology, markets and local cultures determine different land use patterns and agricultural management practices across the region (Crowley & Carter, 2000).

Recognizing variability within and among farms and across localities is the first step in the design of policies to help poor farmers, and a key one with regard to the adoptability and performance of new technologies proposed to improve agricultural production. An improved understanding of the main drivers of household diversity and the ability to categorize patterns of diversity that bear a relationship with livelihood strategies and farming objectives, should help to better target agricultural innovation (Ruben & Pender, 2004).

Owing to the poor record of government in delivering and providing support services to land reform beneficiaries and black farmers entering the commercial farm economy, there is a real duty for the cooperatives sector to help. It does not make sense for the Department of Agriculture and its agencies, such as the Land bank, IDC, ARC, etc., to continuously design new and parallel systems

when there already exists a useful and well-endowed network of delivery points and depots across the country. It is, therefore, critical to show the extent to which black farmers are already being supported by the private sector network in South Africa and then to argue how the existing system and services can be up-scaled to reach more aspirant farmers (Kirsten & van Rooyen, 2008).

The Strategic Plan of South African Agriculture raised several questions regarding the extent to which the private sector, and specifically the cooperatives sector has contributed to the transformation in the agricultural sector, to the increased participation of black farmers in the mainstream agricultural economy, and to the general process of increasing black ownership of these firms (Kirsten & van Rooyen, 2008).

1.2 PROBLEM STATEMENT

In rural areas, smallholder farmers only derive a rudimentary proportion of their livelihoods directly from farming activities; non-farming sources, such as remittances, off-farm work, and government transfers, have all been gradually strengthened in light of the demise of agriculture that is of heterogeneous nature. This diversity can be realized by identifying different farming systems typology to enable smallholder farmers to produce commercially in those regions where the smallholder farmers experience unequal land reform, lack of collateral to access financial and technical support compared to large-scale farmers. Thus, smallholders' farmers and land reform beneficiaries farmers' agriculture is not accomplishing the fundamental role it should be playing in a developing country like South Africa. These farmers have long been ignored for many reasons, but are in fact more productive than larger units and absorb far more labour. Not only can they be the engine for development in most countries where they are the norm, but their development as economic units will also bring real human development benefits to the majority of people in the countries concerned (Binswanger, 1994).

The greater part of the activities of disadvantaged farmers is under-represented in the agricultural mainstream as they practise their farming activities on commonages or redistributed land. This kind of farming is characterized by low production, poor access to land, poor access to inputs and, most importantly, by limited access to credit. Access to affordable credit is one of the most important factors affecting production and, therefore, income for the poor.

The poor access to agrarian and support services is attributed to socio-economic factors of the farmers, as well as the constraints encountered by these farmers in dealing with institutions. Constraints encountered by the financial institutions in serving small-scale farmers and the poor

involve high risk and high transaction costs (Okurut, Schoombee & Van der Berg, 2004; Spio, 2002). Although government has made some advances in broadening the access to credit, most smallholder farmers and land reform beneficiaries still do not have access to affordable credit for investment in the technology imperative for expanding and intensifying agricultural production or diversification of production into high value crops (Vink, 2003).

Since the conversion of GWK into a private company for profit purposes, it has been criticized for poor service delivery and not working with smallholder farmers and land reform beneficiaries because of the lack of collateral security. There is a need to evaluate its contribution to the empowerment of smallholder farmers and land reform beneficiaries in the diversification of those of their farm activities which are considered to be less productive in the Riet River Irrigation Scheme.

The exploitation at farm level cannot be understood without knowing the mode of exploitation of each plot and herd composing the farm. The district of the Riet River Irrigation Scheme and its dry land is composed of different rural areas (Jacobsdal, Modder River and Richie), which present a great diversity of agricultural situations. Therefore, making a single proposal for intervention in the whole region, or providing too many proposals that could be difficult to implement, would be disastrous without understanding the farming realities in the region.

It is necessary to identify a limited number of zones with different agricultural situations, and to understand the main characteristics of their evolution. It is informative to gain an understanding of the main ecological and socio-economic characteristics and the main associated modes of natural resource exploitation. Available ecological and socio-economic data in occurrence topographic, geological, soil or vegetation maps, climatic data, survey data, various statistics, population density, and main infrastructure can all be very useful in formulating a hypothesis to explain agricultural differences (Sacklokham & Baudran, 2005).

Farming systems in the semi-arid area of Northern Cape and Free State are still not well understood. Thus, the land mode of operation of farmers is still not yet identified. The description and analysis of the farming systems in the region can bring about a clear reflection regarding agrarian change. Without such identification of farms diversity, difficulty would remain for policy makers in addressing the appropriate policy options that might stimulate sustained productivity and contribute to the economic development of farmers in the region.

1.3 PURPOSE STATEMENT

The main purpose of this study is to understand the diversity of South Africa's agriculture, farmers' livelihood strategies and the extent to which agriculture contributes to a household's income. It is also intended to obtain a better analysis of farming systems trajectories and agrarian changes in South Africa, so as to develop policy recommendations to South African agriculture. Furthermore, this research analyses the role of GWK (Griqualand West Cooperative) in poverty alleviation and agricultural empowerment of farmers in the region.

1.4 RESEARCH OBJECTIVES

The study will aim to achieve the following specific research objectives:

1. A better understanding of the diversity of South African agriculture through the:
 - Identification of different farming systems in specific region,
 - In-depth analysis of each farming system and their relations,
 - Understanding the role of agriculture within the livelihood systems.

2. An in-depth reflection regarding agrarian change in South Africa and policy implications through the:
 - Description of farming systems trajectories,
 - Broader reflection on agrarian changes in the region,

3. A better understanding of the role of GWK (Griqualand West Cooperative) through the:
 - Assessing of its contribution in each farming system type.

1.5 HYPOTHESIS TO BE TESTED

Farmers' farming systems are diverse, dynamic and complex, and are directed in a manner in which they view farming and involve agricultural practices of their choice.

1.6 ACADEMIC VALUE AND CONTRIBUTION OF THE PROPOSED STUDY

This proposed study will contribute to the academic literature on the process of agrarian diagnosis of the Riet River Irrigation Scheme and its dry land. It describes the diversity of farms' situations, highlighted in the area with the description of each spatial unit, and explains variables that will be identified to describe the diversity and the spatial distribution of farming system situations.

Research shows that smallholder producers are often highly productive and make a valuable contribution to the economy. For this reason, the study will examine the agricultural diversity of the Riet River Irrigation Scheme and its dry land, as well as the role of agriculture within the households 'livelihoods by providing a heterogeneity representation of farming systems in the Free State and Northern Cape regions.

The study provides for the reader concrete reflection of agrarian change and farming system trajectories in South Africa and makes tangible policy recommendations for South Africa's land and agrarian changes. It provides a methodology for understanding the diversity and the complexity of agricultural practices. The study expounds on the research and provides a planning tool that allows us to understand each form of agriculture and to roughly establish the characteristics of the historical transformations and geographical differentiations of a rural society. This helps when defining appropriate policies, strategies, programmes and projects that are related to poverty or resource management.

It describes and summarizes experiences in developing and applying a holistic approach to land tenure dynamics in rural areas. It also presents both the conceptual elements and practical methodological proposals for operationalizing agrarian systems diagnosis. It clearly shows the comprehensiveness of the role of GWK (Griqualand West Cooperative) agribusiness cooperative in terms of agricultural empowerment, as it plays a pivotal role in the production and marketing of farmers' output in the region.

1.7 DELIMITATIONS

The research focuses on the Riet River Irrigation Scheme and its dry land for the agrarian system diagnosis purposes, covering both agricultural areas in Northern Cape and Free State. It concentrates on all farming types identified in the region. Although it presents an in-depth analysis of the farmers present in the area, it can be generalised to South Africa's situation.

The research comprises an in-depth analysis of each farming system and an examination the role of agriculture within the livelihood systems. The study focuses on describing all the farming systems trajectories, and gives a wide reflection on agrarian change in South Africa for policy development.

The study does analyse the non-farm households and does not take them into account when examining livelihood realities. Only farming households were surveyed. Finally, Agrarian System Diagnosis does not offer a development strategy, but only a set of procedures aiming at the improvement of the standard of living of the target groups and focuses on the contribution of cooperatives (especially GWK) in South Africa's agricultural empowerment of farmers.

1.8 ASSUMPTIONS

The study focuses on analysing the agrarian system as a complex, interrelated matrix and not as a disconnected element. It focuses also on the dynamics and strategies of the farm household as this is the investigation unit and sets its attention on dynamics and interactions between types, including socio-economic and political dimensions.

The agrarian system diagnosis approach provides powerful insights into the process of agricultural development at grassroots level. It offers further contribution, from the land tenure viewpoint, to the realization of genuine, sustainable development. Unless a suitably wide range of farm household systems are studied, programmes may be developed on the basis of a typical stereotype. Thus, the situation from the viewpoint of the farmer needs to be supplemented by an analysis from the wider viewpoint of economic efficiency, in order to develop a complete overview and offer a more immediately comprehensible and intuitive picture of sector problems and opportunities. Moreover, it has the advantage that the conclusions and ideas developed have been endorsed by what should be a representative segment of the farm population. The different services of GWK which provide support to emerging farmers will be analysed in this research in terms of the agricultural empowerment of smallholder farmers and land reform beneficiaries.

1.9 DEFINITION OF KEY TERMS

The study involves a number of key terms namely, agrarian system diagnosis, small-holder farmer, small-scale farmer and large-scale farmers, cooperative, farm household unit, typology and zoning.

1.9.1 Agrarian System diagnosis

An agrarian system can be defined as the way farmers exploit the environment by using the relations and interactions that occur between all of its social and physical components. The system also takes into account the limits of the environment and its ability to reproduce (Sacklokham & Baudran, 2005). It is a mode of exploiting the environment historically created and sustainable, a system of production forces adapted to the bioclimatic conditions, given space and responsive to the social conditions and needs of that moment (Mazoyer, 1987). The Agrarian Systems Diagnosis gives, as well, a specific role to those systems which are "goal-orientated", such as the production system managed by a farmer according to his or her own purposes, and taking into consideration his or her constraints and opportunities.

1.9.2 Farm household unit

A farm household unit provides a good framework for addressing human development concerns. This study seeks to understand interactions between the different components of the overall environment as they affect the decisions and performance of each farm household. It also directly confronts the difficulties of reconciling governmental objectives with individuals' priorities (United Nations, 1999).

The FAO (1989) has defined the farm household system as three sub-systems (habitat, production and consumption) which are interlinked and interactive:

- Habitat (those who live together): a decision-making unit; establishing general goals for the system.
- Production (those who work together): other decision-making unit; establishing technical goals for the systems.
- Consumption (those who eat together): other decision-making unit.

1.9.3 Small-scale and large-scale farmers

A small-scale farmer is one whose scale of operation is too small to attract the provision of the services he or she needs to be able to significantly increase his or her productivity. Small-scale farming is always considered in South Africa as being a type of backward, non-productive, non-commercial, subsistence agriculture that we find in parts of the former homeland areas. It is generally associated with black farmers, as if black farmers do not have the ability to become

large-scale commercial farmers. On the other hand, white farmers are generally perceived to be large scale commercial farmers, who are modern and efficient, using advanced technology. These generalizations are a misrepresentation of the facts. The size of the scale should not be considered to be a criterion of defining small- or large-scale farming, but rather their production capacity should be (Kirsten & van Zyl, 1998).

1.9.4 Smallholder farmers

Authors have defined the term “smallholders” in different ways. Some have focused on their lack of land tenure, others have pointed to the productivity levels, while others have pointed to the limited resource levels of the sector. Smallholders are constituted around the household in their management of production resources and organization of consumption (Netting, 1993).

1.9.5 Emerging farmers

In South Africa, the term “emerging farmers” is seen as referring to farmers who have acquired a few livestock and practise crop production and are intent on expanding their stock or crop, but who have not yet reached the level of being self-sufficient in terms of capital and livestock or crop assets. Their aim, however, is to increase their production (Benseler, 2003).

1.9.6 Cooperative

The International Cooperative Alliance (ICA) defines a cooperative as “an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise”. (ICA, 2005).

1.9.7 Typology

The word “typology” can be considered as describing an attempt to highlight the diversity of livelihoods systems. It is an endeavour to group activity units according to their main modes of operation and their common characteristics. Within the framework of rural development, a typology will involve grouping and then describing households with similar needs, with regard to a project’s objectives (Anseeuw, 2011).

It can be also defined as a procedure (qualitative or quantitative) for developing and describing relatively homogenous groups of households or communities who face more or less similar constraints or incentives, and who are hence expected to be affected by external influence similarly (Perret,1999).

1.9.8 Zoning

The word “Zoning” refers to the geographical delineation (mapping) of spatial units presenting an acceptable degree of homogeneity, according to some relevant criteria (Anseeuw, 2011).

1.10 STUDY OUTLINE

The first chapter constitutes the introduction to the research project, which includes the background, problem statement, purpose statement, research objectives, academic value and contribution of the proposed study, delimitations, assumptions, definition of key terms and hypothesis to be tested. The second chapter sets out a literature review on agrarian systems and smallholder farmers, smallholder farmers’ livelihood diversification, agricultural empowerment of smallholder farmers, land reform, and cooperatives conversion (case of GWK) in order to engender a theoretical perception of the subject. Chapter three presents the methodology, research area definition (description of the Riet River Irrigation Scheme and its dry land) and the analytical methods used to identify and validate the data collected, i.e. typology analysis. Chapter four presents the results and discussion of the study. Finally, Chapter five presents the conclusion and recommendations of the study.

CHAPTER 2

LITERATURE REVIEW

This chapter presents the literature review, from a worldwide observation, followed by African and South African perspectives of agrarian systems diagnosis and smallholder farmers. This chapter also tabulates the socioeconomic situation, livelihood diversification and agricultural empowerment of smallholder farmers in South Africa. It focuses, as well, on the obstacles faced by smallholders for expansion, the land reform in the former homelands, and the financial implications. The production potential of smallholder farmers will be also discussed in this chapter, followed by the cooperative's perception in terms of agricultural empowerment of smallholder farmers in South Africa. This chapter culminates in a conclusion.

2.1 AGRARIAN SYSTEMS AND SMALLHOLDER FARMERS: WORLDWIDE PERSPECTIVE

The experimental evidence all over the world supports the view that there is hardly a landscape anywhere that is not covered by access or use rights of some sort. As power relations between distinct social groups have evolved, less visible social rights have been transformed into more private or exclusive forms of land access, conditioning the relative wealth and wellbeing of those on either side of the fence. Elites with new economic ambitions may exert their authority over land once used commercially. England, for example, has managed to transform peasant or sharecropper agriculture into more extensive, commercially-focused enterprises. Landlord estates may subsequently continue to have their entire area cultivated by other users (tenants) but under contracts with specific commercial terms. Tenants may not necessarily suffer in the process, provided that their contract with the landlord is legally enforceable and allows for some autonomy (for example, present day tenant farmers in England). In contrast, Latin American "haciendas" parcel out land to workers who cultivate family plots for subsistence and provide paid or unpaid labour services to the owner. The relations governing access to land are highly exploitative and allow few opportunities to experiment with new crops or accumulate wealth. Large plantations also function on the basis of grossly exploitative conditions, such as slavery or later forms of forced or indentured labour. In India, particularly since the advent of the 'Green Revolution', many thousands of smallholders and sharecroppers have lost individual land rights granted by private landlords. Weak legal protection and a vastly inferior socio-economic position left them defenceless against landlords wanting to consolidate tiny production units into larger and more capital-intensive commercial enterprises. Owner-operated family farms have become common across Western Europe and still predominate in France and most Mediterranean countries. Yet in England, the

small family farm and farm tenancies are becoming less common, as large corporations buy up land and contract professional, salaried farm managers to run them. Private and communal forms of land use still exist side by side, with areas of common land used for grazing and public leisure activities. Membership of service cooperatives for processing and marketing farm goods offers small farms some of the economies of scale enjoyed by larger units, while remaining large landlord estates are farmed either directly by their owners, or by tenant farmers. There are also large public or state land holdings which are used for a variety of purposes, such as National Parks, and other publicly controlled landholding institutions which own and manage land assets in the name of conservations (Paolo, Christopher & Michel, 1999).

While different land access systems often coexist at the same time in the same area, and are sometimes even complementary, the same can be said for production systems. Together, they meet a wide range of needs that one system alone could not satisfy.

The Food and Agriculture Organization of the United Nations has described the evolution of farming systems as follows:

Historically, the emergence of new farming methods in response to the need of growing populations for more food did not supplant existing systems of food production. Thus, the early hunter and shepherd stage survives in the desert nomads and modern range farmers of today. The succeeding planting stage, with tree-protected shifting cultivation, persists unchanged in many tropical rains fed areas; it has also developed into horticulture and market gardening in semiarid and temperate zones. The last stage, field crop farming, developed ultimately as highly specialized, uniform crop farming on large areas with powered machinery and chemical methods and has not displaced either of the earlier methods of production. Each stage came into existence to meet new demands. At the same time, the older ones continued to develop. Agriculture is so diversified and so flexible by nature that abundant production can be secured from a variety of systems (FAO, 1969).

2.2 AGRARIAN SYSTEMS AND SMALLHOLDER FARMERS: AFRICAN PERSPECTIVE

Many of the land access systems still exist under the label of 'traditional land rights' in Africa, and are often mistakenly seen as some form of primitive communism where land and natural resources are collectively owned. The idea of gaining access to, and the right to use, specific resources has led to the development of many complex rules and conventions between different socio-economic groups and sub-groups. These can either be quite separate ethnic groups who use different part of

the same landscape, such as the balanta rice growers and the Manjaco upland cereals and palm oil producers in Guinea Bissau, or they can be sub-groups of the same society with unequal or controlled forms of access to the resources around them.

Other ecological and historical contexts give rise to long-standing agreements over shared use, such as long distance cattle grazing across land belonging to neighbouring communities, or the communal use of specific resources, such as lakes and forests. In many countries the State has intervened through agrarian reform policies where the population has apparently suffered through exploitative private land rights and grossly unequal access to land and other natural resources. New forms of land access have appeared: state farms, collective farms (cooperatives), and specific agrarian reform titles for individual farmers. In many cases, however, access to land through agrarian reform distribution has led to restricted property rights, even when individual land access has been allowed (e.g. the sale of the land is prohibited for a long period after rights are attributed).

Even where strong private rights exist, it is possible to find several distinctive types of land access. In general, once private appropriation of land has been established as the norm, landless rural producers have still been able to get access to land through a range of contracts with land owners (including the State). These include share contracts or share-cropping (paying a certain percentage of production, or crop share, to the owner) and tenancy contracts (paying a fixed amount in cash or in kind or in labour). There are also innumerable formal and informal arrangements which involve some form of rent or the exchange of services and goods. In addition, all contracts can cover either short or long periods, and can include restrictions on what is done (planting trees, for example, is often prohibited in Africa, where trees are seen as a sign of permanent occupation and *de facto* ownership) (Paolo et al., 1999).

2.3 AGRARIAN SYSTEMS AND SMALLHOLDER FARMERS IN SOUTH AFRICA

The agricultural sector in South Africa is characterized by heterogeneity, with large-scale commercial farmers, subsistence, and smallholder sectors coexisting side-by-side, practising varying types of agriculture. One part comprises large-resourced farms, mainly owned by white farmers and this sector contributes to the whole value of agricultural production in the country. The other part comprises resource-poor, small-holder and subsistence farms owned and operated mainly by black farmers who produce mainly for subsistence purposes and who lack institutional support. The sector is afflicted by all the vagaries of poverty, food insecurity, and lack of employment (Mudhara, 2010). They operate complex systems, typified by a variety of activities undertaken at the same time, to fulfil their livelihood requirements. Resources are allocated across

different options to maximize a household's utility function, subject to varied constraints (Becker, 1965).

The current reality of agriculture in the former homelands of South Africa is a depressing situation characterized by widespread abandonment of land. Accordingly, smallholder agriculture is not fulfilling the pivotal role it should be playing in developing rural areas and the country at large. Indeed, some authors have started to question whether smallholder agriculture can play any role in the South African economic development process. Commercial agriculture, underpinned by the “emerging farming sector”, is the preferred model as it is adjudged to bring several benefits, chief among which is employment creation on the farms, national food security, accompanied with affordable food prices (Mudhara, 2010).

In several rural areas previously classified as non-white, the agricultural activities of the pluri-active farmers have recently been limited in order to control the problems of overgrazed communal pastures. Those who are not originally from rural areas, and also those who are but who had not been farmers before, have since been prohibited from access to the communal lands. These recent limitations will inhibit the farm development possibilities for those who have the means to do so. In addition to the fact of not having the capacities to acquire private lands, potential commercial farmers are now excluded partly from the communal lands and certain services in relation to agricultural development (Anseeuw, 2005).

2.4 SOCIO-ECONOMIC SITUATION OF SMALLHOLDER FARMERS

A large proportion of South Africa's population reside in rural areas and are, one way or the other, involved in some agriculture-related activity. Agriculture employs 4.75 million people, of whom 4 million are engaged in agriculture for “own consumption” purposes. Hence, the non-agricultural sectors formally employ 8 million employees, which means that those who grow their own food, i.e. the smallholders, “employ” or have the potential to employ approximately 33 % of the total labour force in the country; bringing the smallholder farmers into the mainstream of economic activities lies at the core of realizing the development approaches that are desired by government (Cousins, 2009).

Most farming households are still characterized by poverty, hunger, poor remuneration, and underemployment, as well as unemployment. Rural areas continue to lack economic activities close to communities. Limited access to employment opportunities further limits the potential of

most rural communities to create and sustain economic growth. As a result, there are frequent incidents of social strife and crime (Mudhara, 2010).

Netting (1993) describes smallholders through a number of key characteristics, as follows:

- Rural activities practising intense, permanent, diversified agriculture on relatively small farms in areas of dense population;
- The family household is the major corporate social unit for mobilizing agricultural labour, managing productive resources and organizing consumption;
- The household produces both for consumption and for the market and undertakes cottage industry or other off-farm employment.

Netting (1993) and Timmer, Falcon and Pearson (1983) argue that the farm household is also the level at which the psycho-sociological, agro-economic and agro-ecological disciplines interact most profoundly. Therefore, most development concerned with smallholder farmers focuses on the household level. Cousins (2009) describes three features of smallholders that coincide with that of Netting (1993). He demonstrates that farming constitutes only a partial contribution to the social production of smallholders; farming meets most of their social production requirements and farming produces a considerable surplus, providing profits to be reinvested and, for some, allocates capital accumulation in agriculture to begin.

Netting (1993) and Cousins (2009) observed in the same perspective that smallholders need cash income to purchase many other goods for purposes of both production and consumption. Cash income can be obtained from selling farm products, and in case of scarcity, household members ventured into other activities as a supplement to farming, such as wage labour and small trading. Thus, agricultural production is the pillar of smallholder livelihoods and should not be considered as a replacement for other activities that might occur. Smallholder farmers have diverse objectives. They may seek to increase cash for buying consumer goods and to achieve greater food security which may simultaneously offer the potential to reduce the amount of family labour time used in farm work. Some of the objectives are complementary, while others are competitive.

Smallholders typically cannot afford to purchase a truck and enter the long-haul transport niche of the food marketing channel, no matter how profitable it might be (Barrett, 1997). On the other hand, if non-farm or off-farm options can be accessed easily, and credit markets are thin or missing, non-farm earnings can be a crucial means for overcoming working capital constraints and

facilitate the purchasing of necessary variable inputs for farming (e.g. fertilizer, seeds, equipment, and labour) or making capital improvements (e.g. bunds, ridges and irrigation) to one's farm (Reardon, Crawford & Kelly, 1994; Savadogo, Reardon & Pietola, 1998; Reardon, Barret, Kelly & Savadogo, 1999). Similarly, where credit may be available but the land is unacceptable as collateral, the evidence of steady off-farm cash income may suffice to enable one to borrow. Relatedly, some farmers may feel a deep attachment to agriculture as a way of life and are willing to pay, in the form of foregone profits, to maintain the family farm. In the presence of working capital constraints, off-farm earnings may be essential to maintaining a viable farm that requires purchased inputs or that cannot generate enough cash income to satisfy the household's cash requirements (for taxes, consumption goods purchases, school fees, medicines, etc.). In the absence of complete credit or insurance markets, individuals are typically unable to moderate consumption in spite of a strong desire to do so. When financial markets (for credit and insurance, in particular) are complete, economic theory suggests that individuals consume only the permanent portion of their income and save any transitory positive (negative) earnings. Alternatively, if they are risk averse, they purchase insurance to relieve themselves of income risk (Barrett, Reardon & Webb, 2001).

In the same way, the concept of self-insurance is an *ex ante* concept of risk mitigation. If, as is widely believed, risk aversion is decreasing in income and wealth, then the poor will exhibit greater demand for diversification for the purpose of risk mitigation than the wealthy do. The fact that diversification rises with wealth or income in both absolute and proportional terms in rural Africa emphasizes that the point that risk mitigation cannot satisfactorily explain the observed patterns of non-farm activity (Reardon, Webb & Barret, 1998).

Economies of scope exist when the same inputs generate greater per-unit profits when spread across multiple outputs than when dedicated to any one output. The concept differs from that of economies of scale, in which per unit profits increase as the amount of all inputs to production grows. Economies of scale tend to favour specialization. Most empirical studies of African agriculture find no significant economies of scale beyond a very small farm size, attributable in great part to the absence of sophisticated water control or mechanization. In this setting, there is little pressure to concentrate production in a single crop (Barrett *et al.*, 2001).

2.5 SMALLHOLDER FARMERS' LIVELIHOOD DIVERSIFICATION

Diversification is a principal means by which many individuals reduce risk and is widely understood as a form of self-insurance by people exchange some foregone expected earnings for reduced

income variability, achieved by selecting a portfolio of assets and activities that have a low or negative correlation of incomes (Alderman & Paxson, 1992).

Crop diversification by smallholder farmers is a widely-advocated means for agricultural and rural development. Crop diversification implies a shift from single crop farming to multiple crop farming, from subsistence to commercial farming, or from low value food crops to high value food and non-food crops. The level of diversification largely depends upon the agro-climatic or socio-economic conditions and the technological development in the region (Pattanayak & Nayak, 2005).

Diversification is considered to reap scale economies arising from complementary and supplementary enterprises. Diversification of crops also generates more employment as the farmers and agricultural workers remain busy in sowing, weeding, harvesting and marketing. As farms get smaller owing to land segmentation, it becomes increasingly important to develop strategies that increase productivity, both for the labour as well as the land. Otherwise, smallholder farmers will simply be working harder and harder to achieve the same level of per capita income, or even less. In order to maintain or increase their incomes, it is important that smallholder farmers diversify beyond traditional crop production into profitable activities that are compatible with the diminishing land/labour ratios. Farm diversification is a way of branching out from traditional farming activities and for taking on a new income-generating enterprise. Diversification, in for instance horticulture or livestock enterprises, typically gives high returns per unit of land and is labour-intensive, and hence well suited to small farm conditions (Hazell & Haddad, 2001).

A related, but distinct, role of diversification is to cope ex post with shocks to income. When crops fail or livestock die, households must reallocate labour to other pursuits, whether formal employment off-farm (e.g. wage labour), informal employment off-farm (e.g. hunting), or non-agricultural activities on-farm (e.g. weaving and brewing) (Barrett et al., 2001). Rising per capita incomes are also associated with expanding rural non-farm economies, which offer opportunities for smallholder farm families to diversify into non-farm employment or into non-farm businesses. Diversification has been advocated as a useful strategy to buffer the effects of unpredictable variations (Heady, 1952). Specific conventional objectives of diversification usually include risk reduction, realization of economies of scope, reducing variability of income, preventing net income falling below some minimum level, and increasing the ability of the farm enterprise to withstand unfavourable conditions (Barret & Reardon, 2000; Harsh, Connor & Schwab, 1981).

With increasing rural populations but scarce land, small farms may eventually become too small and fragmented to be efficient. It has been shown that profits per hectare decline when farms get

too small (Carter & Wiebe, 1990). It is likely that small farms first lose their competitive advantage for growing food grains, rather than for labour-intensive livestock and horticultural products. Diversification from farming may have some negative repercussions for sustainable intensification and natural resource conservation. Low (1986) claims that employment opportunities in the mining sector in South Africa attract quality labour from rural areas to the detriment of sustainable intensification of small farms.

One implication of the “diversification as risk management” rationale is that the need for self-insurance is a meaning of the availability of substitute social insurance, provided through transfers by the government, by non-profit agencies, and by community or family members. Since social insurance can at least partly substitute for self-insurance, one would expect greater need for asset, activity, and income diversification where social insurance is relatively scarce (Barrett et al., 2001).

Whereas diversification is a natural response to substantial climatic risk and transactions costs in lower potential agricultural areas, the evidence largely finds non-farm activity highest in areas of better-than-average agricultural productivity and incomes, underscoring the importance of familiar intersectional linkages (Hagglblade, Hazell & Brown, 1989; Reardon, 1997).

Ellis (1992) argues that the availability of multiple objectives means that smallholder farmers do not have a single response to changes in economic stimuli. For example, when there is a change in market conditions such as prices, the response is more than merely maximizing cash income, rather it is blended with other objectives. The heterogeneity, autonomy and self-determination of farmers also render their responses to similar stimuli as heterogeneous (Netting, 1993).

By the same token, smallholder households endowed with much labour, but relatively little land, will, in the absence of well-functioning land markets, typically apply some labour to their own farm, and hire some labour out for off-farm wage employment in agriculture. Because individual factors of production face diminishing returns in most productive activities, when individuals or households are not endowed with the ratio that maximizes profits at prevailing shadow prices, and there are not well-developed asset markets through which they can exchange assets to achieve the optimal mix, diversification becomes the natural response. Individuals rationally allocate assets across activities to equalize marginal returns in the face of quasi-fixed complementary assets (e.g. land) or mobility barriers to expansion of existing (farm or non-farm) enterprises. For the poorest, this typically means highly diversified portfolios with low marginal returns, or desperation-led diversification (Barrett, 1997; Reardon, Taylor, Stamoulis, Lanjouw & Balisacan, 2000; Little, Smith, Barbara, Cellarius, Coppock & Barrett, 2001).

2.6 AGRICULTURAL EMPOWERMENT OF SMALLHOLDER FARMERS

The Natives Land Act, No 27 of 1913, was the first concerted legislative attempt at the forced removal of black farmers from their land. It limited them to native reserves, which at that time covered 8 per cent of the total land area. The political and economic objective of the “reserve” policy was to maintain labour reserves, in which a degree of food self-sufficiency could be retained, with households depending on migrant remittances for supplementary cash income. In its place, non-agricultural sources, such as remittances, off-farm work, and government transfers, have all become gradually strengthened in light of the demise of agriculture. The activities of smallholder farmers depend on the household objectives, the number of resources they are undertaking, the set objectives and the entitlements they can draw upon. Decisions are taken under limited resource endowments (e.g. land, labour and capital). In addition, decisions are made from the point of view of the home. In such decisions, the well-being of the household and family override profit considerations. Smallholder farmers prioritize the satisfaction of subsistence requirements before making profits. Households engage in diverse activities, such that they tend to have limited management time for any particular activity. In addition, low education levels and limited access to information tend to reduce the quality of management on small farms. Services, such as information, marketing, transportation, storage and processing, are limited (Hildebrand, 1986).

This has key impact for the technologies that smallholder farmers use in their livelihood strategies. Households are also influenced by their interaction with external factors, i.e. agro-ecological and socioeconomic environments (Ruben, Moll & Kuyvenhoven, 1998). The agro-ecological environment reflects the potential agricultural activities which households might engage in.

On the other hand, the socio-economic environment determines the activities that households select. The socio-economic environment is determined by the macro-economic policies (e.g. prices, institutions, and laws). The task of understanding how the livelihood strategies of households are influenced by the socio-economic and agro-ecological circumstances around them is made easier by the fact that farmers have been observed to be rational in their behaviour. Households use their assets to achieve their livelihoods. The assets are in the form of natural resources, social and political, human, physical and financial assets (Scoones, 1998).

In terms of natural resources, land, water, common-property resources, flora and fauna can be mentioned. Social and political assets are the networks, social claims, and affiliations from which households could draw benefits to meet some of their livelihood requirements. Human assets, such as knowledge, skills, and good health, are also put to use in achieving livelihoods. Financial

assets comprise cash, credit, savings and physical assets, such as physical infrastructure, in occurrence roads, markets, clinics, schools, and bridges. These enable households to pursue different livelihood strategies (Mudhara, 2010).

2.6.1 Obstacles faced by smallholder farmers and approach of empowerment

Bembridge (2000) found that the majority of smallholders included in the study area were facing similar barriers, including lack of fencing, less-developed infrastructure, lack of credit and access to markets, water scarcity, theft of farm produce, poor access to roads, inadequate soil conservation, lack of adequate draught power, and lack of good management.

Merle, Oudot and Perret (2000) found in their study that farms were not very productive and that farmers, after the withdrawal of the government assistance, were encountering difficulties in incorporating into the markets and were struggling to pay their bills and cover other expenses. They would most likely find it impossible to comply with the new National Water Act, in terms of which they would be required to pay for water and cover the running costs of the irrigation scheme under consideration.

Smallholder farmers operate in a vulnerable environment. Accordingly, their success demands considerable rainfall. The rain is always uncertain and other climatic conditions can also have a negative influence on the sustainability of smallholder farmers. Their vulnerability is made worse by not having access to credits facilities (and often their livestock and crop are not insured) and then, in the case of drought, flooding or thunderstorm, they risk losing everything. The majority of smallholder farmers still do not have access to adequate extension services, credit facilities and input supplies. Different diseases or pest may devastate their crops or livestock.

Development models suggest that the rural population can become the engine of economic growth if it can be harnessed to make meaningful contributions (Hayami & Ruttan, 1971). Employment figures given by Cousins (2009) indicate that 4 million people in South Africa are involved in smallholder agriculture. This statistic indicates the vast contribution that this sector could play if its members could find satisfaction and income from working on their farms. The big concern is what policy options are available to stimulate this sector into sustained productivity and contribute to economic development.

Currently, government has created numerous initiatives to develop smallholder agriculture. This has included placing extension officers in the wards. The extension officers are mandated to

implement government programmes which are rolled out nationally and provincially. The government has rolled out several programmes where land is identified and then the government contracts external service providers to put the identified land to productive use in that season. The land owners can then harvest and take ownership of the produce. Results to date are disappointing in that the programmes have largely turned out to be government transfer programmes, rather than those which cultivate productivity. The land reform programmes are not reinforced by supporting measures that ensure sustainability. No markets have been provided for the surplus production. Even in places where the farmers can continue to purchase, the inputs used in the schemes are not developed. Whereas the programmes bring in their own traction power, no mechanism is put in place to ensure that the farmers continue to have access to traction power afterwards (Mudhara, 2010).

Hence, smallholder farmers settle themselves on commonage land under municipality management. The commonage lands were bought from farmers in the mid-1800s for rental to commercial farmers or community usage, which has been supplemented by the Department of Land Affairs (DLA) which has provided new farms to the municipalities since 1994. Since 1995, the DLA's policy has been to use commonage as a nurturing ground on which smallholder farmers can be nurtured towards becoming commercially oriented and so ultimately acquire their own land through the Land reform (Benseler, 2003).

2.6.2 Land Reform in the former homelands and the financial implications

Through land reform, the government has intended to ensure security of food and means of existence in a country where there are extreme inequalities of resource distribution and where links between black populations and commercially-oriented farming had been historically removed. As it only focused on land, being farming land and residential or urban land for peri-urban agricultural projects, the first phase of land reform implemented by the Department of Land Affairs only allocated Settlement/Land Acquisition Grants (SLAG) of R15 000 (later R16 000) per household. These grants were mainly allocated within the framework of the Land Redistribution Programme for purchasing land, but they could also be used for agricultural investments (on communal land or land acquired through the Restitution Programme) or even for housing projects outside the farming sector (Anseeuw & Mathebula, 2008).

As the grants were concentrated on the rural and the poorest part of the population, very little extra investment occurred. SLAG has, consequently, been criticized for not providing the means to

structurally change South Africa's agricultural sector, and in fact for having kept previously disadvantaged populations impoverished (Ministry of Agriculture and Land Affairs, 2000).

In 1999, the focus on subsistence farming was abandoned and the development of an emergent commercial black farming sector became the ministry's priority. Land reform measures no longer aimed at transferring land to black households and promoting self-sufficiency, but rather at creating a structured, small-scale commercial farming sector, improving farm production, revitalizing the rural environment, and creating employment. This strategy coincided better with the government's more liberal orientation. Each household is entitled to only one SLAG. A household that uses the grant to purchase land will not have access to any additional SLAG for the construction, improvement or other farm investments. Similarly, the Land Redistribution for Agricultural Development (LRAD) sub-programme has become the main programme of the government. The LRAD sub-programme does not replace the programmes implemented in 1994, which still exist, but builds on the work of the SLAG for projects concerning agricultural development. As from 1999, SLAGs have been limited to residential projects. The LRAD sub-programme gives grants to previously disadvantaged people to help them buy farmland or develop land they have already acquired privately. The LRAD projects focuses on the transfer of agricultural land to individuals or to limited groups with the objective to develop commercially-oriented farming activities (Ministry of Agriculture and Land Affairs, 2000). To encourage the development of farming activities, the LRAD sub-programme insists that the beneficiaries contribute own funds (either actual or in-kind) to the project. For own contributions of R5 000 to R400 000 per person, the LRAD subsidies vary from R20 000 to R100 000 (on a decreasing scale). The awarding of subsidies is thus not only based on the equity principle, but on the viability of the project (Anseeuw & Mathebula, 2008).

Anseeuw and Mathebula (in Van Rooyen, 1997) argue that if this political choice is as justifiable as the previous one, this new orientation implies a predisposition to focus on a category of potential farmers having specific means, such as financial knowledge. Certain associations assert that the LRAD subsidies benefit only a small elite echelon of farmers (less dependent of support than the most impoverished). Others note that these measures aimed at promoting the commercialization of agriculture are driving forces for agricultural and rural revitalization.

In the same manner, in consequence of all the negative output brought by the LRAD, the government has developed a new strategy, the Proactive Land Acquisition Strategy (PLAS). Under this approach, the state, or an intermediary trust (e.g. a Section 21 non-profit company) will become the initial owners of the land, rather than the beneficiaries. This creates possibilities for the state to provide leased land to targeted beneficiaries on a trial basis, while they become

established, prior to transfer of title. The system of land acquisition, however, remains voluntary with full market-related prices being paid (Lahiff, 2007).

In the same view, many municipalities admit that commonage must also allow for utilization by low-income households who want to use the land for food security and subsistence farming. Therefore, municipalities are now in charge of agricultural land redistribution at local level as this is one of the very few ways in which emergent farmers can increase their stock capacity. In the Northern Cape, the three departments have only recently started to work together and their main objectives are to construct municipal capacity to make commonage effectively productive for land reform objectives and pro-poor development. Lack of departmental policy goes hand in hand with lack of policy at the local level (Benseler, 2003). Therefore, in rural areas, smallholder farmer households only derive a small proportion of their livelihoods directly from agricultural sources. This is attributable to strictures imposed by the apartheid (Mudhara, 2010).

2.7 AGRICULTURAL COOPERATIVES

Agricultural value-adding cooperatives are frequently rationalized as providing a way for decreasing transaction costs and alleviating hold-up problems caused by asset specificity through vertical coordination of farmers into processing and marketing activities (Cook & Iliopoulos, 1999). The cooperatives also represent an extreme form of horizontal coordination in which farmers subordinate their use rights and decision-making power to a manager in exchange for a different set of property rights, namely benefit and voting rights. In a development situation, cooperatives are always conducted with hopes that horizontal integration will reduce the fixed ex ante transaction costs that keep small farmers out of product markets, and these hopes are growing in proportion with mounting concerns about food safety and the environment (Poulton & Lyne, 2008).

It is certain that horizontal integration was an important part of the thinking behind South Africa's new Cooperatives Act, 14 of 2005. Speaking during his visit to land reform projects in the country's North West province, Deputy Minister of Agriculture and Land Affairs, Dirk du Toit, commented, "It is difficult for individual emerging farmers to survive in this industry. This is why it is important for them to form cooperatives to not only penetrate the market but also be competitive" (BuaNews, 2006).

One of the objectives of this Act is to ensure the provision of support programmes for 'emerging' cooperatives, a term used to describe development-oriented cooperatives established to promote the interests of previously disadvantaged people. In June 2005, the Minister of Trade and Industry,

Mandisi Mpalwha, announced that incentives and capacity-building grants had been designed for development-oriented cooperatives, and that government financing agencies (including Khula and SEDA) had been mandated to support cooperatives (Government Communication and Information System (GCIS), 2005). The convenience of having committed support suggests that cooperatives will also play an important role in the management of community-owned resources acquired through land reform, including reforms planned for the country's communal areas. The Cooperatives Act explicitly targets black people in rural areas. This study questions the decision to dedicate public support to cooperatives when the interests of their members might better be served by other forms of organization (Lyne & Collins, 2010).

2.7.1 Principles of cooperatives

The seven internationally recognized cooperative principles are: voluntary and open membership; democratic member control; member economic participation; autonomy and independence; provision of education, training and information; cooperation among cooperatives; and concern for the community.

In 1987 the United States Department of Agriculture (USDA) adopted just the three principles of user ownership, user control and user benefit (roughly the first three ICA principles), following arguments that cooperatives operating in global markets, particularly agricultural marketing and supply cooperatives, cannot afford to internalize the ICA values and principles but should focus on fewer, more self-centred principles, just to survive (Birchall, 2005).

The other principles, it could be argued, are upheld by other organizations. Essentially, then, a cooperative is a user-owned and user-controlled business that distributes benefits equitably on the basis of use or patronage (Barton, 1989). Thus, a farmer member who accounts for 5 % of the volume of agricultural products delivered to the cooperative would receive 5 % of the net earnings derived from the handling, processing and marketing of those products. "Such patronages dividends help boost the income of farmers directly or by reducing the effective cost of the goods and services provided" (NCFC, 2005).

The United States National Cooperative Business Association (NCBA, 2005) also emphasizes the unique characteristics of cooperatives, relative to other (investor-oriented) businesses:

- Cooperatives are owned and democratically controlled by their members (i.e. those that use the cooperative's services or buy its goods) and not by outside investors. Members

elect their board of directors from their ranks. Major policy decisions are based on the one-member, one-vote principle, regardless of each member's investment in the cooperative.

- Cooperatives return surplus income (revenue over expenses and investment) to members in proportion to their use or patronage of the cooperative, and not proportionate to their investment or ownership share.
- Cooperatives are motivated not by profit, but by providing a service to satisfy members' requirements for affordable and quality goods or services.
- Cooperatives exist solely to serve their members.
- Cooperatives pay taxes on income retained for investment and reserves. Surplus revenues are returned, according to patronage, to individual members who pay taxes on that income. The NCBA (2005) argues that cooperatives "are formed by their members when the marketplace fails to provide needed goods and services at affordable prices and acceptable quality. Cooperatives empower people to improve their quality of life and enhance their economic opportunities through self-help".

The NCFC (2005) echoes the points that cooperatives are formed to strengthen bargaining power; maintain access to competitive markets; capitalize on new market opportunities; obtain needed products and services on a competitive basis; improve income opportunities; reduce costs; and manage risk. Badically, farmers form cooperatives with the objective to generate greater profits, by obtaining inputs and services at lower costs than they could obtain elsewhere or that were not available, and by marketing their products at better prices or in markets that were previously not accessible (Barton, 2000).

Different cooperatives have been settled around the world to serve the interests of members, including consumer, producer, worker, and service cooperatives. NCBA (2005) declared that there were 48 000 cooperatives serving 120 million people in the USA, whereas globally some 750 000 cooperatives serve 730 million members. The various cooperative types provide members with diverse products and services, including financial services, equipment and farm supplies, marketing of agricultural products, consumer goods, utilities (e.g. electricity and telephone services), housing, and other services (e.g. insurance).

Barton (2000) points out that although cooperatives are common in many parts of the world, their most extensive and successful use during the last century has been in North America and Europe. In general, there are three types of agricultural cooperatives in terms of their main activity, namely marketing cooperatives (which may bargain for better prices, handle, process or manufacture, and sell farm products), farm supply cooperatives (which may purchase in volume, manufacture,

process or formulate, and distribute farm supplies and inputs such as seed, fertilizer, feed, chemicals, petroleum products, farm equipment, hardware, and building supplies), and service cooperatives which provide services such as trucking, storage, ginning, grinding, drying, artificial insemination, irrigation, credit, utilities, and insurance (Cropp & Ingalsbe, 1989).

These cooperatives usually differ in various ways with regard to functions performed, and can also vary greatly in size. Most of the agricultural cooperatives are relatively small businesses. In 1999, for example, 50 % of cooperatives in the US had less than \$5 million in gross business volume and accounted for about 3 % of total agricultural cooperative business, whereas 0.5 % of cooperatives had a gross business volume of \$1 billion or more and accounted for 43 % of total business volume (Cropp, 2002).

2.7.2 South Africa's cooperatives for smallholder farmers and land reform beneficiaries

Smallholder farmers in South Africa have limited access to factors of production, credit, and information, and markets are often constrained by inadequate property rights and high transaction costs. Understanding the causes of cooperative failures in the former homelands of South Africa is important in order to avoid similar occurrences in the future. Poor management, lack of training, conflict among members, and lack of funds appear to be important contributory factors. Members of failed or poor-performing cooperatives appear to have failed to clearly understand the purpose of a cooperative, how it functions, and what its members' rights are. This could stem from their lack of education, training, and information.

South Africa's 2003 Presidential Growth and Development Summit endorsed special measures to support development-oriented cooperatives. Following this commitment, government responsibility for cooperatives was transferred from the Department of Agriculture (DoA) to the Department of Trade and Industry (DTI) (Philip, 2003).

The new Cooperatives Act introduces public support for development-oriented cooperatives. The DTI will treat these initiatives as small and medium enterprises (SMMEs) and, as such, they will qualify for all of the incentive and support programmes presented by the Department and its agencies to SMMEs in the broad areas of training and access to finance. Beyond this, the DTI will also offer dedicated financial and capacity building support to cooperatives. The additional financial support will most likely include incentives to assist start-ups (Mpalwha, 2005).

Smallholder farmers in South Africa should exploit the wave of support for cooperatives, even though future growth of their enterprises may be constrained by institutional deficiencies inherent in traditional cooperatives. However, this approach is expected to waste scarce public resources as few development-oriented cooperatives are likely to survive the initial stages of enterprise development when weak institutions are imposed on communities deprived of capital and lacking in business skills. The historical record of such cooperatives has been miserable in South Africa (Ortmann & King, 2006).

The general failure of agricultural cooperatives in South Africa's communal areas has been blamed largely on poor management (Van der Walt, 2005). Inopportunistly, this immature judgement seems to have distorted plans for supporting cooperatives in favour of training. Training is important, but it will have little impact if underlying institutional problems discourage managers and members from growing the cooperative business (Lyne & Collins, 2010).

Cook (1995) argues that farmers who restructure their cooperatives in ways that alleviate the problems created by flawed institutional arrangements have a bright future. His positivity, demonstrated by the rapid growth of New Generation Cooperatives (NGCs) in the USA is grounded in the argument that cooperatives hold a transaction cost advantage over firms owned by external investors because incentives are better aligned when farmers contract with their own organisation (Sykuta & Cook, 2001).

By way of illustration, consider a cooperative established to manage a common pool grazing resource, following the implementation of the Communal Land Rights Act (CLaRA), Act 11 of 2004. CLaRA's objectives include a reduction in open access land and the development of agricultural and tourism enterprises (Rugege, 2006). Consider that members of the community pay a small fee to join the emerging cooperative and that this fee finances one share in the cooperative. Livestock owned by shareholders can be added to an aggregate herd managed by the cooperative. Mature animals can be reclaimed by their owner or be sold by the cooperative, with the cash proceeds accruing to the owner. In both cases, the cooperative imposes a levy to cover operating expenses. To improve herd productivity and net benefits accruing to member patrons, the cooperative must fence off and supply water to rotational grazing camps. Although some members could invest more equity capital to help finance these improvements, they are reluctant to do so owing to ill-defined benefit rights (Lyne & Collins, 2010).

Section 43(2) of the South African Cooperatives Act, which defines the attributes of capital credits, does not preclude transfers of capital credits between members and suggests that a cooperative

could sanction such transfers in its constitution. However, transferability is unlikely to translate into tradability because capital credits are redeemable (Lyne & Collins, 2010).

Conversely, conventional cooperatives often do not invest in long-term assets (improvements) or in imperceptible assets (such as training and research) owing to the “horizon” problem (Cook, 1995). Establishing new generation cooperatives may resolve this problem if delivery rights and obligations of members can be enforced. Other problems inherent in conventional cooperatives, including free-rider, portfolio, control and influence cost problems (Cook, 1995), could also create weaknesses for members of these cooperatives (Ortmann & King, 2007).

Roets (2004) recommends the use of cooperatives to facilitate the marketing of goats by small-scale (communal) farmers in South Africa. Most of these farmers have small goat herds (10-20 animals). This increase the transaction costs for individual farmers, since selling one animal often involves the same effort as selling 10 or more. In addition, specialized (expensive) inputs may be required to better manage and sell animals (e.g. medicines, ear tags, tools, animal brand registration, transport facilities, and holding pens). Roets (2004) argues that collective action by goat farmer cooperatives can provide these services and inputs cheaper than farmers can acquire them individually and also contends that cooperatives are a culturally acceptable business form to small farmers because they work on similar principles as “stokvels” and burial societies, which these farmers are already familiar with. In view of the advantages and disadvantages of conventional cooperatives and the fact that the South African government is promoting the formation of cooperatives among rural communities, the cooperatives’ support for the case study farmers in Riet River Irrigation Scheme will be further analysed.

Agricultural cooperatives serving smallholders in rural areas of South Africa have generally not been successful in promoting agricultural development and members’ economic welfare (Ortmann & King, 2007).

Van der Walt’s (2005) study on cooperative catastrophes in Limpopo province indicated that poor management, lack of training, conflict among members (attributable mainly to poor service delivery), and lack of funds were important contributory factors.

Machethe (1990) interviewed members of six agricultural cooperatives in a former homeland of South Africa to determine the causes of the poor performance or failures of those cooperatives and ascertained the following major causes:

- Members’ lack of identity with their cooperatives

- Members' lack of understanding of their cooperative's role
- Failure of cooperatives to involve members in policy decision-making
- Failure of cooperatives to compete with other businesses
- Inability of members to dismiss inefficient management
- Failure of cooperatives to provide transport for delivery of members' purchases
- Inability of cooperatives to keep adequate stocks of farming inputs
- Inability of cooperatives to provide sufficient credit
- Subsistence nature of agriculture

Among the respondents, nearly 60 % gave replies that indicated that they had joined a cooperative so that they could purchase goods on credit (24 %), to sell produce through the cooperative (22.5 %), and on advice of the local agricultural extension officer (12.5 %). Only 41 % understood cooperatives to be owned by members and 22.5 % indicated that they did not know who the owner was, while 19 % thought the cooperative belonged to the chief. About 26 % of respondents indicated there was no difference between a cooperative and another business undertaking and 19 % did not know of a difference, while only 11 % indicated that the main difference was that the cooperative was owned by its members. These responses clearly suggest that many members do not understand what a cooperative is and what its objectives are. In addition, about 48 % of members were buying goods from local shops, which undermined their cooperative's income. Main reasons given were that the cooperatives did not carry all items (23 %) and that local shops' prices were lower (16 %). Thus, it appears that the sample of cooperatives did not compete effectively with local shops, which weakened their financial position. Also, 61 % of respondents felt that they had little or no influence on the policies of their cooperatives. This may indicate an authoritative style of management where decisions are often taken without member participation or consultation (a principal-agent problem). Members also felt powerless to change management or were unaware that they had the power to do so (Machethe, 1990).

The study responses imply that cooperative members did not clearly understand the purpose of a cooperative, how it functions, and what its members' rights are. This could stem from their relative lack of education and training or from ignorance (due to inadequate information). The state may also apply to the case study farmers who are constrained by relatively poor education, lack of access to information, and infrequent contacts with their local extension officers (who also may not understand the cooperative concept because of limited exposure to it). It should also be recognized that external factors, such as uncertain property rights, poor road and communication infrastructure, and poor access to input (e.g. credit, hybrid seed, and fertilizer) and product markets, also play a crucial role in the poor performance of cooperatives in the less-developed

areas of South Africa. These constraints need to be addressed as well if cooperatives are to play a promotional role in rural development (Machethe, 1990).

According to the Department of Trade and Industry (Department of Trade and Industry (DTI), 2003), poverty in rural areas is caused by not having appropriate access to resources (such as land, capital, and infrastructure) and by the poor availability of social services (e.g. education, health, and housing). A necessary, but not fully sufficient, condition for the development of rural areas is for the government to play a proactive role in creating a legal, economic, administrative and institutional environment that will help promote private initiatives, such as through the formation of credit unions (i.e. savings and credit cooperatives, which could mobilize capital) and agricultural cooperatives, which could be successful in areas where smallholder farmers produce surplus crops or livestock for sale and require modern agricultural inputs.

An additional challenge in instituting cooperatives is how to promote knowledge of cooperatives among potential members and trading partners. Both government and the private sector may play a role in this regard. Government initiatives could involve engaging well-trained extension officers, at both provincial and national level, and DTI staff in training and advising potential cooperative members in various districts. Private initiatives might involve NGOs (which could be contracted by government to inform and train potential members on establishing and managing cooperatives) and possibly processors and marketers (buying agents) involved in supply chains of high-value products (e.g. vegetables, fruit, and cut flowers), who could benefit from doing business with cooperatives rather than with many smallholders. Indispensable for encouraging cooperatives among potential members, is the availability of venues and opportunities for them to convene to discuss the benefits and formation of cooperatives (Ortmann & King, 2007).

Restricted access to capital for smallholder farmers and small businesses is a major constraint to rural development in South Africa, including the formation of cooperatives. Smallholders often have to rely on informal lenders, such as friends and family and rural or township lenders, to meet their financing needs (Kuhn, 2003).

Commercial banks have been hesitant to provide credit to smallholders and small entrepreneurs owing to the high risks associated with lending to them. These risks are attributable to insufficient or absent collateral (due to poorly defined property rights and low wealth levels), poor financial record-keeping, and high transaction costs involved in granting small loans (Kuhn, 2003).

The Government of South Africa launched multiple initiatives from the mid-1970s to promote access to credit for low-income producers, generally with limited success (Kuhn, 2003:80-84). Numerous financing models and initiatives have since been suggested, with some government role in reducing credit market failures (Kuhn, 2003:84-89). Development finance institutions, such as the Land and Agricultural Bank (a government parastatal), Ithala Bank, African Bank and Umthombo Agricultural Finance (for small-scale sugar farmers), have in recent years been relatively successful in extending credit to small scale entrepreneurs (Kuhn, 2003:89), and could play a role in providing credit to potential members and “seed capital” for establishing cooperatives.

2.7.3 Cooperatives conversion

Research conducted by Schoeman (2006) found that the de-registrations and conversions of numbers of registered co-operative into public and private companies took place in the late 1990s. The period was marked by a large number of de-registrations and conversions of cooperatives into companies for a number of reasons, such as the lack of a tax advantage for cooperatives, the legal restrictions that had been previously placed on co-operatives, and certain economic reasons for reconstruction where the profit-making objective had become increasingly important within the cooperative structure. Whatever the reason for the large number of de-registrations and conversions, this has certainly been one of the most prominent factors reflecting negatively on co-operatives as business enterprises.

While many co-operatives converted into companies, a select few existing co-operatives merely refused new membership to certain persons and classes of persons, thereby continuing the previous non-democratic government’s discriminatory political ideals of exclusion and preventing the creation of opportunities and the widening of the economic sphere. On the other hand, some established co-operatives neither converted into companies nor refused new membership; and a select few embarked upon the challenge of looking after the interests of emerging farmers. Many members of cooperatives remain under the impression that it is far more beneficial to obtain products at a more competitive or cost-effective price through a co-operative than to convert the enterprise into a company. Therefore, in this sense, conversions into companies were based on political reasons and not because such a conversion would be the most economically feasible option, of that it might prevent growth and political change or transformation; indeed, the continued existence of the co-operative free from discrimination in any sense, would actually facilitate transformation and the creation of opportunities in the economic mainstream in general (Schoeman, 2006).

2.8 CONCLUSION

Generally, smallholder farmers are considered to be poor in terms of production. The production of smallholder farmers and land reform beneficiaries also differs owing to the differences in technical skills, inputs used, socio-economic situation, age, land access and the way they exploit the land, their affiliation condition to the cooperatives, etc. Research has to be undertaken to ensure that smallholder farmers' irrigation schemes and dry land, as well as areas worked by land reform beneficiaries, become more productive and sustainable. While there have been a number of conversions of cooperatives into private companies, attention must still be focused on how these newly converted cooperatives can facilitate the agricultural empowerment of smallholder farmers and land reform beneficiaries. The case study presented in the next chapter will contribute in linking these findings to the situation of smallholder farmers and land reform beneficiaries in general.

CHAPTER 3

RESEARCH METHODOLOGY

The agrarian systems diagnosis developed in this study provides a methodology for understanding the diversity and the complexity of agricultural practices. It provides a research and planning tool that has facilitated the understanding of each form of agriculture and roughly establishes the characteristics of the historical transformations and geographical differentiations of a rural society. This enables one to define more specific and appropriate policies, strategies, programmes and projects that are related to poverty or resource management. This research takes a particular approach to studying the agrarian diagnosis and the diversity of farming systems in the Riet River Irrigation Scheme around the Free State and Northern Cape borders. In this chapter the research design, sampling, constraints experienced and analysis used to meet the identified objectives are examined.

In order to achieve the main objectives developed earlier in the introduction, a landscape study, detailed interviews with farmers, and a typology classification of the farmers characterizing the farming systems were undertaken. These included: the provision of a historical overview of land reform in the Free State and Northern Cape, which has been detailed in the literature review; and diagnosing the farming types and land use practices of the identified farmers, including the beneficiaries of the land reform. The methodologies used in this research to describe and analyse these farming types are discussed in this chapter. The focus is firstly on the presentation of the study area, the objectives and methods, data collection, analysis of farming systems, typology construction, the methodological arrangement of the research process, and data analysis, and the chapter culminates in a conclusion.

3.1 THE STUDY AREA

This section provides an overview of the reason for choosing the Riet River Irrigation Scheme as the study area. It also gives a short geographical presentation of the area with respect to the climate, soil and vegetation.

3.1.1 Choice of the study area

After a brief observation of the study area undertaken, the research area was chosen on account of the diversity of farming activities present between Kimberley and Douglas, two farming towns that are 120 kilometres apart. The objective was to cover a set of farming systems as diverse as possible and to evaluate the effectiveness of different services provided by the cooperative in empowering farmers. As such, the area was therefore chosen as it incorporates irrigation schemes, communal lands, municipal lands, and several land reform projects. The presence of the cooperative might potentially lead to even more farming systems.

It is important to record that the choice was also motivated by an intention to endeavour to compare the farming activities falling under the two irrigation schemes (the Orange-Riet Water User Association around Kimberley and Jacobsdal with the Orange - Vaal Irrigation Scheme around Douglas) which have two different qualities of water and to understand the extent to which the quality of water of the two rivers can impact on farming practices. However, a decision was thereafter made to reduce the size of the area because of the fact that the farms near Douglas are too big in size and do not reflect diversity for typology purposes, whereas diversities were identified in the Orange-Riet Irrigation Scheme around Jacobsdal and Modder River.

3.1.2 Geographical background

It is important to mention that the canal which irrigates the scheme was built after the Second World War by Italian prisoners brought to South Africa. Thereafter, the area of the scheme was divided into 176 farms of 20 to 30 ha each, with 17 to 25 ha water rights for each farm, all with the objective of developing white farmer agriculture in South Africa and converting the builders of the scheme (90 Italian prisoners of war) into farmers. Hence, the scheme has been well structured and farmers have become specialized in using diverse farming systems. These farmers accordingly present a view of a group of farmers with homogenous farming practices (more or less) which had attracted our focus for the typology study.

Jacobsdal is a small farming town in the Free State Province of South Africa. The town was laid out in 1859 by Christoffel Jacobs on his farm Kalkfontein, and currently houses 6 500 inhabitants. It has a demography made up of 21.5 % black people, 53 % coloured people, 0.2 % Indian or Asian people and 25.3 % white people; and according to a recent census, 95.4 % of the population speaks Afrikaans, 2.5 % Sotho and 1.3 % English (Census, 2001). The town falls within the Riet River irrigation settlements, which starts about 3 kilometres west of the town and extend 15 km, up

to the confluence of the Riet and Modder rivers at Ritchie. Jacobsdal lies on the R705 road, 154 kilometres west of Bloemfontein and only 15 kilometres east of the Northern Cape Provincial border. It is a small town with various crops under irrigation, such as grapes, potatoes, lucerne and groundnuts.



Figure 1: Physical map of South Africa, study area shown by the red square

3.1.3 Climate

The climate of the study area is semi-arid, characterized by cold-dry winters not favourable for crop development and animal health, but with an average of 20°C from May to September, which creates a possibility for animal and crop production. The summers are wet and warm with positive effects on livestock, such as increasing food consumption, milk production, daily gain of animals; and crop production, through the practice of different irrigation systems (flooding, pivot, sprinklers, moving wheels, etc.).

3.1.4 Soil

The soil of the study area is mostly composed by sedimentary limestone rocks, more or less hard, on which is made an underdeveloped soil given the low precipitations, less deep, basic and sandy yellowish. Other limestone’s deposit come from the high evaporation of the underground water or rain water infiltrated carrying along the calcium in the soil. During the upwelling, the limestone speeds up in surface. This kind of soil is hard to work on because weakly deep.

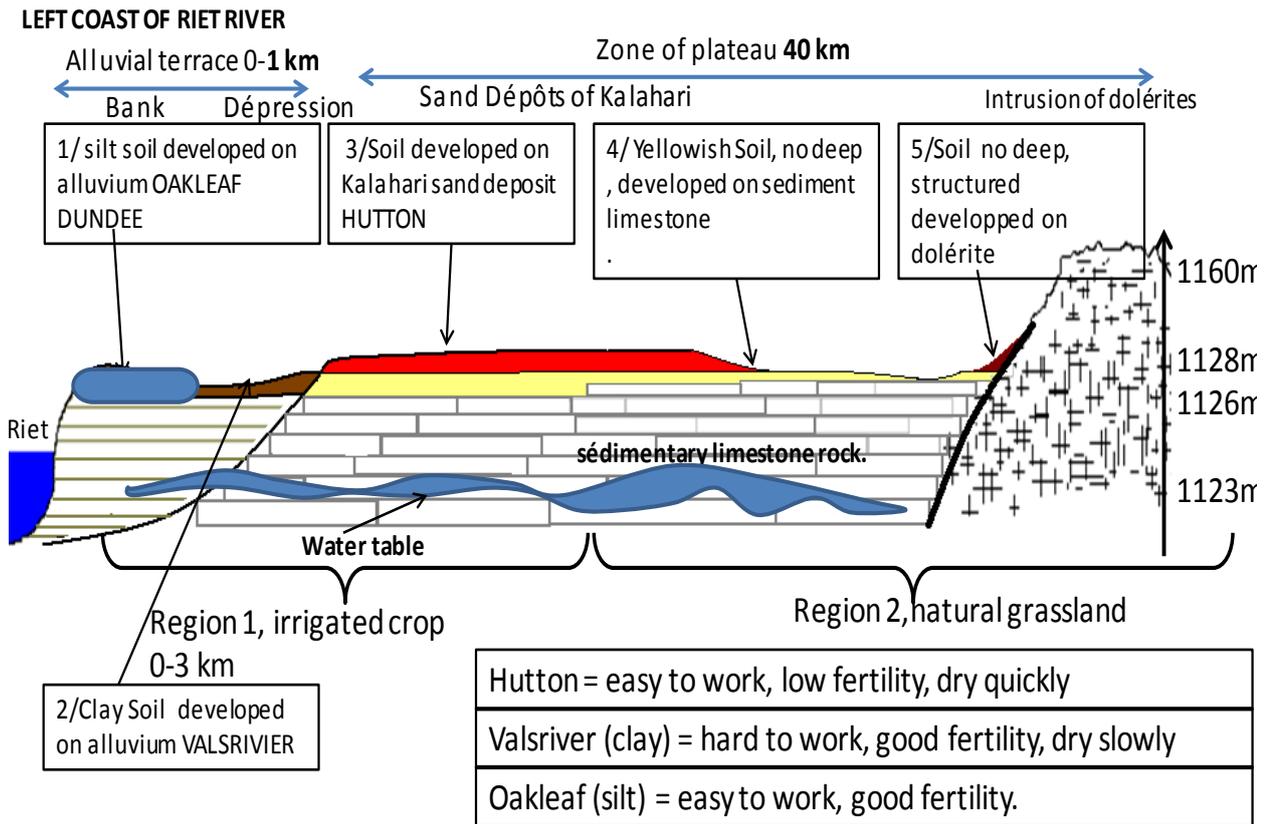


Figure 2: Soil view of the study area, left bank of Riet River

On the bedrock of volcanic seams of dolerites, is deposited a clay red soil but well composed, less developed and less deep. This rocky area is not cultivated owing to the fact that it contains dolerite rocks disseminated throughout the area. On top of the two types of bedrock, other sediments, sands from the Kalahari have highly accumulated recently. The soil deposited on that deposit is independent from the subjacent rocks. They are characterized by the sandy texture, from some centimetres to several meters deep, weakly structured or heavily built. A considerable number of crops are found on this type of soil, which is easy to work but poor at the clay-humus complex level. Their water retention capacity is low; their important reserve is 1,4mm/cm. The red colour of these soils indicates that they can drain water normally. Farmers call this type of soil "Hutton". On the left bank of the Riet River and Modder River, other sediments have been deposited over time by floods (alluvium). From those deposits and the organic materials accumulated in the depressions, the soils of clay-loam sandy texture (they contain between 35 and 40 % clay, 12 to 20 % of silts, 50 to 60 % sand) are then formed. Those soils are deep and more or less spread along the banks of the river (from 0 to 1 000m) and are the most structured of the region; their water retention capacity is excellent, compared to those of other types of soil, with an important reserve

of 1,8 mm/cm. But they are heavy and difficult to work on. Farmers call them “Valsrivier” and “Oakleaf”.

3.1.5 Vegetation

The degradation of semiarid grasslands follows a general pattern where grazing alters the species composition from long-lived perennials to annuals or short-lived perennials. The vegetation of the study area is adapted to the semi-arid climate and is part of the bioregion situated at the east of the biome (Nama Karoo). That biome is characterized by an open savannah of shrub grass vegetation on the soil, growing shallow on limestone rocks. Most of the plants are xerophytes. The rainfall being very low, few trees are found in this region. The open dry zones of savannah spread across the entire plateau. The spontaneous vegetation which differs from the savannah is developed on the red, sandy soil, deeply or on limestone soil, less deeply. That landscape is populated by dolerite reliefs, here and there. The plants are resistant to drought and are adapted to soil poverty, and there are herbaceous plants of short cycle, such as Gramineas, which can achieve a reproduction cycle within three months. Some aromatic plants (*Harpagophytum procumbens*, *Barleria macrotelia*) refresh themselves by producing volatile essences; the leguminous trees (*acacia eriobola*) have deep roots to reach the water table; spiny trees (acacia) and bushes (camphors) have a reduced surface area of leaves, being caduceus or having a significant cuticle which limits transpiration of the vegetation of the study area.

During the rainy summer, herbs dominate while bushes persist during winter. The biomass produced by the xerophytes species is very low but it forms an important forage resource of a low animal charge density. Along the Riet River on the plain alluvial terraces, the vegetation is grassy or herbaceous; the spontaneous vegetation is characterized by shrub grassy plants (*succulent shrubs*), herbs (*cineraria cordifolia*) and flood herbaceous, gramineas and aromatic herbs (*cineraria dregeana*). But we also find some small, endemic trees (*Acacia Karoo*, *Celtis Africana*, *Salix mucronata*). This natural landscape has disappeared little by little because of the effects of agricultural activities and the construction of several dams, as well as invading species, such as eucalyptus (*Salix babylonica*), brought in by people.

3.2 METHODS AND RESEARCH DESIGN

Table 1 below synthesizes the three major objectives of this research (for more details, see chapter 1) and the methods used to collect data and the associated techniques for analysing the

data. It shows that primary data was collected through surveys, interviews and observations in order to meet all the objectives. Secondary data was collected through a review of literature, documents and collections of maps in order to achieve the same objectives. In this chapter the methods used and the techniques employed to collect and analyse data in order to achieve the specified objectives are described, according to primary and secondary data collection methods.

Table 1: Objectives, methods and analysis of data

OBJECTIVES	METHOD	ANALYSIS
Better understanding of South African agriculture.	-Primary data: survey, semi-structured interviews with farmers and government officials (extension officers), observation. -Secondary data: collection hard copies of maps of South Africa and collection of the electronic spatial data of the Riet River Irrigation Scheme.	Qualitative and quantitative, with descriptive analysis Geographic Information System (GIS) analysis. Observation through transect walks. Review of documents.
In-depth reflection regarding agrarian change in South Africa and policy implications.	-Primary data: Survey, semi-structured Interviews with farmers and government officials (extension officers), observations. -Secondary data sources	Qualitative and quantitative Literature review Review of documents
Better understanding of the role of GWK (Griqualand West Cooperative in agricultural empowerment of small-scale farmers.	-Primary data: Semi-structured Interviews with GWK key informants and farmers. -Secondary data sources	Qualitative and quantitative Cross-analysis of types and GWK services. Content analysis review of literature: books, journals. Government and GWK documents. Literature review

3.3 RESEARCH DESIGN

A multi-method approach was conducted to meet the objectives of this research. This approach involved the use of a variety of data sources, as indicated in Table 1, which engendered qualitative and quantitative data. This multi-method approach offers ways to enrich data for analysis. The research used a mix of techniques to collect primary and secondary data at the provincial, district, and local levels, which included semi-structured questionnaires, semi-structured interview guides, observations and the collection of secondary data.

3.4 SAMPLING

A total of 200 farmers were identified in the irrigation scheme and its dry land, derived from various records and files of the Orange Riet Water User Association (ORWUA) and GWK which were previously recognized as at the end of 2011 and were selected for the study. Categorization of farmers operating within the scheme in terms of their main farming activities led to five different sub-groups: irrigation farmers, livestock farmers, irrigation-livestock farmers, dairy farmers, and game farmers. From the 200 farmers comprising five different farming sub-groups, random sub-samples of 150 farms were selected for the field survey. This method is called stratified random sampling. Stratified random sampling involved the division of the 200 farmers identified in the region into five smaller groups or strata based on their shared attributes or characteristics as listed above. A random sample from each stratum was thereafter taken in a number proportional to the stratum's size when compared to the 200 farmers or applied within each stratum. A total of 150 farmers were proportionally selected from all the five strata and constituted a sample of farmers to be interviewed. Woodard (2001) defined stratified random sampling as a random sample which involves categorizing the members of the population into mutually exclusive and collectively exhaustive strata, and a simple random sample of elements is taken independently within each stratum. This enables an understanding of as much diversity as possible within each stratum.

Table 2: Number of Farmer groups, population, interviewed and the representativeness in the study area

GROUPS	POPULATION	INTERVIEWED	SAMPLE REPRESENTATIVENESS/POPULATION
IRRIGATION FARMERS	71	50	25%
LIVESTOCK FARMERS	30	22	11%
IRRIGATION-LIVESTOCK FARMERS	77	61	30.50%
DAIRY FARMERS	10	7	3.50%
GAME FARMERS	12	10	5%
TOTAL	200	150	75%
TOTAL %	100%	75%	75%

Among the 150 farmers considered for fieldwork, 9 fell within the Settlement Land Acquisition Grant (SLAG) category, 14 in the municipal land (commonages) category and 8 in the Proactive Land Acquisition strategy (PLAS) category. From the sample of respondents selected, 100 in-depth interviews were administered for typology analysis purposes. The length of the interview depended on the responsiveness and willingness of the interviewees to provide answers to the questions. The sampling method was designed to be representative of different farming systems present in the area, which can be generalised to the provincial level for agricultural policy recommendation.

The first preliminary interviews were administered by means of semi-structured questions, set for a sample size of 50 farmers, for obtaining a better understanding of farming and the landscape within the study area. The questions were asked as simply as possible so as to be easily understood by both the respondents and the interviewers. About four months were spent in endeavouring to understand the landscape of the study area, the diversity of farming systems, and livelihood strategies of farmers, as well as the contribution provided by Griqualand West Cooperative in terms of agricultural empowerment of small scale farmers.

3.5 DATA COLLECTION

The collection of data was made possible through the application of different methods that are described in this chapter.

3.5.1 Questionnaire development

The questionnaire used during the preliminary interview consisted of semi-structured questions whereby farmers were given an opportunity to express themselves. This called for the formulation of a questionnaire consisting of semi-structured questions. The design of the questionnaire was conceived to meet the objectives of the research concerning decision-making in respect of on-farm matters, the geographical exercise on the basis of natural capital, demographic details, farming history, farming strategies, on-farm and off-farm income and livelihood strategies, size of the plot subdivisions, how farmers had acquired their plots, farming activities, land use practices of the farmers, obstacles and challenges faced by farmers, implements used and their depreciation, the labour force, and salaries. Questions were also asked pertaining to land tenure, information on sources of water for crop production and livestock purposes, the source of production cost, harvesting, market (with GWK or not), and risk management for the profitability of their farming activities.

3.5.2 Primary data collection

A semi-structured questionnaire was administered to respondents in order to elicit both qualitative and quantitative data. Afrikaans and English were used interchangeably as mediums of communication. Responses were written in copybooks and each interview lasted approximately 2 hours for the complete interview, and 20 minutes for the preliminary interviews.

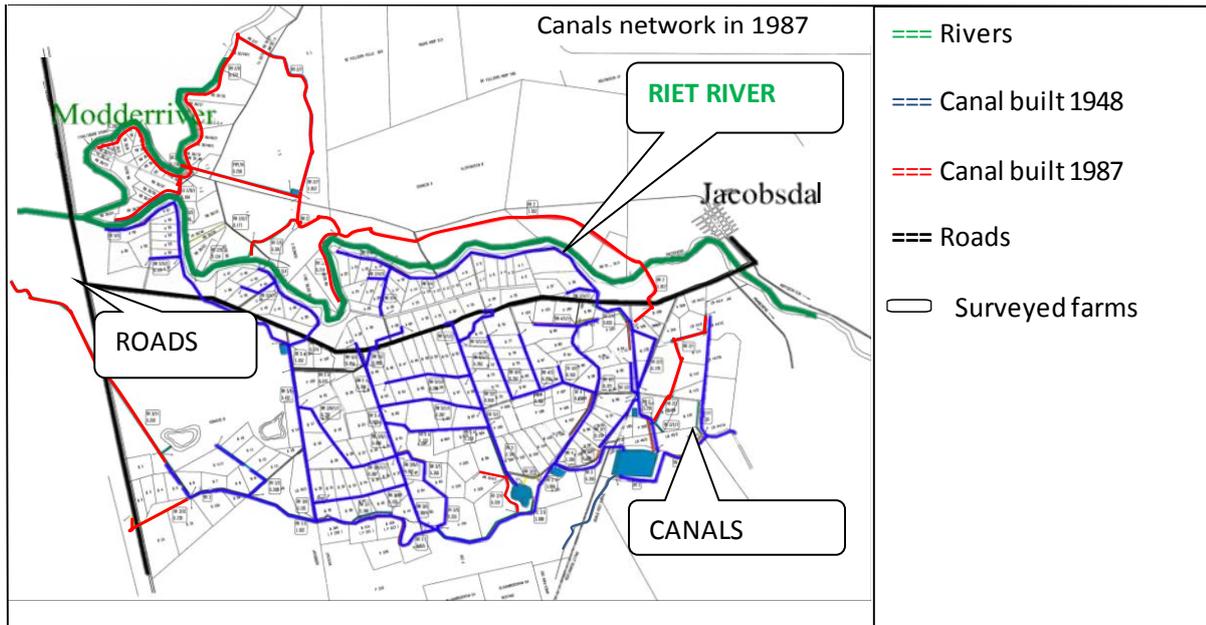


Figure 3: Map of arable and dry land farms surveyed in the study area

3.5.3 Secondary data collection

Secondary data were collected through a review of literature, media articles, and maps obtained from the Department of Agriculture and Rural Development. The electronic spatial data and hard copies of maps were obtained from the GWK and Orange-Riet Water User Association in order to achieve the objectives of this research.

3.5.4 Effective implementation

The Agrarian Diagnosis Project was funded by the French Agency for Development (AFD), in partnership with the University of Pretoria, for the purpose of understanding South African agriculture and forming policy recommendations. Four groups of mixed students from the AgroParistech Institute in France, the University of Stellenbosch, and the host University of Pretoria were spread around South Africa in four particular provinces, namely Mpumalanga, KwaZulu-Natal, Eastern Cape and Free State, for the project implementation. It required four full months of work in the study area located in the Free State Province to finally achieve the accomplishment of this project.

The high reluctance of farmers (to allow the access to their farm and information), being mostly white in the areas surrounding the irrigation scheme around Jacobsdal, made it necessary to make contact with the GWK Emerging Farmers Division, the Water User Association (ORWUA), and a

group comprised of farmers who were already organized in “Farmers Associations” in the scheme, in order to facilitate access to many farmers, places and information. The GWK division included Edwin Groeners, Hanke du Toit (the manager of the ORWUA) and Lala (communal property association) who is well versed in Afrikaans, which was used as the medium of communication in the surveys. Contact was also made with Mr Andrew Farmer, the head of the extension division within the Ministry of Agriculture and Rural Development in Kimberley. He is involved in the provision of extension services to land reform beneficiaries in the Northern Cape Province. Mr Farmer was, therefore, able to provide information and contacts, as well as names of the different land reform farms for survey.

3.6 METHODOLOGICAL ARRANGEMENT OF THE RESEARCH PROCESS

As shown in Figure 4 below, a specific methodological sequence was followed. The primary phase in the arrangement was to set up a list of questions to be included in the questionnaire. The study area was selected in respect of identifying the existing types of farmers in the area and their relationship with GWK in terms of agricultural empowerment of farmers. Maps showing different plots and their exact locations were provided by Orange-Riet Water User Association (ORWUA) and GWK. This helped with the identification of farmers to be interviewed.

The second phase in the methodological arrangement was the assembling of data from the 150 farmers. These interviews were conducted with the assistance of wives or children who were involved in the management of the farm. In the case of land reform beneficiaries, it was impossible to interview all at once, which is the reason why it took four months for all the 150 farmers to be interviewed (including some GWK representatives). Fortunately, all respondents were very cooperative during the interview process. The third phase in the methodological arrangement was the data analysis.

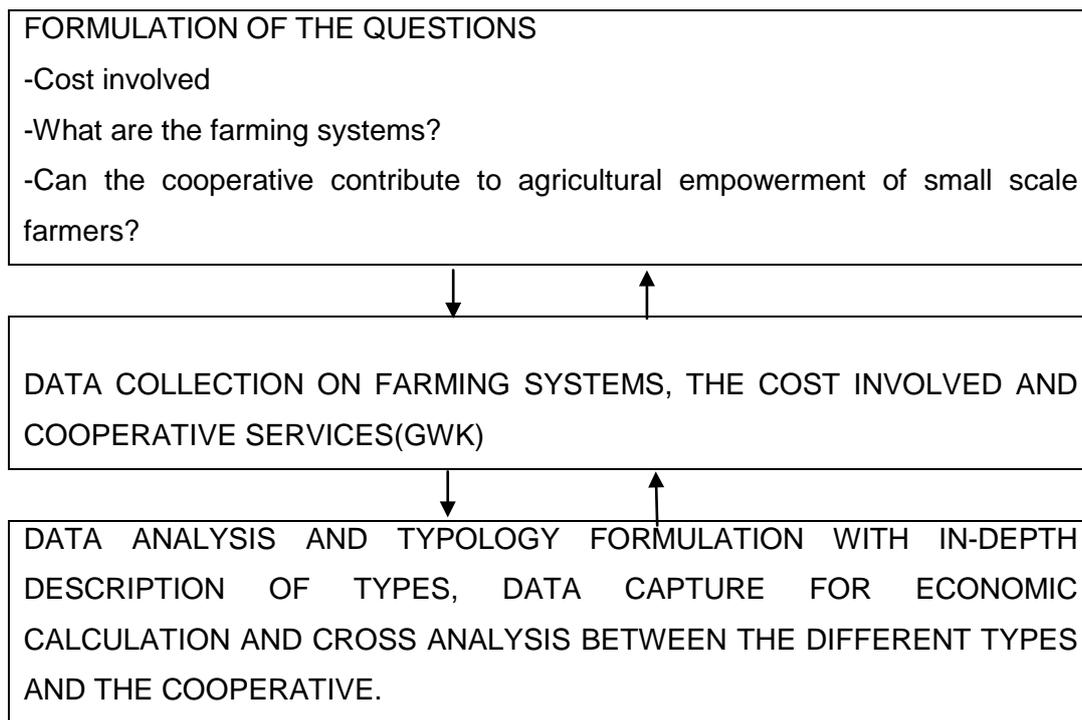


Figure 4: Methodological arrangement of the research process

3.7 CONSTRAINTS IN THE PROCESS OF DATA COLLECTION

Interpretation of the questionnaires revealed multiple limitations of the data collection. Certain questions were not easily translatable from English into Afrikaans. This made it necessary to enlist the help of a research assistant who was well versed in Afrikaans and able to translate for the main survey. Leading questions were observed, especially where a priori assumptions had been made. The wording of certain questions was uncertain and at times confusing to the respondents and this illustrated the need for the research assistant to recapitulate the question in a way clearly understood by the respondent. Some of the farmers were found not to be available on farm for questioning, and appointments were made to conduct the interview process in their own houses. At the end of the day, other interviews were found to have certain deficiencies in the data and this was time consuming in that the same farmer had to be interviewed twice to totally complete the interview for typology analysis.

3.8 ANALYSIS OF FARMING SYSTEMS

This research addresses the need to first of all analyse different farming systems and then to represent them for further typology purposes. A farmers' typology was created on the basis of a typology of farming activities.

Typology can be defined as an endeavour to group activity units according to their main modes of operation and their common characteristics (Anseeuw, 2011). The decision makers at the local and regional level can be given an image of local agricultural activities through typology (Perret, 1999). While typology can serve as a guideline for development purposes, it seeks to constitute a range of types that simplify reality while accounting for the main particularities which allow for the classification and analysis of each type in a collection to be studied (Perrot & Landais, 1993).

The method selected for this purpose is very important, as the analysis of all socio-economic components is an essential first phase in building a diagnosis. A representation of the diversity of farming systems can be recommended as an outcome, but also as the starting point for future studies. It is important to mention some of the limitations of typology, for instance it is clear that the results are valid for only a few years. It can also be understood that there is diversity in each and every type identified through typology.

Lastly, it is important to emphasize that any typology remains relative and subject to question. From the same sample and the same questionnaire, different typologies may be constructed, depending on the objectives, viewpoints or prospects of the surveyors (Perrot & Landais, 1993).

3.9 TYPOLOGY CONSTRUCTION

The construction of the typology takes place through sampling, a survey, interviews and data analysis. The typology of the Riet River Irrigation Scheme was set up with the objectives of identifying different types of farmers within the scheme and the land surrounding the scheme (dry land). The procedure was as follows:

Firstly, a survey was undertaken to provide a general description of farming activities and plots within the irrigation scheme and its surrounding areas, after which the data were processed and the results calculated.

Secondly, the survey was conducted by means of questionnaires administered to 150 farmers out of the 200 in our study area, operating within the scheme and its dry land. The variables used were chosen through observations from the existing data according to the diversity of farming activities in the area. Variables, such as off-farm activities, source of income, and farming activities, were technically related. As a result, the farming types were formed and developed until an exact classification of well-defined typology was completed.

3.10 DATA ANALYSIS

Although quantitative analysis methods are applied in Chapter 4, to a greater extent the analysis in this study is qualitative. Qualitative research methods seek to study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meaning people bring to them. The goal of qualitative research is to develop an understanding of social or human problems from multiple perspectives (Greenhalgh & Taylor, 1997). The analysis of qualitative data was organized around six processes:

- Transcribing the interview: the interviews were written in a copybook to allow the interview data to be formatted into a usable form and being read repeatedly as it is being transcribed.
- Preliminary exploratory analysis: in this process the data was explored in order to become familiar with the interview information. The transcripts were read multiple times, and themes began to emerge from the data. Sections of the transcripts that reflect a theme are identified.
- Making connections to the research questions: this step involved describing and further developing the themes from the data to answer the major research questions.
- Create a coding scheme and coding the data: the coding scheme was create to best define the themes that were identified and provided a way to break up the data for the analysis in Chapter 4.
- Inter-rater reliability: while working as a research team, the data was reviewed by the other group members as well. Each person reviewed the transcript and used the coding scheme to code the data. Results were then shared and discrepancies discussed and resolved.
- Interpret findings: after coding all the interview data, the data was divided into themes. The data was then reviewed within the themes or categories, and an understanding of each theme was reached.

A literature review was carried out in order to verify some of the observations derived from policy analysis. In chapter four both quantitative and qualitative analyses are used. Quantitative analysis

involves descriptive analysis for the status of productivity among farmers, whereas qualitative analysis interrogates the results of the field surveyed. The management of graphs appearing in chapter four was made possible through the application of SPSS STATISTICS. SPSS is a software package used for data documentation, statistical analysis and data management. A cross-analysis method was used to analyse the different services provided by GWK to farmers for each of the identified types.

Quantitative analyses are employed in Chapter four, where the descriptive and income profiles of the farmers belonging to the same type are considered, using simple economic tools such as net added value, net added value per worker, net added value per hectare, and farming income per worker.

3.11 CONCLUSION

The application of multiple methodologies has contributed in addressing the objectives and the problem statement of the study. The formulation of different farming types described was made possible through the typology analysis. The conclusion and recommendation were drawn from the outcome of this study. The types obtained were proved and confirmed within the typology study. The following chapter focuses on the results with regard to the main production of farmers, their gross incomes, net added values, farming income, main sources of income and activities. Lastly, the chapter analyses the GWK's contribution for each of the identified types, followed by the conclusion.

CHAPTER 4

RESULTS AND ANALYSIS

This chapter presents the major results and discussions of the study. Using the technics discussed in the preceding chapter, a first result consists of the development of a typology of farming systems, presenting the diversity of farm households, their strategies and activities. A second result is the analysis of the contribution of a local cooperative to the Riet River Irrigation Scheme farmers. This will be done in accordance to the typology. This chapter is structured in three parts. The first presents the broader characteristics of the irrigation scheme and farmers. The second expands on the typology of the different farming systems identified. The third focuses on the contribution of GWK to farmers' typology, followed by the conclusion.

4.1 MAIN CHARACTERISTICS OF THE IRRIGATION SCHEME FARMERS

This section reveals the characteristics of the irrigation scheme as a whole, facilitating an overall description of our research area and farming population. This will lead to a better understanding of the broader dynamics of the scheme. Indeed, while it is the objective to better understand the diversity of farmers within this scheme, the different types of farmers cannot be analysed in isolation from each other, nor from their broader environment.

4.1.1 Land ownership

The important part of the land is privately owned by large-scale farmers, who are mostly white people (79.3 %). Three aspects are to be highlighted here; firstly, this situation has generated mainly from South Africa's apartheid legacy. It is particularly related to the fact that land was attributed to Italian prisoners of the Second World War who had been brought to South Africa, as a reward for constructing the irrigation scheme, as detailed in the methodology section. As with most land in the Northern Cape and Free State Province, further devolution of land ownership has mainly been through family inheritance. The same families still own the lands that have been in their families' possession for up to five generations. Secondly, the implementation of Land Reform programmes by the government to empower the previously disadvantaged people of the apartheid regime has been rather slow. In the Riet River Irrigation scheme, only four farms had been redistributed, covering only 3,17 % of the total area. Thirdly, private land transactions are taking place between the same ethnic groups (white-white, black-black). Thus, despite the government's

efforts with different land reform programmes to address South Africa's land issues, the majority of land is still owned by white people.

In addition, the municipality owns vast tracts of commonage, which have been acquired over the years since the 1800s. New commonages were purchased by the Department of Land Affairs after 1994, for the use of emergent farmers, and three commonages are present in the scheme.

Table 3: Land ownership structure of the area

TYPE OF LAND REFORM	No OF FARMS	No OF FARMERS	RACE	GENDER	% OF FARMERS
SLAG	2	9	Black	Male, female	6
LRAD	0	-	-	-	-
PLAS	2	8	Black	Male	5.34
MUNICIPAL LAND	3	14	Black	Male, female	9.33
PRIVATE OWNED LAND	119	119	White	Male	79.33
TOTAL	126	150			100

4.1.2. Land use

About 1 045 ha (4, 34 %) are under irrigation and used for crop production. Nearly 15 970 ha (66.4 %) of agricultural land is used for extensive livestock farming. Agricultural activities range from intensive crop production, mixed farming, cattle ranching, sheep breeding, dairy farming to game farming.

Table 4: Land size and land use structure.

Category of Land	Number of Ha	Land use (ha)	%/category	%/ha
Pasture	22770	15970	70.14	66.40
Irrigation	1282	1045	81.5	4.34
Total	24052	17015	151.64	70.74

4.1.3 Labour and activities

The farming activities (livestock breeding, soil preparation, seedling, irrigation, etc.) are mostly done by men (90 %) for cultural reasons. The activities on farm consist of manual and machinery work, often carried out by the farm workforce and the farmer using heavy implements (tractors, planters, and fertilizer machines, etc.). The farmer population is rather old, with mostly older individuals working the land and engaging in farming activities. Indeed, more than 40 % of the farmers are part of the 60+ age group.

Table 5: Age structure of farmers in the Riet River Irrigation Scheme and its dry land.

Age category	Frequency	Percentage of farmers
20-30	8	5%
30-50	52	35%
50-60	30	20%
>60	60	40%
Total	150	100%

The farm structures can be defined as “patronal”, with farmers relying heavily on farm labour. The farm workforce is mostly composed of hired labour, with most of the work being seasonal, and the farm holders only intervene during soil preparation and harvesting periods. Irrigation combined with livestock farms are more labour intensive (72.72 %), resulting in a higher workforce than irrigation (19.20 %) and livestock farms (8.08 %).

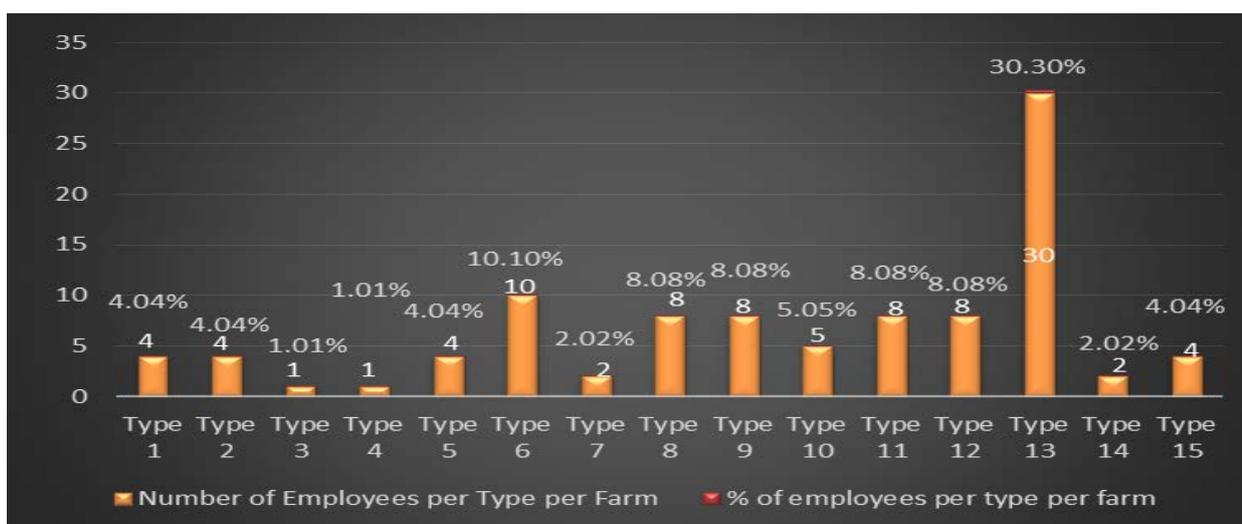


Figure 5: Farm workforce (irrigation, irrigation + livestock and livestock farmers) in the scheme and its dry land.

It is important to specify that while men mainly work on the farm, women are largely involved in some off-farm activities.



Figure 6: Number of males and females owning the land, number of males and females working the land (full time and part time).

The majority of farms in the Riet River Irrigation Scheme are privately owned and worked by men compared to women (Figure 6). This situation has its roots in the prevailing culture, which has historically dictated that land ownership is reserved exclusively for men.

4.1.4 Diverse sources of income and activities

The majority of farmers operating in the area rely on farming for their living (75.3 %). While large-scale farmers are mostly dependent on agriculture for the household income, land reform beneficiaries and smallholder farmers are mostly involved in off-farm activities for their households' income and live on it.

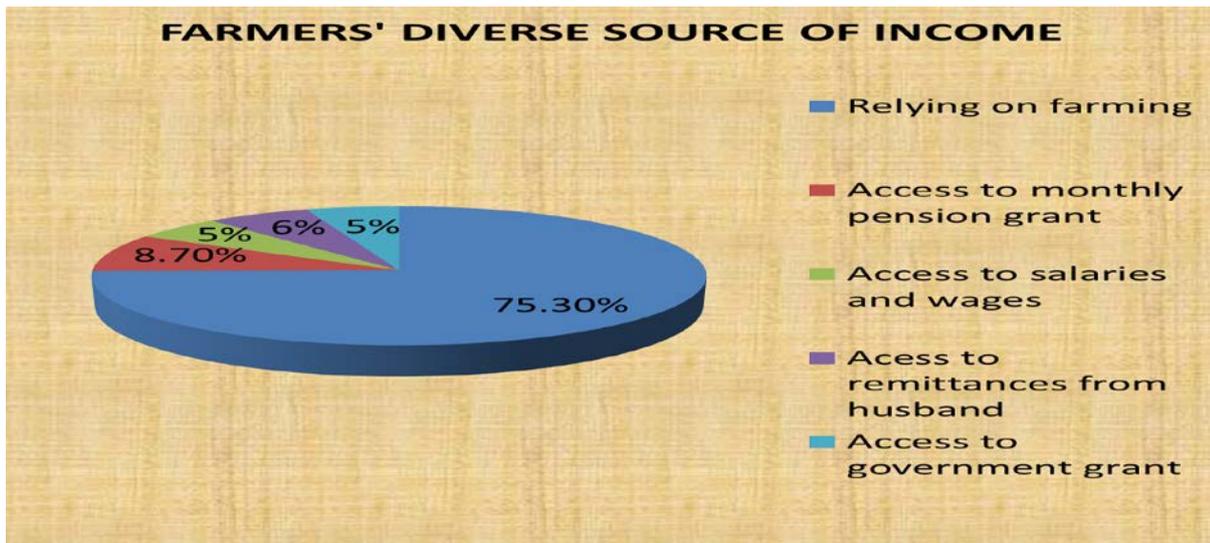


Figure 7: Farmers' diverse source of income in the Riet River Irrigation Scheme and its dry land

It is clear from the above that the Riet River Irrigation Scheme farmers show huge diversity. This does not only concern their activities, but also their income, strategies, household structures, and the like. Diverse off-farm strategies and farming systems help the smallholder farmers and land reform beneficiaries to secure the maximum income possible for their households. Without such off-farm activities, these farmers would not be able to support their households, since the income earned through smallholder production is not sufficient. A more disaggregated analysis according to types will facilitate an understanding of this diversity.

4.2 TYPOLOGY OF FARMERS ACCORDING TO DIFFERENT FARMING SYSTEMS

It is evident from the above overall information that important diversity exists between the farmers. As such, the next section describes the different types of farming systems identified in the Riet River Irrigation Scheme and its dry land, aiming at a better understanding of the differences between farmers, their activities, and strategies.

Table 6: Farmers' major characteristics in the irrigation scheme and its dry land.

Farmers' major characteristics	Old age pension(R)	No of employees	No of farmers	Remittances(R)	Crop farming(ha)	No of Stock	Farming income (R)	Other sources (R)	Pasture (ha)	Total land (ha)	Infrastructure & implements	Land tenure
Type1	0	4	9	0	30	84	0	0	230	260	Gvt poor	No
Type2	0	4	8	0	40	120	312849	738065	0	40	Pvt poor	No
Type3	14400	1	5	0	0	120	7500	0	300	300	Munpty poor	No
Type4	0	1	9	96000	0	109	33060	0	200	200	Munpty poor	No
Type5	0	4	19	0	120	0	845000	0	0	120	Pvt good	Yes
Type6	0	10	15	0	100	0	921000	0	0	100	Pvt good	Yes
Type7	0	2	8	0	10	8	440000	0	0	10	Pvt poor	Yes
Type8	0	8	10	0	120	200	1450000	0	0	120	Pvt good	Yes
Type9	0	8	10	0	120	1112	859000	0	40	160	Pvt good	Yes
Type10	0	5	16	0	100	0	1509000	0	0	100	Pvt good	Yes
Type11	0	8	7	0	45	220	390000	0	0	45	Pvt good	Yes
Type12	0	8	10	0	160	1250	1202000	0	3000	3160	Pvt good	Yes
Type13	0	30	6	0	200	150	2280417	0	3400	3600	Pvt good	Yes
Type14	0	2	8	0	0	270	319000	0	2800	2800	Pvt poor	Yes

Type15	0	4	10	0	0	100	202900	0	6000	600	Pvt	yes
							0			0	poor	
Total	1440	99	150	960	10	3743	125978	738	1597	170		
	0			00	45		26	065	0	15		

4.2.1 Type 1: Land Reform beneficiaries with irrigation (SLAG PROGRAMME) (9/150 6%).

This type is composed of one group of nine farmers who acquired land (2 farms) through the SLAG Land Reform programme. A community property association (CPA) was established by the group to get access to the land and, subsequently, to financial support from the government. It is important to specify that these farms were previously owned by a white commercial farmer, but presently accommodate nine black families (on average, 260 ha per family). These farmers have a mentor, who is usually a large-scale commercial farmer appointed and recognized by GWK, or by the Department of Agriculture, for assisting with the skills development of smallholder farmers or land reform beneficiaries.

The farming activities of these are all related to animal husbandry (cattle, small stock, and piggeries). Lucerne is produced in order to supplement animal feeding, particularly during the dry winter months. They hold an average of 260 ha, of which they use, on average, 12 % (30 ha) for lucerne, yielding an estimated 2.5 tonnes per hectare. Pig breeding is also much valued because of the capacity of pigs to produce many piglets in a season. It was observed that these farmers at all times seem to be less engaged in irrigation, although the lucerne produced enables them to feed their livestock.

4.2.2 Type 2: Family beneficiaries of the land reform with irrigation (PLAS programme) (8/150-5%).

This type is composed of eight farmers, who acquired land (2 farms) through the PLAS Land Reform programme. These farmers lack a mentor, but benefit from different government subsidies, including the RECAP programme, to allow them to increase their farming production, guarantee food security, and graduate to commercial farmers. It is important to mention that the farming activity is carried individually.

The farming activities of these farmers are all related to crop production (lucerne, maize and wheat) and animal husbandry (small stock). They have an average of 40 ha, of which they use, on average, 40 % (16 ha) for lucerne, 30 % (12 ha) for wheat, and 30 % (12 ha) for maize, yielding an estimated 13 tons per hectare of maize, 7 tons per hectare of wheat, and 2.5 tons per hectare of lucerne. Sheep breeding in feedlots is also carried out as an additional activity to the irrigation, although this area of operation is too small for making a living.

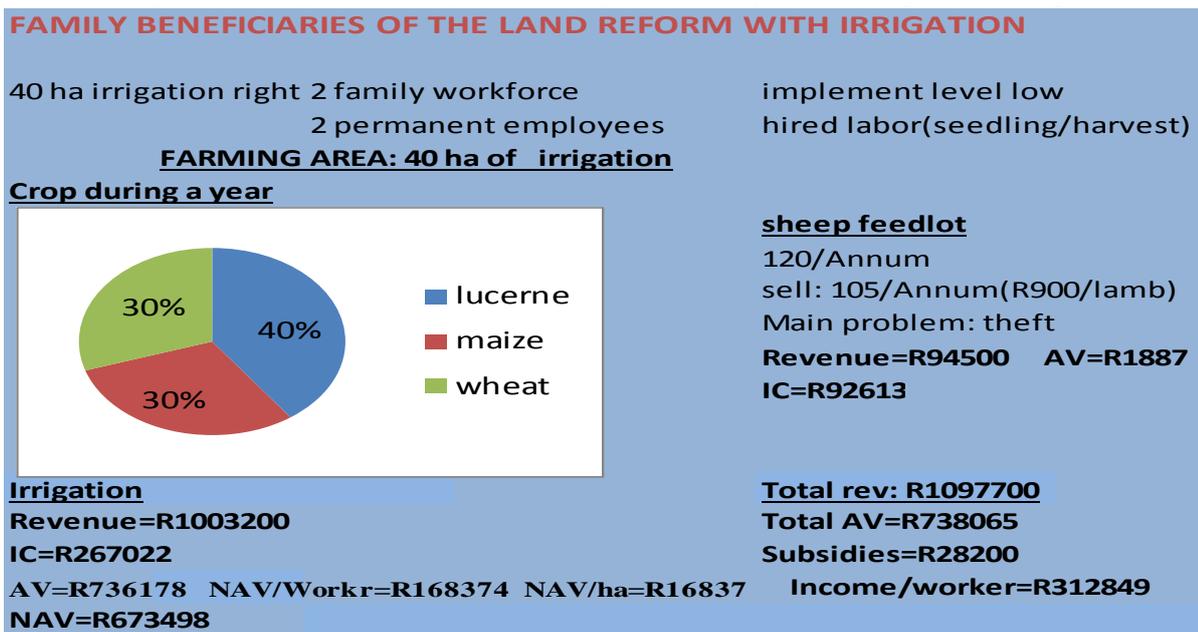


Figure 9: Type 2: Family beneficiary of the Land Reform with irrigation

The production cost incurred (R359 635, on average) is inferior to the total revenue (R1 097 700, on average), thus yielding a low income (R312 849, on average, per farmer per annum). The subsidies from the Department of Agriculture (R28 200) can be reinvested to increase their revenue. As a result, these farmers derive a large proportion of their income from on-farm activities.

The major issue is the low farming net revenue of their farm activities. Considering the small irrigated area (40 ha), a larger portion of land could increase their farm activities and so increase their revenue. In addition, the sheep farmers face serious problems of theft, which discourage them from increasing the numbers of livestock. They also have less-developed infrastructure because they can only partially afford it (with their low farming income).

4.2.3 Type 3: Smallholder farmers rearing livestock on municipal land (5/150-3%).

This type is composed of five farmers (all retired) who farm on municipal land or commonage. This commonage is administered by the Koffiefontein Municipality. These farmers have a mentor who generally, as defined earlier, is a large-scale commercial farmer appointed and recognized by GWK or by the Department of Agriculture for assisting with the skills development of smallholder farmers or land reform beneficiaries.

The farming activities of these are all related to animal husbandry (cattle and small stock). They have one camp of 300 ha, on which they collectively breed 94 sheep and 32 cattle. They supplement their livestock feeding with pellet food, particularly during winter months when pasture becomes scarce.

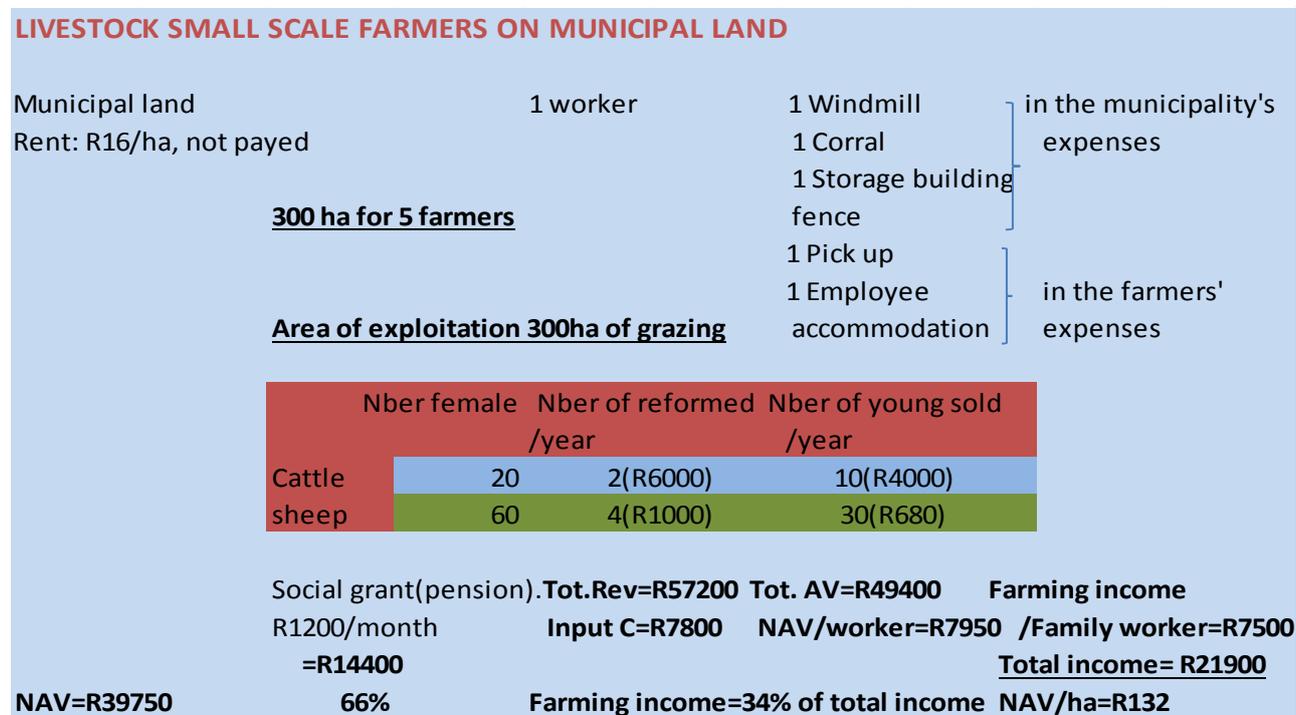


Figure 10: Type 3: Livestock small scale farmers on municipal land.

The production cost incurred (R7 800) is less than the total revenue (R57 200, on average), thus yielding low farming income 34 % (R7 500, on average, per farmer per annum). Consequently, these farmers derive a large proportion of their income (66 %) from social grants (R14 400, on average, per annum).

The major issue is the low farming net revenue of their farm activities. The farm size is too small and these farmers lack possibilities for expanding their stock, as the number of animals is restricted by the municipality to prevent problems of overgrazing. The lack of quality land and financial and technical support from the Department of Agriculture and Rural Development or GWK, hinders the incorporation of irrigation farming in their farm activities. They have less-developed infrastructure because they are unable to afford it, with consequently, most of it is supplied by the municipality. In addition, theft combined with predation frequently occurs because of the poor condition of the commonage (no fence, windmill not working, unsafe storage room, etc.). Similarly, the services provided by the mentor are of poor quality and are not contributing to the farmers' skills development.

4.2.4 Type 4: Women farmers rearing livestock on municipal land (Kimberley municipality) (9/150-6%).

This type is composed of nine farmers who farm on municipal land (commonage). The commonage was given to the township population in 1998 to limit various forms of grazing on residential areas or schoolyards. This commonage falls under the Kimberley Municipality and has four camps of 450 ha each. These camps are supervised by one farmer with experience in farming. It was observed that these farmers can, through private arrangement, incorporate other farmers in the commonage. They have a mentor who, generally, is a large-scale commercial farmer appointed and recognized by GWK or by the Department of Agriculture for assisting with skills development of smallholder farmers or land reform beneficiaries.

The farming activities of these farmers are all related to animal husbandry (cattle and small stock). They have each an average of 200 ha, on which they breed 39 sheep, 55 goats and 15 cattle.

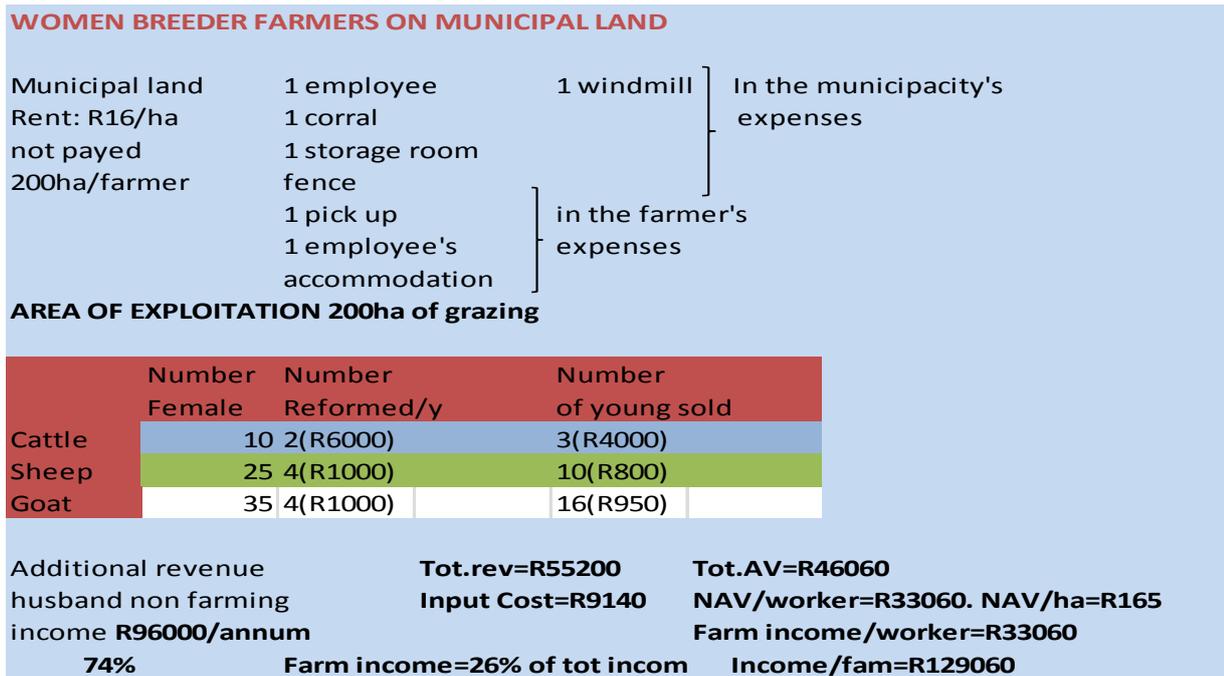


Figure 11: Type 4: Women breeder farmers on municipal land

The production cost incurred (R9 140, on average) is less than the total revenue (R55 200, on average), thus yielding low income (R33 060, on average, per annum) or 25.61 % of the total income. Consequently, these farmers derive a large proportion of their income (74 %) from off-farm activities (R96 000 on average, from husbands' salaries).

The major issue is the low net revenue of their farm activities. The farm size is too small and these farmers lack possibilities for increasing their stock as the number of animals is restricted by the municipality to prevent problems of overgrazing. The lack of quality land and financial and technical support from the Department of Agriculture and Rural Development or GWK, hinders the development of their farm activities and improvement in their revenue. They have less-developed infrastructure because they are unable to afford it, and consequently most of it is supplied by the municipality. Furthermore, predation and theft problems often occur because of the poor condition of the commonage (no fence, windmill not working, unsafe storage room, etc.). Also, the services provided by the mentor are of poor quality and are not contributing to their skills development.

4.2.5 Type 5: Cereal (maize/wheat) farmers under pivot irrigation (19/150-12.7%).

This type is composed of nineteen farmers who farm on privately owned land. These farmers have a contract with GWK to access production services (input cost, training, marketing, etc.) throughout the year.

The farming activities of these are all related to crop production (lucerne, wheat, late maize and barley). They have an average of 160 ha, of which they use, on average, 62.5 % (100 ha) for maize, 18.75 % (30ha) for wheat, 18.75 % (30 ha) for barley and 12.5 % (20 ha) for lucerne, yielding an estimated 14 tonnes per hectare of maize, 8 tonnes per hectare of wheat, 3 tonnes per hectare of lucerne and 8.5 tonnes per hectare of barley. With the inflation of input costs, these farmers hope extend in size to produce more; and they mostly specialized in maize and wheat to maximize the return on the expensive implements. The lucerne and barley crops are planted mostly in corners not covered by the pivots and are irrigated with sprinklers. This strategy of farming has been adopted by these farmers to diversify their farm activities and improve their revenue. In addition, they have developed infrastructure because they can afford it, consequently with most of it being supplied by the farmer.

CEREAL FARMERS MAIZE,WHEAT UNDER PIVOT

Irrigated area
80-160ha

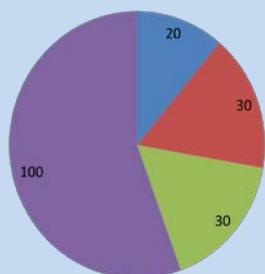
1 family worker
4 permanent employees

Combined harvester
2 Planter,disc
lucerne implement
Irrigation syst(1pump/pivot)
2-4 pivots(150ha) sprinklers(50ha)
GWK production loan:300000/annum of interest
Direct seedling of maize in wheat
lucerne in angles not covered by pivots
Rotation:(Maize/wheat)3 years/barley
Maize:13-14t/ha,R1600/t,cost 14200/ha
wheat:7-8t/ha,R2000/t,cost R12500/ha
Market to GWK,SAFEX price-R300/t

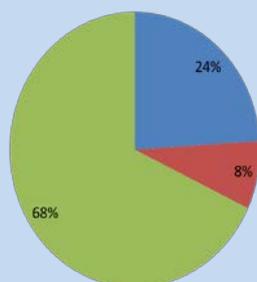
EXPLOITATION AREA:120ha of crop

Area crop repartition

NAV repartition



■ Lucerne
■ Wheat
■ Barley
■ Late maize



■ interest
■ salaries
■ Farming R

Tot. rev=R4350000

Tot. AV=R1516000

Input Cost=R2834000

NAV=R1245000

NAV/worker=R250000 NAV/ha=R10000 Income/family worker=R845000

Figure 12: Type 5: Cereal farmers maize, wheat under pivot

The production cost incurred (R2 834 000, on average) is inferior to the total revenue (R4 350 000, on average), thus yielding a positive income (R845 000, on average, per farmer per annum). Consequently, these farmers generate the maximum of their income from farm activities.

The major issue is the access to farming water, which is becoming an increasing problem because water rights cannot presently be allocated to white farmers. Thus, they buy in water from the neighbouring emerging farmers (black) who have available farming water, but at an expensive

price (R1 200/ha of water). In addition, the interest rate paid by these farmers remains high (24 % of the total loan).

4.2.6 Type 6: Lucerne producers with an extra agricultural activity linked to the production (buy-sell, implements rental) (15/150-10%).

This type is composed of fifteen farmers who farm on privately owned land. These farmers are not under contract with GWK for their production services (input cost, training, market, etc.) because the lucerne they produce enables them to cover their production costs throughout the year.

The farming activities of these farmers are all related to crop production (lucerne and maize). They hold an average of 130 ha, of which they use, on average, 63 % (83 ha) for lucerne and 13 % (17 ha) for late maize, yielding an estimated 20 tonnes per hectare per annum of lucerne and 14 tonnes per hectare of maize. It is important to specify that the lucerne is highly valued by these farmers because of its high annual productivity and good market price (R1 200/ton in summer and R1 500 in winter) and because of the fact that it can be marketed in various forms (as food for local livestock, exported or converted to pellets). These farmers have built storehouses to stock the lucerne and they market in winter when the price has increased. However, lucerne is a labour-intensive crop that requires many days of labour per month, during seven to eight months of the year. In addition, these farmers also have good infrastructure because they can afford it and consequently, most of it is supplied by the farmers themselves.

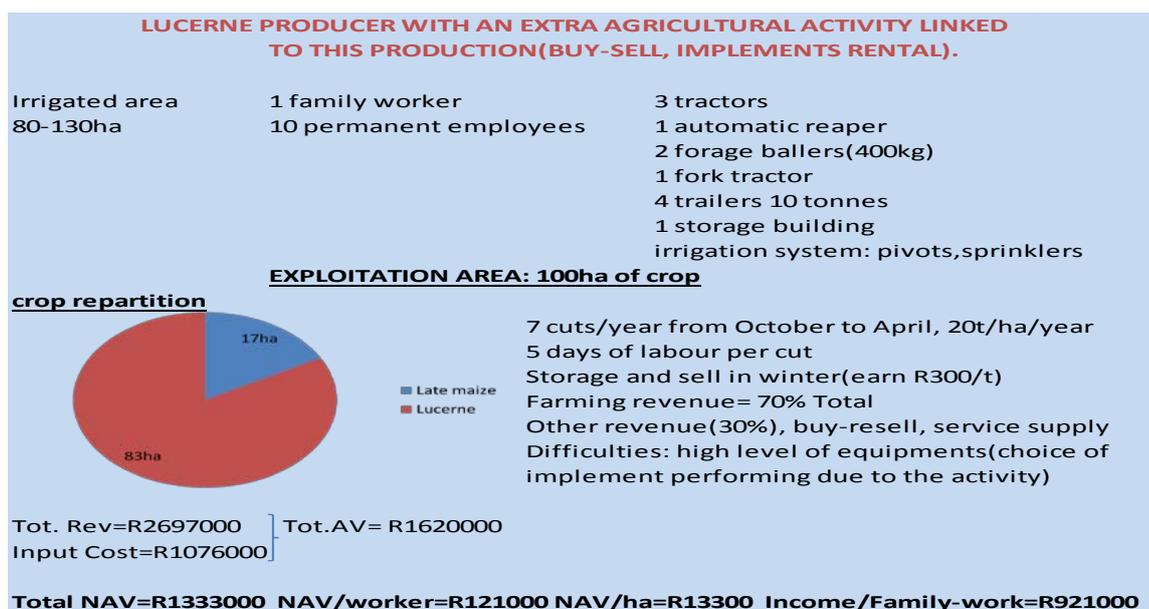


Figure 13: Type 6: Lucerne producer with an extra agricultural activity linked to the production (buy-sell, implements rental).

The production cost incurred (R1 076 000, on average) is less than the total revenue (R2 697 000, on average, per annum), thus yielding significant income (R921 000, on average, per farmer per annum). Consequently, these farmers derive a large proportion of their income from farm activities (70 %). They also diversify their sources of income by renting out different services (implements) to other lucerne farmers, and by buying and reselling lucerne at good prices to increase their income (30 % of the total income comes from this extra activity).

The major issue is that lucerne is a risky and perishable crop in case of heavy rains (the degradation and loss in quantity are very important). These farmers hold high inventories of implements which are expensive. Thus, any difficulties in using some of the implements in rendering services, and some of these implements are not reasonably compatible for certain services (e.g. a large lucerne harvester will consume large quantities of fuel while harvesting 3 ha of lucerne), will constitute a liability. Also, lucerne requires significant quantities of water but these farmers (white) do not have rights to obtain new water rights as the available water rights are exclusively reserved for black farmers. Thus, they buy in water from neighbouring emerging farmers (black) to fully irrigate their crop, but at an expensive price (R1 200/ha of water).

4.2.7 Type 7: Small lucerne producers, pensioners or part-time (8/150-5%).

This type is composed of eight farmers who farm on privately owned land. These farmers are not under contract with GWK for input costs and marketing but do receive some of the services provided to emerging farmers (training, organizational structure, pest control, etc.).

The farming activities of these farmers are all related to crop production (lucerne) and animal husbandry (cattle). A part of the lucerne produced (12 %) is used to supplement animal feeding, particularly during winter months. They hold an average of 12 ha, of which they use, on average, 75 % (9 ha) for lucerne and 8.3 % (1 ha) for pasture, yielding an estimated 20 tonnes of lucerne per hectare per annum. The farming land is mostly backyard, with 8 cattle in feedlots, and the lucerne is planted in winter and irrigated through flooding.

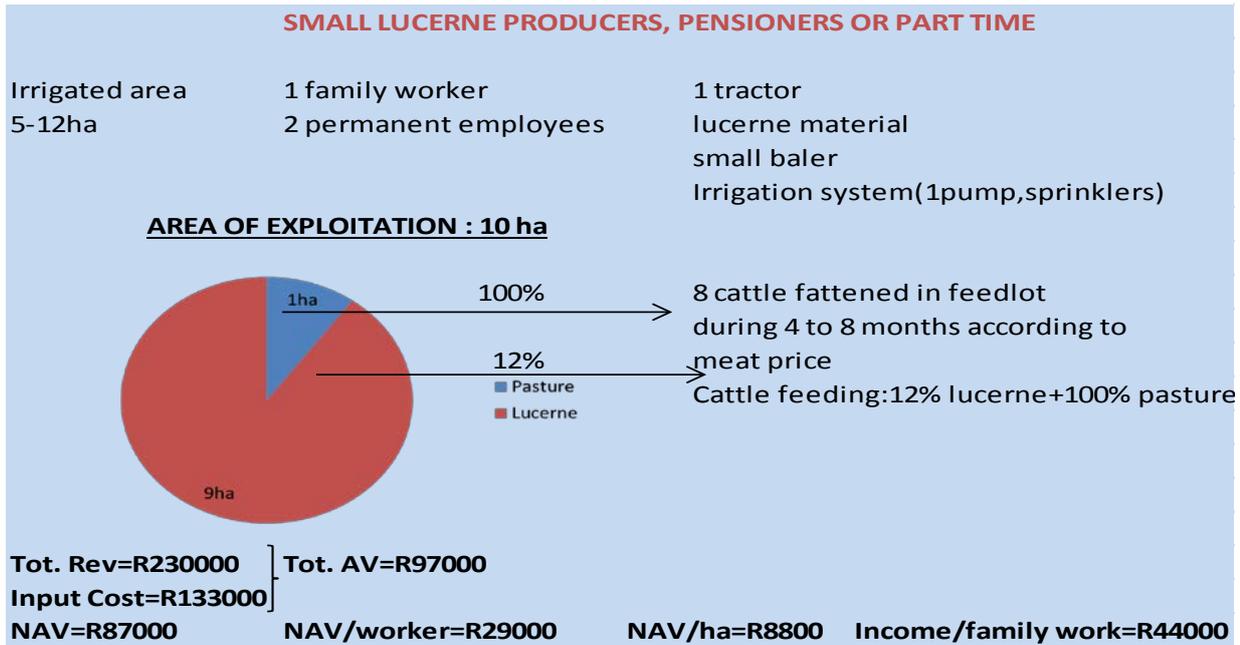


Figure 14: Type 7: Small lucerne producers, pensioners or part-time.

The production cost incurred (R133 000, on average) is less than the total revenue (R230 000, on average), thus yielding low income (R44 000, on average, per farmer per annum). Consequently, these farmers derive a large proportion of their income from off-farm activities (social grants and salaries).

The major issue is the low net revenue of their farm activities. The lack of large-scale irrigable land and financial support from the Department of Agriculture and Rural Development or GWK, hinders the increasing of lucerne production. They also have less-developed infrastructure because they are unable to afford it, consequently most of it is supplied by the farmer and it is depreciating. Also, the services provided by GWK are of poor quality and are not contributing to the farmers' skills development.

4.2.8 Type 8: Farmers adapting to the market with risks minimisation across cereals production, lucerne, peanuts and cattle fattening (10/150-7%).

This type is composed of ten farmers who farm on privately owned land. They are under contract with GWK for their production services (input cost, training, market, etc.) to entirely manage the farming throughout the year.

The farming activities of these are all related to crop production (peanuts, lucerne, maize and wheat) and animal husbandry (cattle). A part of the lucerne (6 %) and maize (15 %) crops and the

peanut straw are all used to supplement cattle feeding, particularly during the dry winter months. They hold an average of 140 ha, of which they use, on average, 42.8 % (60 ha) for wheat, 42.8 % (60 ha) for lucerne, 32.3 % (48 ha) for maize, and 8.6 % (12 ha) for peanuts, yielding an estimated 8 tonnes per hectare of wheat, 2.5 tonnes per hectare of lucerne, 15 tonnes per hectare of maize and 4 tonnes per hectare of peanuts. They also keep 200 cattle in feedlots.

These farmers have diversified their farm activities to minimize risk in case of the non-profitability of certain farm commodities. This strategy has been adopted by these farmers owing to the fact that since 1990 the input price of maize has inflated, compared to the local market price of maize. This situation was created by the liberalization of the price of maize, worldwide. Maize has become an uncertain product owing to the excessive fluctuation of the market price. A considerable number of farm products which depend on maize have been affected by the unstable price (e.g. beef). Consequently, these farmers have diversified their farm activities (maize, wheat, lucerne, peanuts and cattle fattening) for risk management purposes. As such, when the maize price declines, farmers increase the number of livestock fed with a part of the maize produced, and when prices increase, maize is sold off and they fatten a smaller number of livestock. The same strategy is applied when it comes to lucerne and peanut products. The peanut straw is supplemented in livestock feeding during winter months. The straw, combined with some remaining peanut grains, is nutritionally rich for cattle. In addition, these farmers have good infrastructure because they are able to afford it, and consequently most of it is supplied by the farmers themselves.

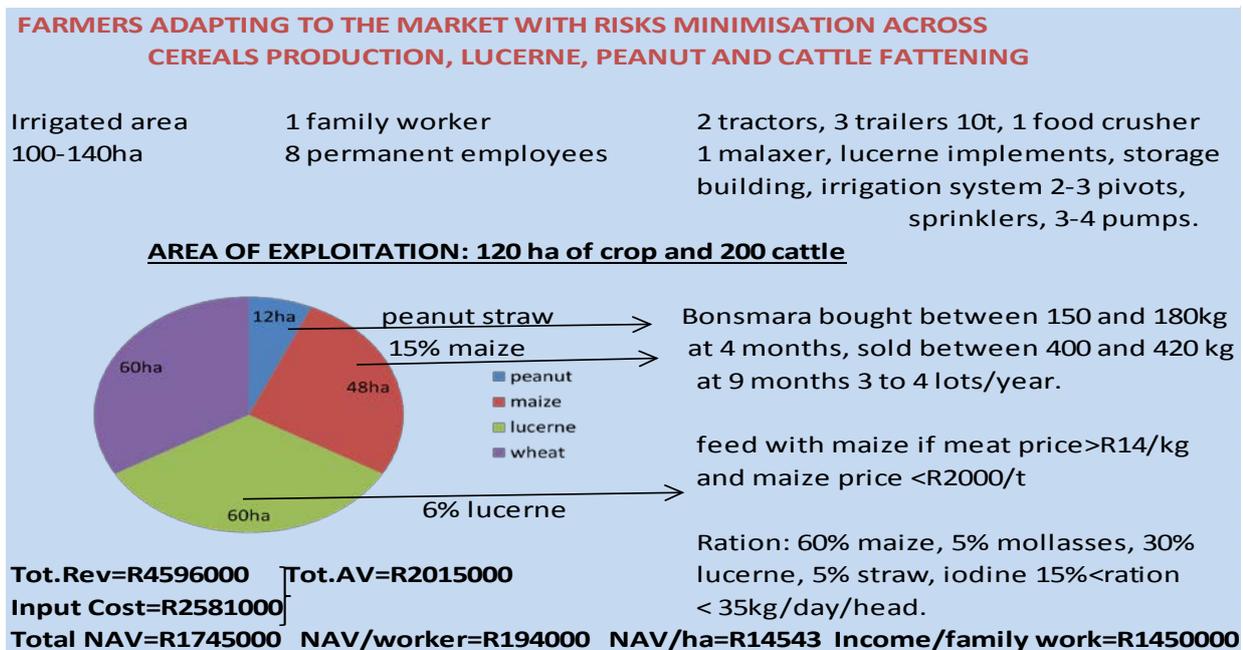


Figure 15: Type 8: Farmers adapting to the market with risk minimisation across cereals production, lucerne, peanuts and cattle fattening.

The production cost incurred (R2 581 000, on average) is less than the total revenue (R4 596 000, on average), thus yielding a significant income (R1 450 000, on average, per farmer per annum). Accordingly, these farmers generate most of their income from farm activities.

The major issue is the high interest rate paid (24 % of the total loan) to GWK. They also do not have sufficient water rights as the acquisition of new water rights is presently prohibited for white farmers. The remaining water reserve in the scheme is intended exclusively for black farmers. This situation hinders the expansion of their irrigation activities and any consequent increased production.

4.2.9 Type 9: Merino sheep breeders (meat/wool) recently installed (10/150-7%).

This type is composed of ten farmers who farm on privately owned land. These farmers are under contract with GWK for their production services (input cost, marketing, training, etc.) to farm fully throughout the year.

The farming activities of these farmers are all related to animal husbandry (merino sheep) and crop production (maize and lucerne). The sheep are bred within the irrigation area. This practice is relatively recent (1990). Historically, the sheep were grazed on the natural grassland, but predation and problems of dryness occurring in the region had encouraged these farmers to intensively breed their animals in feedlots. They hold an average of 140 ha, of which they use, on average, 50 % (70 ha) for lucerne, 28.6 % (40 ha) for maize, and 28.6 % (40 ha) for oats (which is used to feed 100 ewes), yielding an estimated 2.3 tonnes per hectare of lucerne and 15 tonnes per hectare of maize. It is important to specify that 40 % of lucerne and 25 % of maize are used to supplement animal feeding, particularly during the dry winter months. However, the oats are reserved absolutely for sheep grazing throughout the year. Also, they have good infrastructure because they are able to afford it, and consequently most of it is supplied by the farmers.

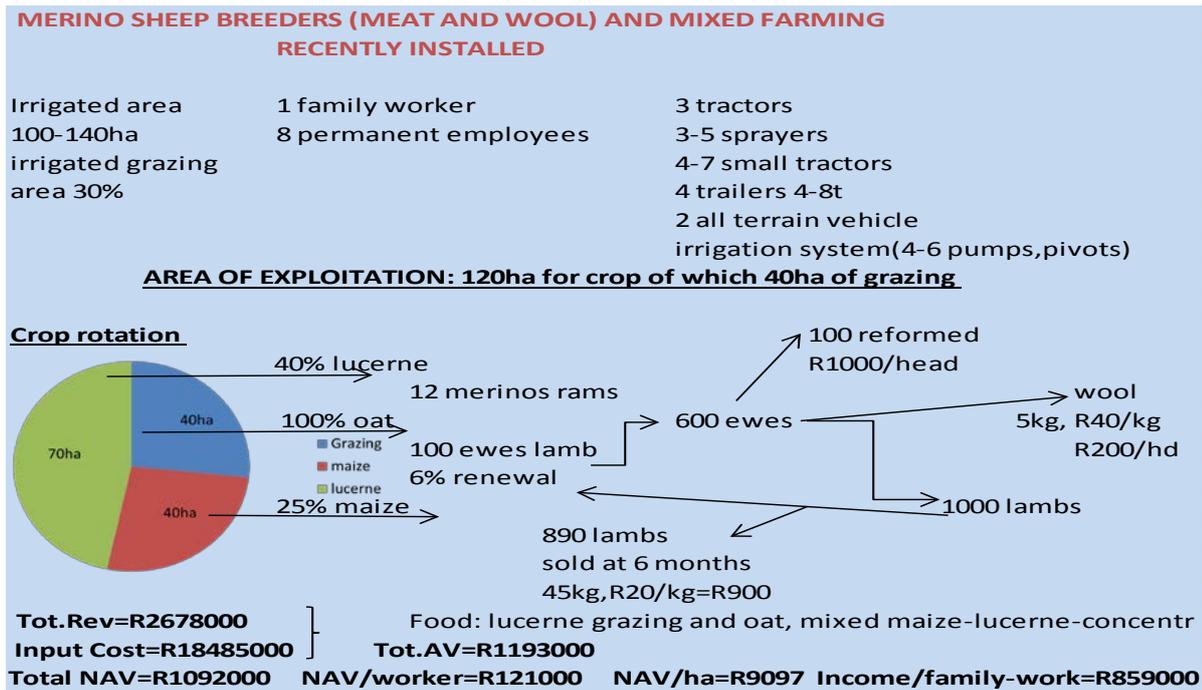


Figure 16: Type 9: Merino sheep breeders (meat/wool) recently installed.

The production cost incurred (R1 485 000, on average) is less than the total revenue (R2 678 000, on average, per annum), thus yielding positive income (R859 000, on average, per farmer per annum). Consequently, these farmers derive most of their income from farm activities. For instance, a sheep of 45 kg yields R20 per kg of meat, and 5 kg of wool per sheep, at R40 per kg of wool.

The major issue is that these farmers lose a fair number of sheep to thieves. The costs related to this practice of farming are much higher than grazing on natural grassland. However, this is compensated for by the speed of the fattening process for sheep in a feedlot, where sheep gain weight in record time for the meat market.

4.2.10 Type 10: Annual cereal farmers’ maize-wheat, producing pecan nuts in pivots’ corners (16/150-10.7%).

This type is composed of sixteen farmers who farm on privately owned land. These farmers are under contract with GWK for their production services (input cost, training, marketing, etc.) and to farm continuously throughout the year.

The farming activities of these farmers are all related to crop production (pecans, oats, wheat and maize). They hold an average of 150 ha, of which they use, on average, 53.3 % (80 ha) for maize,

40 % (60 ha) for wheat, 13.3 % (20 ha) for oats and 13.3 % (20 ha) for pecans, yielding an estimated 16 tonnes per hectare of maize, 8 tonnes per hectare of wheat, 4 tonnes per hectare of oats and 4 tonnes per hectare of pecan nuts. The pecan trees and oats are planted in pivot corners, mostly at the extremity of the irrigated surface where water does not reach. These areas (pivots corners) are irrigated through sprinklers for oats and micro jets for pecan trees. It is important to specify that the pecan trees were brought in from Mpumalanga. This pecan-mix farming was implemented in 1997, despite the differences in climate between the two regions (Mpumalanga and Northern Cape) but it has succeeded. In addition, these pecan trees consume less water and less fertilizer and are resistant to diseases (no pesticides, no fungicide, etc.). However, it requires several years (more than 7 years) to harvest the first nuts and the production starts becoming considerable in the 10th year, which is a reason why these farmers do not farm pecan nuts on large-scale, though it may be profitable. Also, they have good infrastructure because they are able to afford it, and consequently most of it is supplied by the farmers themselves.

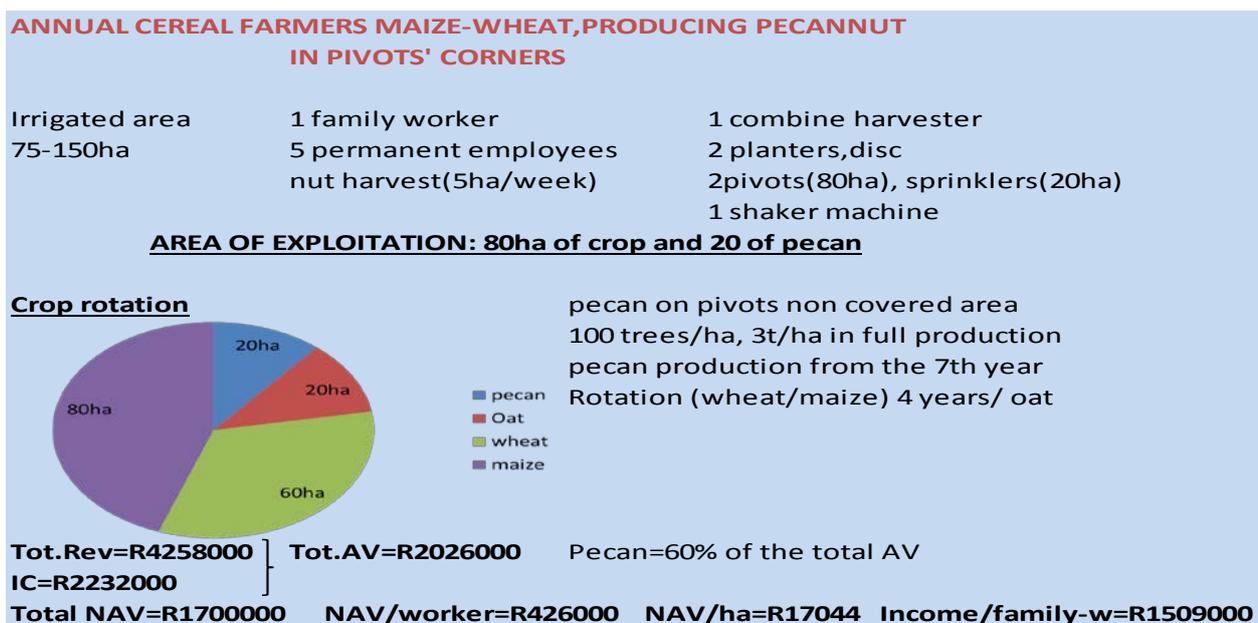


Figure 17: Type 10: Annual cereal farmers, maize-wheat, producing pecan nuts in pivot corners.

The production cost incurred (R2 232 000, on average) is inferior to the total revenue (R4 258 000, on average), thus yielding significant income (R1 509 000, on average, per farmer). It is important to emphasize that pecan nuts contribute 60 % to the total net revenue, but their production costs are shown to be low. Consequently, these farmers derive the most of their income from farming.

The major issue is that the interest rate paid by these farmers to GWK is high (24 % of the total loan). Furthermore, these farmers do not have sufficient water rights, as access to new water rights

is presently prohibited from being sold to white farmers. The remaining water reserve in the scheme is intended exclusively for black farmers. This situation hinders their capability for extending their farm activities.

4.2.11 Type 11: Dairy cattle farmers, in debt (7/150-5%).

This type is composed of seven farmers who farm on privately owned land. These farmers are not under contract with GWK for production costs because GWK is not involved in the milk business. However, they do receive some minimum services (training, organizational structure, motivation, skills development, etc.) provided as part of the monthly farmers' association meeting held by GWK. The dairy farming activity has existed since 1950 and because of the inflation in fuel prices and food transportation costs in the rest of South Africa's provinces, these farmers decided to settle permanently in the scheme where the fodder produced locally is affordable for their dairy cows. The milk price has been declining for a decade and the smaller dairy farmers have shut down their businesses. The farmers considered in this study are the remaining dairy farmers who have borrowed under loans to overcome the financial crisis and are presently in debt.

The farming activities of these farmers are all related to animal husbandry (dairy cows). Lucerne, oats and maize are produced in order to supplement animal feeding throughout the year. They hold an average of 60 ha, of which they use, on average, 33.3 % (20 ha) for maize, 33.3 % (20 ha) for lucerne and 8.3 % (5 ha) for oats (pasture). They use Jersey cows because they produce 24 to 30 litres of fatty milk per day, which has a good market price. They also have good infrastructure because they are able to afford it, and consequently, most of it is supplied by the farmers themselves.

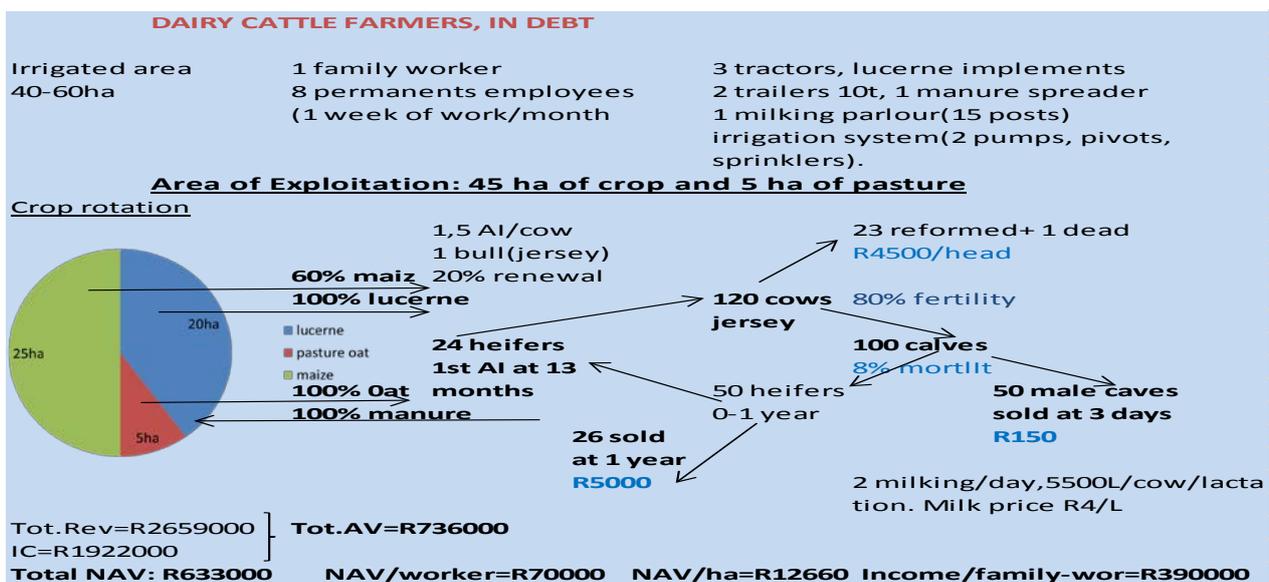


Figure 18: Type 11: Dairy cattle farmers in debt.

The production cost incurred (R1 922 000, on average) is less than the total revenue (R2 656 000, on average), thus yielding positive income (R390 000, on average, per farmer). Consequently, these farmers derive most of their income from farm activities. Many projects are in the process of offering new opportunities to these farmers. For instance, consideration is being given to opening a malt house, a cookie factory and cheese dairy factories in the Modder River area for the purpose of adding value to the milk being currently produced.

The major issue is the small extent of their land which does not allow them to expand their farm activities and so increase their revenue. In addition, the price of milk is low in the private market and these farmers have difficulties in finding reliable markets for their product. The milk has deteriorated sometimes when market could not be found.

4.2.12 Type 12: Extensive livestock farmers who have acquired water rights, farming cereal on large scale, silos (10/150-7%).

This type is composed of ten farmers who farm on privately owned land and are situated in the surrounding areas of the irrigation scheme. These farmers are under contract with GWK for their production services (input cost, training, market of product, etc.), enabling them to farm throughout the year. They have benefited water from the ORWUA since 1987, allowing them to incorporate irrigation in their farm activities.

The farming activities of these farmers are all related to animal husbandry (cattle and small stock) and crop production (maize, wheat and lucerne). They hold an average of 220 ha, of which they use, on average, 61.36 % (135 ha) for maize, 54.5 % (120 ha) for wheat and 11.36 % (25 ha) for lucerne on crop rotation, yielding an estimated 15 tonnes per hectare of maize, 8 tonnes per hectare of wheat, and 3 tonnes per hectare of lucerne. They also have an average of 4 000ha of pasture, of which they use, on average, 75 % (3 000 ha) for animal grazing (500 Dorper ewes, 700 lambs, 50 Bonsmara cows and 40 calves). These farmers generally have important quotas for water and irrigate large areas of land, but do not farm in the pivot corners. In addition, they build silos to store maize and wheat when the price is low and sell when the price increases. They have reduced livestock feed shortage by feeding their sheep and cattle with a part of the maize produced and can feed livestock on the leftover maize during the dry winter months. They also have good infrastructure because they are able to afford it, and consequently most of it is supplied by the farmers themselves.

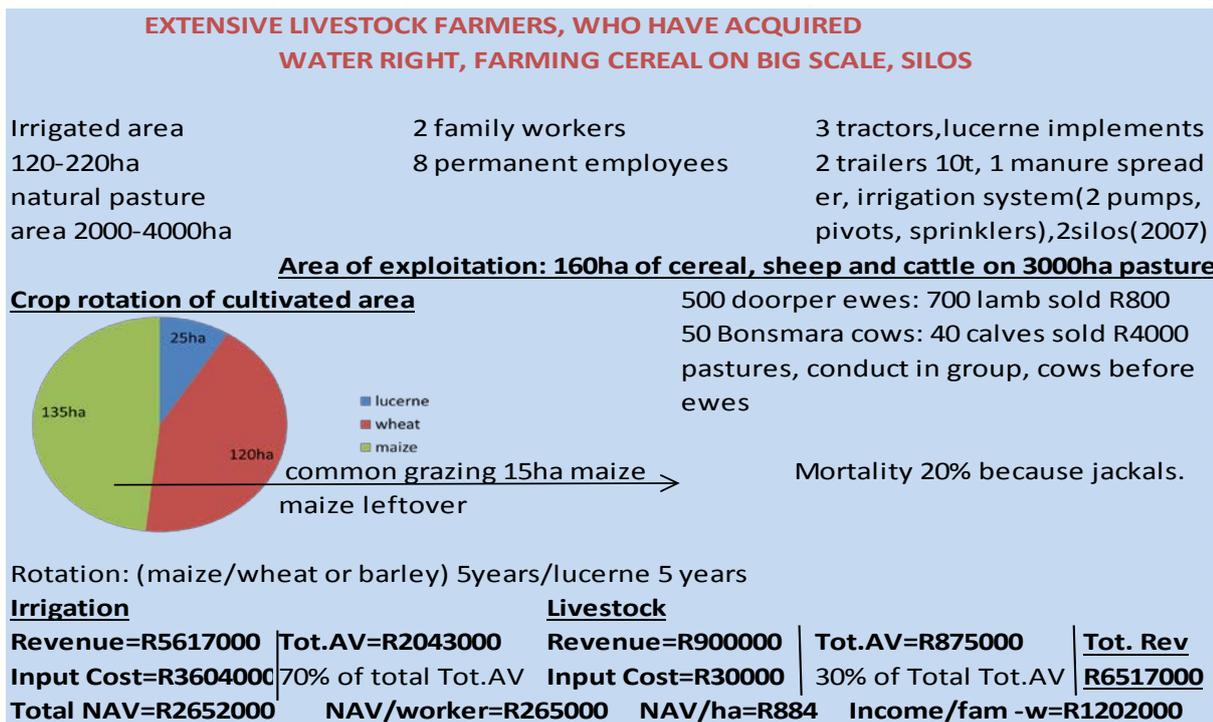


Figure 19: Type 12: Extensive livestock farmers who have acquired water right, farming cereal on large scale, silos.

The production costs incurred (R3 634 000, on average) is less than the total revenue (R6 517 000, on average), thus yielding significant income (R1 202 000, on average, per farmer). It is important to specify that the greater part of farming income, 70 % (R2 043 000, on average) derives from cereal production because of the magnitude of the irrigated area and the good price of maize and wheat in the market, while livestock farming only represents 30 % (R875 000, on average). Consequently, these farmers derive most of their income from farm activities.

The major issue is that the interest rate paid by these farmers to GWK is high (24 % of the total loan). And predators (jackals) kill a fair number of their lambs (20 % mortality). However, since 1998 the use of poison to combat these predators has been prohibited by the government for the protection of wildlife species.

4.2.13 Type 13: Extensive livestock farmers who have acquired water rights, potatoes and onions engaged in “value adding” (6/150-4%).

This type is composed of six farmers who farm on privately owned land and are situated in the surrounding areas of the irrigation scheme. They are under contract with GWK for their production services (input costs, marketing, training, etc.), enabling them to farm throughout the year. They

have acquired water from the ORWUA since 1987, allowing them to integrate irrigation in their farm activities.

The farming activities are all related to animal husbandry (cattle) and crop production (lucerne, maize, wheat, onions and potatoes). They hold an average of 200 ha, of which they use, on average, 40 % (80 ha) for wheat, 20 % (40 ha) for lucerne, 20 % (40 ha) for onions and 20 % (40 ha) for potatoes, yielding an estimated 8 tonnes per hectare of wheat, 3 tonnes per hectare of lucerne, 50 tonnes per hectare of potatoes, and 1 tonne per hectare of onions. They also have an average of 4 000 ha of pasture, of which they use 85 % (3 400 ha) for animal grazing (145 cows, 5 Bonsmara bulls and 100 calves). It is important to specify that potato farming requires intervals of seven years to allow for rotation on the same land to avoid occurrence of different diseases affecting the crop. Thus, these farmers rent additional land from other farmers to plant potatoes every year. They also have good infrastructure because they are able to afford it, and consequently most of it is supplied by the farmers themselves.

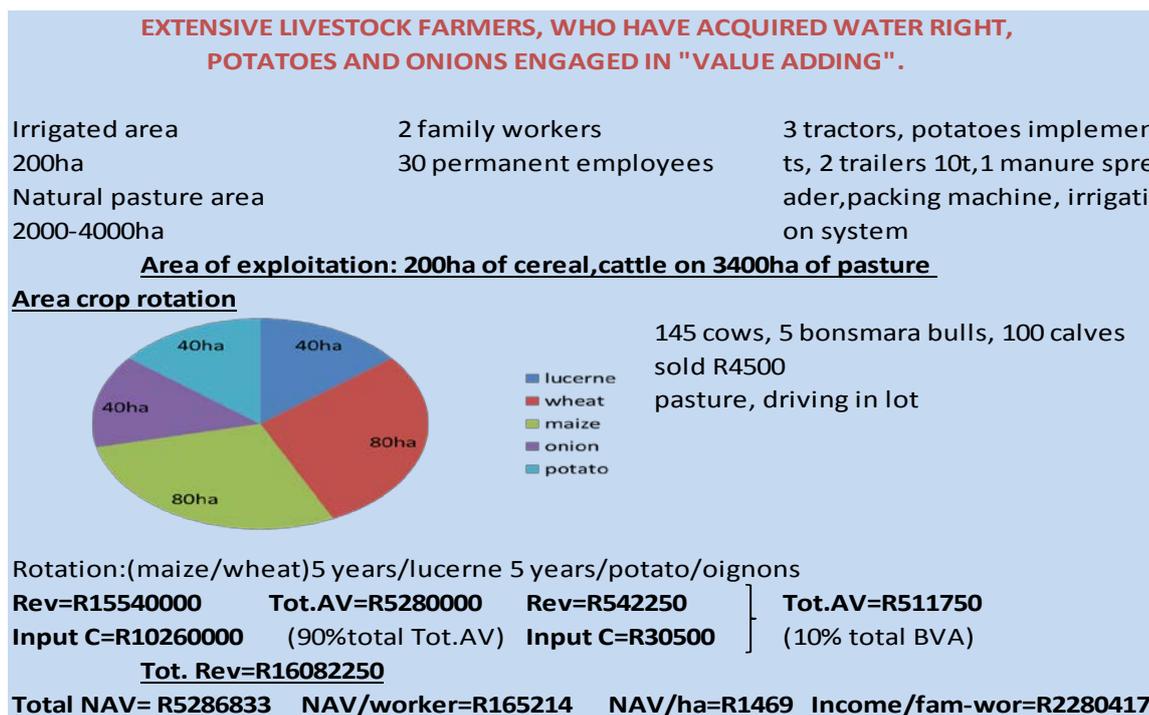


Figure 20: Type 13: Extensive livestock farmers who have acquired water rights, potatoes and onions engaged in “value adding”.

The production costs incurred (R10 290 500, on average) is less than the total revenue (R16 082 250, on average), thus yielding significant income (R2 280 417, on average, per farmer). It is important to record that, a process of “value adding” was put in place with the purpose of adding value to the products. These products (onions and potatoes) follow a value chain process (packed

and wrapped). Thus, these farmers generate the greater part of their income, 90 % (R5 280 000, on average) from crop production, and 10 % (R511 750, on average) from livestock. Consequently, they derive most of their income from farm activities.

The major issue is that the interest rate paid by these farmers to GWK is high (24 % of the total loan). They also face a challenge in acquiring new land for potato farming, as it requires seven year intervals for this crop to be planted on the same land.

4.2.14 Type 14: Part-time extensive livestock farmers (8/150-5%).

This type is composed of eight farmers who farm on privately owned land and are located in the surrounding areas of the irrigation scheme. These farmers are not under contract with GWK for the production costs, but do receive some of the services related to training, organizational structure, motivation, assessment of farmer groups, etc.

The farming activities are all related to animal husbandry (cattle and small stock). They hold an average 4 000 ha, of which they use, on average, 70 % (2 800 ha) for grazing (150 Dorper ewes, 138 Dorper lambs, and 120 Bonsmara cows and 100 calves). It was observed that the Bonsmara cows and Dorper sheep have been selected by these farmers for their economical production in the extensive grazing which is adapted to the semi-arid region.

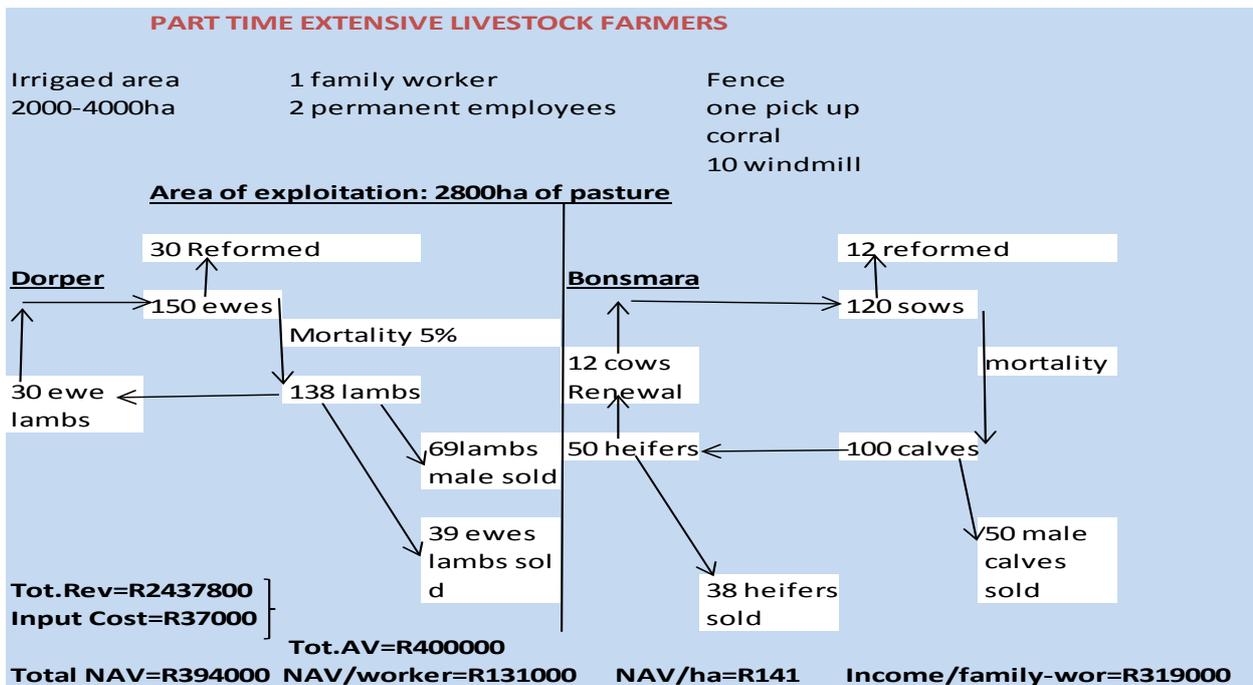


Figure 21: Type 14: Part-time extensive livestock farmers.

The production cost incurred (R37 000, on average) is less than the total revenue (R2 437 800, on average), thus yielding low income (R319 000, on average, per farmer). Consequently, these farmers derive the larger proportion of their income from off-farm activities. For instance, of the eight part-time farmers, four own private companies, three run food shops, and one own a restaurant.

The major issue is the low net revenue of their farm activities. And the predation problem affects these farmers as well, and they can lose as much as 60 % of their lambs per year. It is important to record that predator proliferation in the area has been exacerbated by the development of game farms around the irrigation scheme. Furthermore, in 1998 the government stopped controlling the proliferation of jackals and the use of poison as an anti-predator measure has been prohibited since then. As such, these farmers are expanding their cattle breeding activities to the detriment of sheep breeding, even though the sheep are adapted to the environment. In addition, the lack of quality and fertile land, as well as the lack of financial and technical support from the Department of Agriculture and Rural Development or GWK, hinder the implementation of irrigation farming.

4.2.15 Type 15: Game farmers (10/150-7%).

This type is composed of ten farmers located in the surrounding areas of the irrigation scheme who farm on privately owned land. These farmers are not under contract with GWK for their production services because their game farming is mostly tourist-oriented, rather than intended for food production. It is important to mention that these farmers were previously extensive livestock farmers. Since 1980, the penury of the pasture, accompanied with the phenomenon of predation (jackals), resulted in major losses of their stock. Accordingly, they have converted their operations into game farming.

The farming activities of these are all related to animal husbandry (buffalo, golden Oryx, brown springboks, white and black impala, etc.). They hold an average of 10 000 ha of natural pasture, of which they use, on average, 60 % (6 000 ha) for grazing. Their stock ranges from herbivores to exotic species highly desirable for trophies. It is important to note that these farmers are diversified within this category. Some have specialized in the breeding of renewal animals and sell their game stock for further reproduction; others are more tourism-oriented (building hotels and leisure infrastructures for tourists); and finally, others specialize in hunting activities (for trophies). In addition, they have less-developed implements because of the absence of irrigation for their farming activities.

GAME FARMERS

Farm land size	1 family worker	Long fence and electricity
3000-10000ha	4 permanent employees	1 pick up windmill

AREA OF EXPLOITATION: 6000 ha of natural pasture

About 10 herbivorous animal species
Many species«exotic» highly wanted for trophies

Tot.Rev=R2717000 Tot.AV=R2243000

Input Cost=R475000

Total NAV=R2126000 NAV/worker=R425000 NAV/ha=R350 Income/family=R2029000

Figure 22: Type 15: Game farmers

The production cost incurred (R475 000, on average) is less than the total revenue (R2 717 000, on average), thus yielding significant income (R2 029 000, on average, per farmer). It was observed that the common antelopes are less profitable than cattle or sheep, but the exotic species (buffalo, golden Oryx, brown springboks or white, black impala, etc.) are sold for reproduction or hunted for trophies at high prices. Consequently, these farmers generate most of their income from farm activities.

The major issue is that many diseases are spread among the herd because of the unnatural concentration of animals, causing death of stock. Furthermore, predators regularly attack small game species, causing significant loss.

4.3 ECONOMIC ANALYSIS

This study of the typology of farming systems in the Riet River Irrigation Scheme and its dry land has discerned fifteen types of irrigation farmers, irrigation-livestock farmers, livestock farmers, dairy farmers and game farmers. This section reveals different variations in terms of income per farmer, total farming revenues, net added value per farmer, and net added values per hectare, for all the identified types. The land reform beneficiaries were analysed separately from the other commercial and smallholder farmers because of their insecure tenure rights to the land. Their farming activities are partly subsidized by the government and the calculation of their income and net added value

takes into consideration all the estimated land rental prices, subsidies, and off-farm income included in their production costs, as compared to other types of farmers.

4.3.1 Income per farmer for land reform beneficiaries

These farmers rely mostly on off-farm income for their living. The size of land held by these farmers is not economically viable, taking into account the number of beneficiaries on the same land (many beneficiaries on small areas). With regard to Type 1, it was impossible to represent graphically the net added values or farming income of this particular type owing to the negative income these farmers produce (see Figure 8).

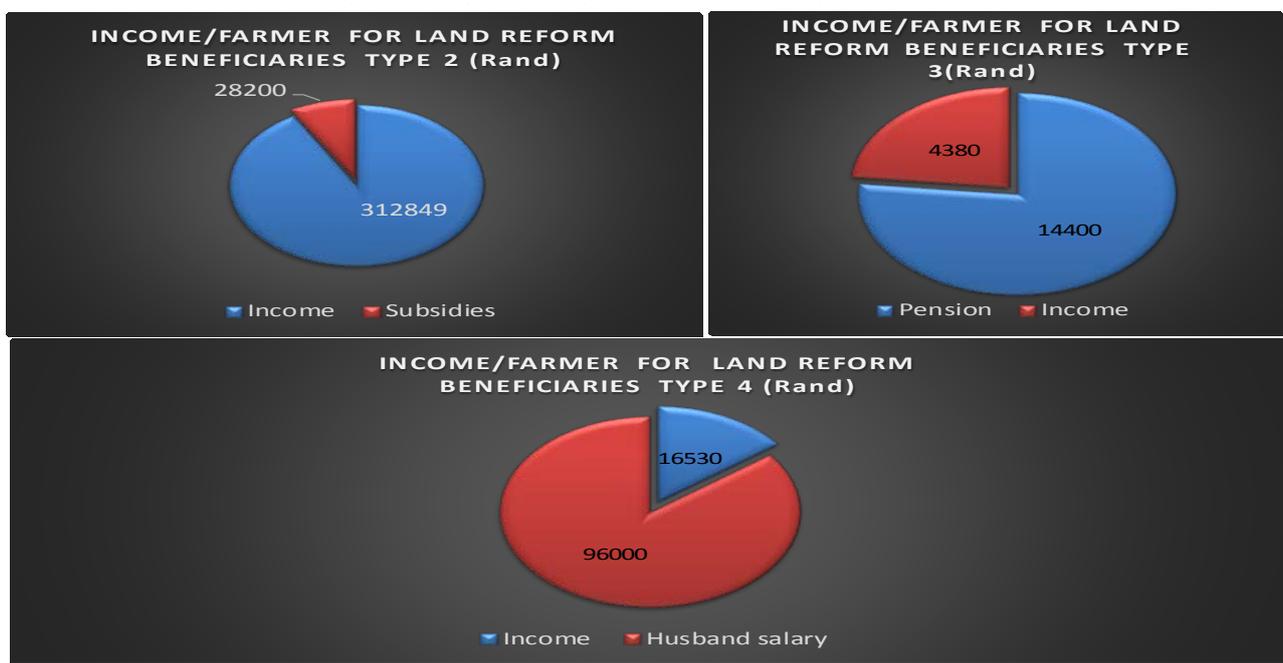


Figure 23: Income per farmer for land reform beneficiaries.

However, larger farming income is observed in Type 2 because of the presence of irrigation in their production systems and the subsidies acquired from the government that can be reinvested in farming.

4.3.2 Income per farmer for irrigation, livestock, dairy and game farmers.

Significant income is observed in the most diversified production system (Type 13) and the transformation factory is a value added component. This is followed by game farming (Type 15), which is lower in labour but higher in revenue.

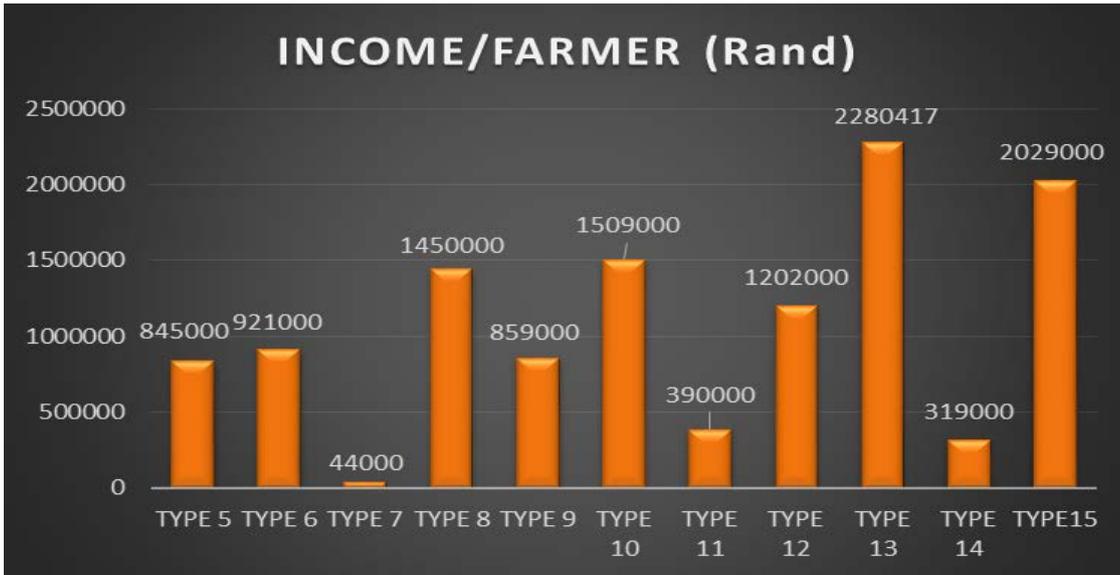


Figure 24: Income per farmer for irrigation, livestock and game farmers.

With regard to Type 10, the presence of pecan nut farming enables these farmers to increase their income. Thus, farmers practising irrigation earn more income than livestock or dairy farmers do (Type 11).

4.3.3 Net added value per farmer for land reform beneficiaries

It is quite clear that the good net added value gained by Type 2 is attributable to the presence of irrigation in their production systems and a lesser number of beneficiaries on the same land (one family on the land) with less labour.

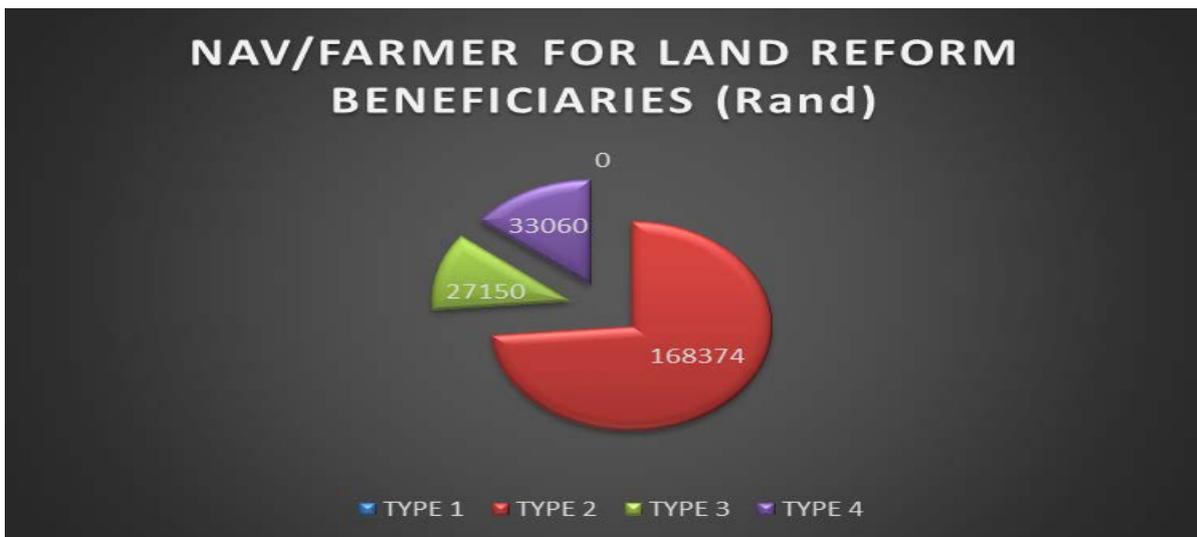


Figure 25: Net added value per farmer for land reform beneficiaries.

4.3.4 Net added value per farmer for irrigation, livestock, dairy and game farmers.

The cereal and game production systems are lower in labour, and the NAV/worker quotient is therefore high for production systems 10 and 15. The production systems that include livestock or lucerne are labour intensive.

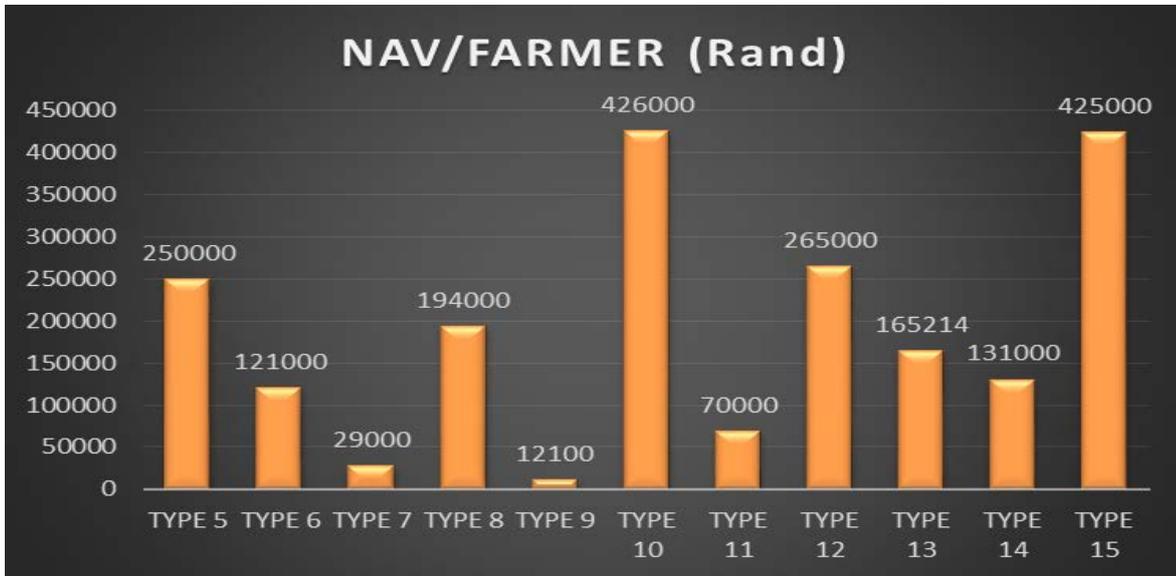


Figure 26: Net added value per farmer for irrigation, livestock, dairy and game farmers.

4.3.5 Net added value per hectare for land reform beneficiaries.

The high added value per hectare depicted by Type 2 is attributable to the presence of lucerne in their production systems which provides a yearly income (8 months/annum of harvest). As such, a portion of the income from lucerne can be reinvested in maize and wheat production which provides good productivity (7t/ha for wheat, 14t/ha for maize on average), with a lower input cost than Type 1 and Type 3.

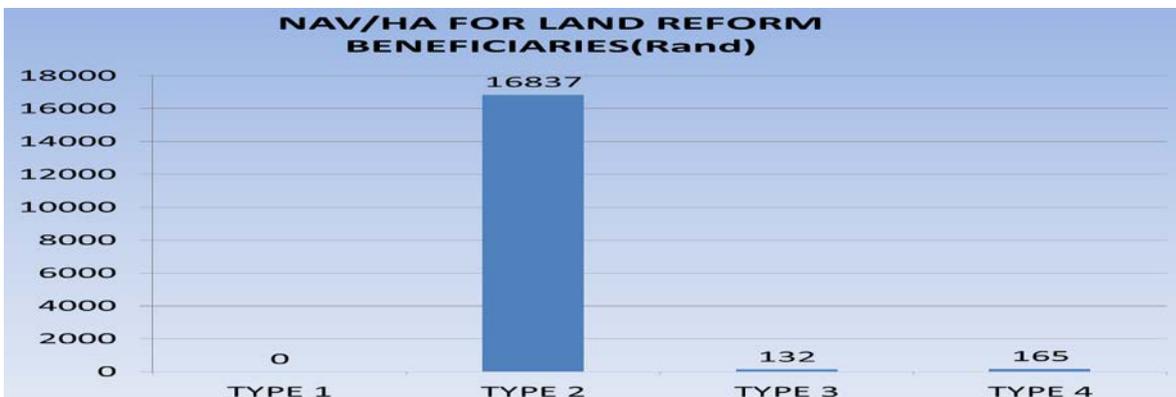


Figure 27: Net added value per hectare land reform beneficiaries.

4.3.6 Net added value per hectare for irrigation, livestock, dairy and game farmers

The irrigation and dairy farmers show a considerable net added value per hectare because of good revenue generated per hectare in an intensive farming system. On the other hand, extensive livestock and game farmers farm on large areas of land, which minimizes profitability per hectare.

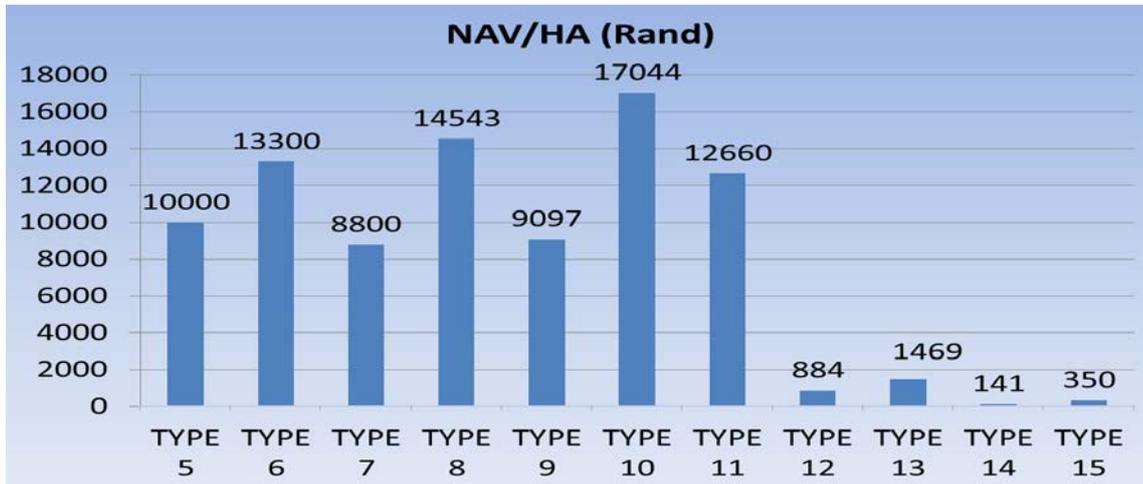


Figure 28: Net added value per hectare for irrigation, livestock, dairy and game farmers.

4.4 GWK'S CONTRIBUTION TO FARMERS BY TYPOLOGY

In an interview conducted with Mr. E.Groeners, Emerging farmers division manager of GWK, on 2012-05-23, he mentioned that GWK focuses on four fundamental clusters (people or farmers, soil, finance, and product) composed of a bundle of farmers' services.

Table 7: GWK services per cluster

FARMERS	SOIL	FINANCE	PRODUCT
<p>Training team work, organizational structure, motivation, assessment of farmer groups, monitor progress, facilitate and coordinate relevant farm skills development and training, provides technical support and advice; coordinate mentorship, technical advice, joint business planning and support, coordinate implementation of agreed upon plans and build commercial farmers up to operate as mentors.</p>	<p>soil preparation and planting advice, production practices, soil properties, irrigation assistance, weed and pest control, determination of land potential and business bases of intended farming operations to increase farmers' production.</p>	<p>production loans, financial system, record keeping, cash flows, income statements, enterprise budget, has a Safex trading room updating farmers with current and future market prices.</p>	<p>Crop insurance advice and support, harvesting, market for products, Auctions and Meat Industries, services for livestock procurement and facilitates transactions between producers, sheep and cattle abattoir, handling and trading of grain, grain procurement, grain marketing and merchandizing, grain grading and storage (56 cent/t/day) and implements auctions.</p>

Source: GWK, 2012.

Table 8: GWK'S contribution to typology.

FARMERS TYPES	CLUSTERS OF GWK SERVICES							
	FARMERS		SOIL		FINANCE		PRODUCT	
	No	%	No	%	No	%	No	%
Type 1	7/9	77.7	0/9	0	0/9	0	0/9	0
Type 2	8/8	100	0/8	0	0/8	0	0/8	0
Type 3	0/5	0	0/5	0	0/5	0	0/5	0
Type 4	7/9	77.8	0/9	0	0/9	0	0/9	0
Type 5	19/19	100	19/19	100	19/19	100	19/19	100
Type 6	0/15	0	0/15	0	0/15	0	0/15	0
Type 7	3/8	37.5	0/8	0	0/8	0	0/8	0
Type 8	10/10	100	10/10	100	10/10	100	10/10	100
Type 9	10/10	100	10/10	100	10/10	100	10/10	100
Type 10	16/16	100	16/16	100	16/16	100	16/16	100
Type 11	7/7	100	0/7	0	0/7	0	0/7	0
Type 12	10/10	100	10/10	100	10/10	100	10/10	100
Type 13	6/6	100	6/6	100	6/6	100	6/6	100
Type 14	8/8	100	0/8	0	0/8	0	8/8	100
Type 15	0/10	0	0/10	0	0/10	0	0/10	0
Total	111/150	74	71/150	47	71/150	47	79/150	52
	50		0				0	

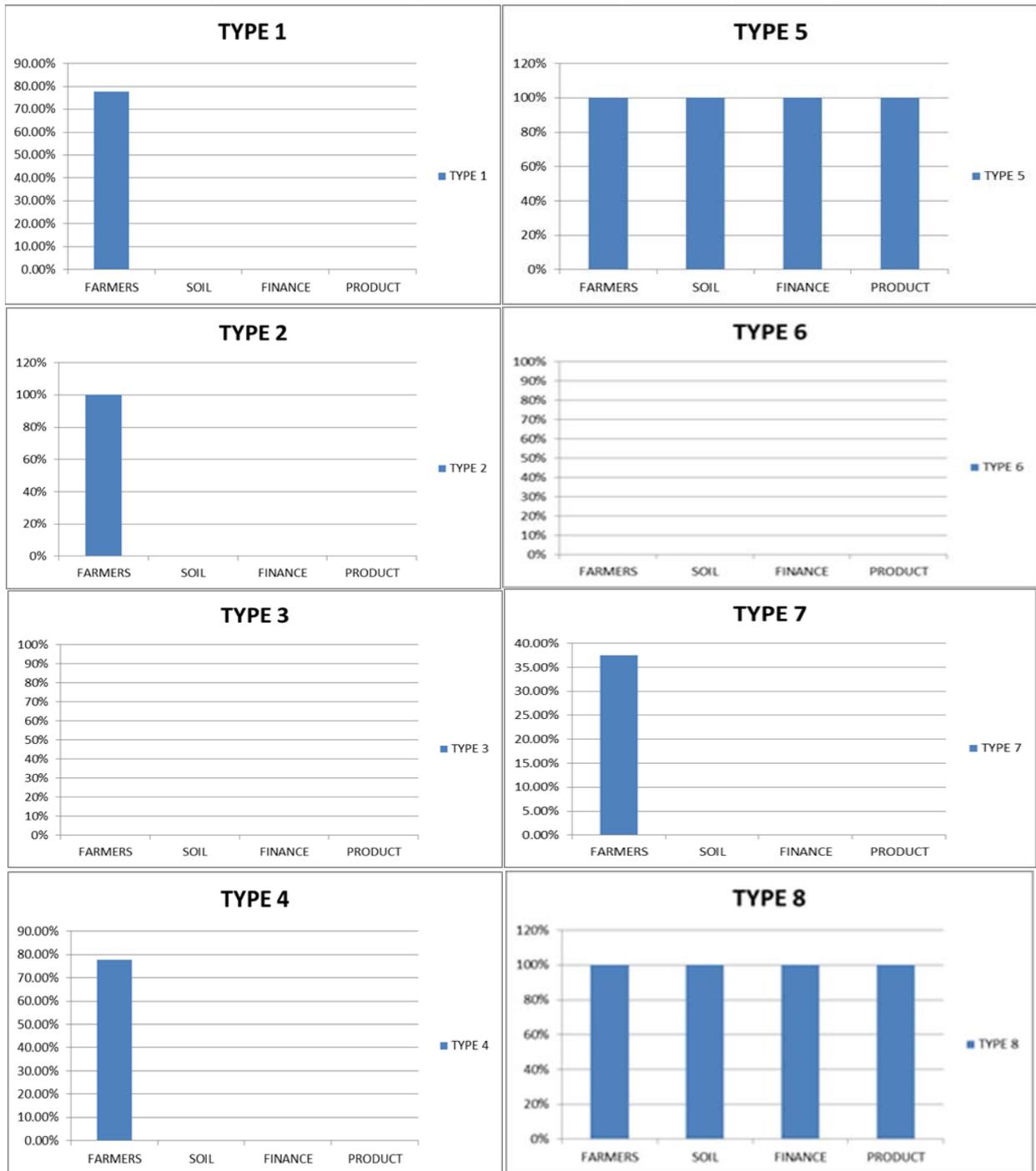


Figure 29: GWK contribution per type per cluster (%)

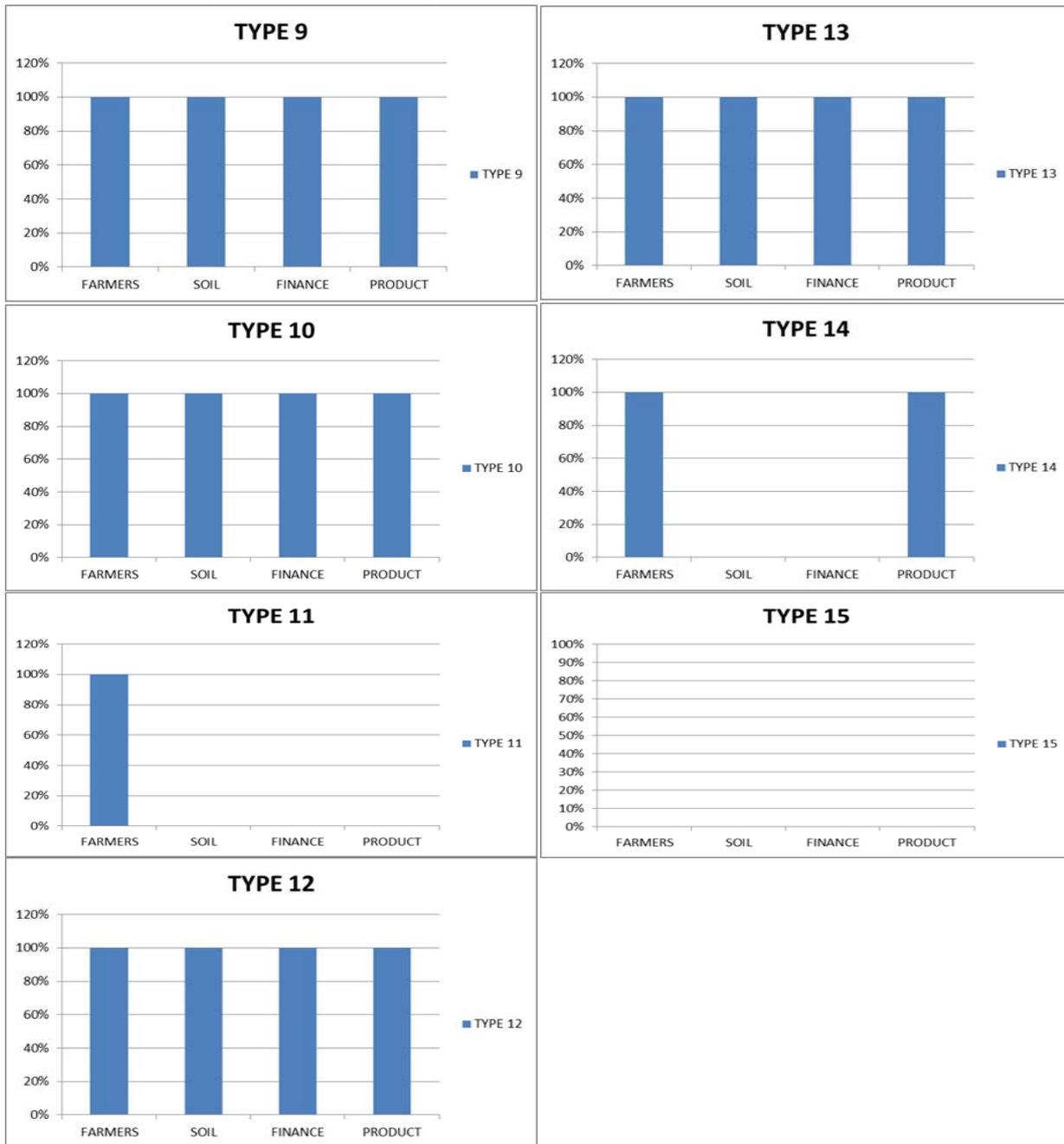


Figure 30: GWK contribution per type per cluster (%).

It has been observed that farmers in the irrigation scheme and its dry land are divided into four different groups with regard to their accessibility to GWK services:

The first group, which includes Types 1, 2, 4, 7 and 11, receive only services from the “FARMER” cluster. These farmers are mostly poor in resources and are composed of smallholder, Land Reform Beneficiaries, and dairy farmers. Farmers in Types 1, 2 and 4 lack property rights and their farming area is too small. With regard to Type 7, these farmers have tenure land rights, but the size of their land is also small. This situation hinders their access to GWK services in the “SOIL”,

“FINANCE” and “PRODUCT” clusters. As a company, GWK services are provided to farmers for the purpose of making profit. Thus, it is not typically interested in small-scale farmers, though the existence of emerging farmers division in its management. With regard to Type 11, it has been proven that GWK does not operate in the milk business, as milk is a perishable product. These farmers have a daily income for running their businesses. Thus, they only receive services from the “FARMERS” cluster.

Farmers in the second group, which is comprised of Types 5, 8, 9, 10, 12 and 13, do have irrigation in their farming systems. These farmers are rich in resources and mostly include large-scale commercial farmers holding fertile arable land and land tenure rights. Thus, these farmers receive all the GWK services. This situation is explained by the fact that GWK is concerned with making profit.

The third group, comprising Types 3, 6 and 15, do not receive services from the GWK. This situation is caused by the lack of tenure rights in Type 3 (livestock smallholder farmers on municipal land), as these farmers are all land reform beneficiaries. With regard to Type 6, although these farmers are rich in resources and hold land tenure rights, the significant farming income per farmer earned can be reinvested and negates their need to contract for GWK services, because they produce lucerne on large areas of land, accompanied by certain extra farming activities (buying lucerne from other farmers and reselling it, and renting out implements). With regard to Type 15, these farmers are all game farmers, holding tenure rights to their land, rich in resources, and their daily farming income enables them to run their businesses. Their revenues are mostly from various non-farm activities, such as trophy hunting, tourism, etc. Thus, their good income generated does not place them in a position to require assistance from the GWK.

And lastly, there is Type 14, which is composed of part-time extensive livestock farmers. These farmers are poor but only receive services present in the “FARMERS” and “PRODUCT” clusters, as their off-farm income can be reinvested in farming.

Therefore, the majority of farmers (55 %) are under contract with GWK for their farming production. A consistent number of these farmers contract various services with regard to training, input costs, product market, etc. This is made possible by the land tenure rights which these farmers have acquired, as compared to land reform beneficiaries and smallholder farmers with insecure property rights, who only receive services in the “Farmers” cluster. Accordingly, no collateral can be offered as a guarantee to access finance and soil and product services from GWK. The company has been hesitant to provide credit to smallholders and land reform beneficiaries owing to the high risks

connected with lending to them. These risks are attributable to insufficient or absent collateral (owing to poorly defined tenure rights and low capital levels), poor financial record-keeping, and high transaction costs involved in granting small production loans. The South African Government has launched various initiatives in the area to promote access to credit for low-income producers (smallholder and land reform beneficiaries), but this has generally had limited success, as most of these farmers either receive insufficient credit or none at all. Therefore, the GWK should provide other services, including production inputs, to these farmers who find themselves limited by credit access.

4.5 CONCLUSION

This chapter has concentrated on the analysis of the main findings and results of the study. A synthesis was also drawn from the data analysis. The development of a typology of a sample of farmers farming at the Riet River Irrigation Scheme and its surrounding area was systematically articulated, including the testing of the hypothesis that the comportment of farmers is diverse and is revealed in the way in which farmers view farming and engage in agricultural practices. The typology offered 15 distinct types of irrigation farmers, irrigation-livestock farmers, livestock farmers, dairy farmers and game farmers, and described the major clusters of services provided by GWK for these specific types (Farmer, Soil, Finance and Product). The concerns raised in the problem statement were also tackled. The next chapter comprehends an overview of the study, as well as a discussion of the major findings, ends with the conclusions and recommendations of the study.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This chapter seeks to strengthen and summarize the results of this study, to discuss different main findings, and present the recommendations. The objectives of the study are firstly, to understand the diversity of South African agriculture. Secondly, the study gives a reflection regarding agrarian change in South Africa and policy implications. Thirdly, the study assesses the services provided by GWK (Griqualand West Cooperative) within the framework of the diversity identified.

5.1 OVERVIEW

The study focused on farmers within the Riet River Irrigation Scheme and its dry land. In order to achieve the above objectives, a landscape study, detailed interviews with farmers and the typology of the farmers characterizing the farming systems were completed. This included a historical overview of land reform in the Free State and Northern Cape, which is detailed in the literature review, and an analysis of the farming types and land use practices of the identified farmers, including the beneficiaries of land reform programmes. The study concentrated on the agrarian diagnosis in the Riet River Irrigation Scheme and its dry land, and was aimed at addressing the following features:

- Fifteen types were identified from the 150 surveyed farmers. Understanding this diversity should assist in projects and programmes related to poverty and agricultural empowerment of smallholder farmers and land reform beneficiaries (Types 1, 2, 3, 4, 7 and 14).
- The actual situation in the area demonstrates that Types 5, 6, 8, 9, 10, 11, 12, 13 and 15 farming systems are highly profitable. The major production credits and other services for Types 5, 8, 9, 10, 12 and 13 come from the GWK. These farmers rely solely on farming for their living. Types 1, 2, 3, 4, 7 and 14 only receive a small income from farming; their farming systems are not economically viable and these farmers rely on off-farm income for their living. The results from the farmers interviewed reflect that, 8.7 % have access to pension grants, 5 % have access to salaries and wages, 6 % have access to remittances from working husbands, 5 % have access to government subsidies, and 75.3 % rely on farming.

- The study also appraises the contribution of GWK to each of the 15 types identified. It can be concluded that the GWK, in order to limit the business' risk of loss and to guarantee its business profit, deals more with big businesses, rather than with small businesses considered to be more demanding in investment, but with little or no profit. Thus, there is absence of agricultural empowerment for farmers of Types 1, 2, 3, 4, 7 and 14.
- With regard to the analysis and discussion above, the study has shown that the farming systems studied in the Riet River Irrigation Scheme and its dry land are diverse, dynamic and complex.
- Understanding the farming systems in the Riet River Irrigation Scheme and its dry land requires an understanding of the complex, interrelated matrix that characterizes farmers' livelihood strategies, as well as of the socio-economic and institutional factors influencing their household income. Owing to the different constraints to improve their yield which are faced by farmers in Types 1, 2, 3, 4, 7 and 14 in the irrigation scheme and its dry land, policies need to consider diversity in order to address the different types of issues facing farmers in the scheme, province and throughout the country.
- The results obtained from the study show that there is a presence of diversity in farming systems and production, and also demonstrate that the farming income from certain farming systems (Types 1, 2, 3, 4, 7 and 14) is insufficient for attaining a better standard living. The lack of quality land, property rights in the land, water, training, quality mentorship, and financial support, and the lack of the sustainable agrarian reform were the main problems. It was also shown that GWK was not interested in small-scale farmers (with no collateral), although it declaims the empowerment of these farmers (Types 1, 2, 3, 4, 7 and 14) through the emerging farmers division that exists within its system management hierarchy. Farmers of Type 5, 6, 8, 9, 10, 11, 12, 13 and 15, are doing well, although certain issues do exist, as stated in the discussion. These farmers have indicated that their exclusion from acquiring new water rights, theft, high interest rates payable to GWK, lack of new fertile land, problems of jackal predation, etc., all obstruct their development.

5.2 MAIN RESULTS

The study focused on ascertaining the existence of farming system diversity within the Riet River Irrigation Scheme and its dry land. The study showed that there is a diversity of farmers within the study area and has revealed that, presently, the farming systems of Type 5, 6, 8, 9, 10, 11, 12, 13 and 15 are economically viable, compared to farmers of Type 1, 2, 3, 4, 7 and 14, who rely the

most on off-farm income for their living. The final objective was to evaluate the contribution of GWK to the agricultural empowerment of farmers in the scheme.

5.2.1 Presence of farming systems diversity and results of typology

The Riet River Irrigation Scheme and its dry land disclose several types of farmers within the area. The study has identified 15 types of farmers in the Riet River Irrigation Scheme and its dry land. These are: Type 1- Land Reform beneficiaries with irrigation (SLAG PROGRAMME) (6 %); Type 2- Family beneficiary of land reform with irrigation (PLAS programme) (5 %); Type 3- Livestock smallholder farmers on municipal land (3 %); Type 4- Women breeder farmers on municipal land (6 %); Type 5- Cereal farmers, maize, wheat under pivot (12.7 %); Type 6- Lucerne producers with an extra agricultural activity linked to the production (buy-sell, implements rental) (10 %); Type 7- Small-scale lucerne producers, pensioners or part-time (5 %); Type 8- Farmers adapting to the market with risk minimisation across cereals production, lucerne, peanuts and cattle fattening (7 %); Type 9- Merino sheep breeders (meat-wool), recently installed (7 %); Type 10- Annual cereal farmers, maize-wheat, producing pecan nuts in pivot corners (10.7 %); Type 11- Dairy cattle farmers, in debt (5 %); Type 12- Extensive livestock farmers who have acquired water rights, farming cereal on large scale, silos (7 %); Type 13- Extensive livestock farmers who have acquired water rights, potatoes and onions engaged in “value-adding” (4 %); Type 14- Part-time extensive livestock farmers (5 %); and Type 15- Game farmers (7 %). Each of these types has its private livelihood strategies; some of these types (5, 6, 8, 9, 10, 11, 12, 13 and 15) rely highly on agriculture as a source of income, whereas farmers in types 1, 2, 3, 4, 7 and 14 mostly earn income through the means of pension grants, remittances, government subsidies, and involvement in salaried or waged activities held elsewhere.

5.2.2 Farming production in the irrigation scheme and its dry land

The study shows that the actual farming production level in the area is high for farmers of Type 5, 6, 8, 9, 10, 11, 12, 13 and 15, and low for farmers of Type 1, 2, 3, 4, 7 and 14. Most of the farmers of type 5, 6, 8, 9, 10, 11, 12, 13 and 15 have secure tenure rights that can be used as collateral to access production and market services from the GWK for their products. The low farming production of Types 1, 2, 3, 4, 7 and 14 is attributable to the fact that most of these farmers have no land tenure or are too small in scale, which hinders their possibility of getting production and marketing services from the GWK.

It is important to mention that after the interviews with farmers, it was revealed that the government agrarian reform approaches to empower farmers (mostly of Type 1, 2, 3, 4, 7 and 14) are very poor. This has negative consequences, such as low production and income. Thus, the major part of the household income is from off-farm activities. For instance, in the case of Type 5, 6, 8, 9, 10, 11, 12, 13 and 15 farmers, the average net income per farmer ranges from R39 000 to R2 280 417 per annum, compared to Types 1, 2, 3, 4, 7 and 14, who range from negative income or (R4 380) to R319 000 per farmer per annum. This situation is the consequence of different factors, such as lack of property rights, poor access to training, lack of production inputs, failure to plant at the right time, poor extension services, difficulty in accessing farming water, fencing being in bad condition, presence of predators on livestock, difficulties to feed and shelter the livestock in winter, the advanced age of the majority of farmers, difficulties in planting the land overall, lack of quality mentors, and inadequate services provided by the Griqualand West Cooperative. Property rights remain a stumbling block for these farmers. The farming area is too small to generate significant production for deriving a decent income, and farmers diversify their livelihood strategies with off-farm activities to cope with uncertainties. It is important to mention that production costs remain high for farmers of Types 1, 2, 3, 4, 7 and 14, and that the yields do not or poorly facilitate a return on investment. The majority of these farmers' farming systems are not economically viable and their farming activities are mostly supported by off-farm income. While these farmers have made known their wish of being involved with GWK to increase their production, the lack of secure tenure rights in the land appears to be a major constraint. Thus, they are eager to form an alternative cooperative or farmers association to assist with the speeding up of the service delivery process and overcome constraints related to low farming production.

With regard to GWK services received by farmers, it has been shown that 55 % of farmers in the scheme are under contract with GWK for their production and market services. They have secure tenure rights in their land and enjoy good farming production and income. These farmers include Types 5, 8, 9, 10, 12 and 13, who receive all the GWK clusters of services (Farmers, Soil, Finance and Product). With regard to farmers of Type 1, 2, 4, 7, and 11 who only received services in GWK's Farmer cluster, or Type 14 receiving services in the Farmers and Product (services) clusters, these services were assessed to be of poor quality and to not contribute to their agricultural empowerment. They lack services in the Soil, Finance and Product clusters, which might otherwise help them improve their production and income. This situation was explained though either the lack of tenure rights in of their land, or the small size of their farming business which limited them from obtaining all services from GWK. Farmers in Types 3, 6 and 15 do not receive any service from GWK. This was explained by the fact that Type 3 farmers, as land reform beneficiaries, lack the secure tenure rights required to qualify them to get involved with GWK. With

regard to Type 6, these farmers had retreated from contracting with GWK owing to the fact that the lucerne produced by them and the extra agricultural activities undertaken generate sufficient income which can be easily reinvested in farming. With regard to Type 15, it was shown that game farmers also produce consistent revenue which can be simply reinvested in farming and this nullifies any desire on their part to contract services with GWK.

5.2.3 Strategies, policy and recommendations

In the Riet River Irrigation Scheme and the surrounding dry land, farmers are facing important constraints caused by lack of support from government, and GWK only provides farming services to large-scale commercial farmers who hold secure tenure of their land. A great need remains among smallholder farmers and land reform beneficiaries (SLAG, PLAS and commonages) to access quality and sustainable government services to improve and diversify their farming systems, activities and income.

It is important to note that the data collected on the diversity of farmers' farming systems in the Riet River Irrigation Scheme and its dry land should be taken into consideration in order to implement new regulations and policies that could assist farmers to increase their farming production and diversify their livelihoods. This study identified 15 diverse types of farmers within the Riet River Irrigation Scheme and its dry land. Giving additional assistance to farmers, mostly in Types 1, 2, 3, 4, 7 and 14, by strengthening their tenure rights in land, might attract GWK towards assisting them with different clusters of farming services offered (Farmers, Soil, Finance and Product) to develop their farming activities and increase their income. However, only six types currently receive full support (Types 5, 8, 9, 10, 12, and 13).

The diversity identified in this study can assist the government and development organizations in planning facilities to make service delivery and support to farmers better adapted to the different types and thus to their different needs. This will help in making service delivery, support and extension services better adapted, and probably more successful, and in implementing projects related to poverty and resource management. There is a necessity to facilitate access to production loans, either from the government or from the GWK, to enable farmers in Types 1, 2, 3, 4, 7 and 14 to diversify their farming systems and produce commercially.

Quality mentorship and extension services must be encouraged, taking the identified diversity into account. Extension services have been assessed to be very poor in addressing farmers' needs; the number of extension officers in the area has been revealed to be insufficient and, furthermore, it is believed that they lack in professionalism. Skills development has encountered a major setback with respect to empowering farmers in Types 1, 2, 3, 4, 7 and 14, owing to the poor quality of public extension services, where the existing farmer training programmes miss the mark, by trying and failing to give training in the field. While the mentorship programmes have good intentions and have the capacity to develop agricultural skills in the scheme, the mentorship is mostly limited to teaching production skills, whereas these farmers mostly need management skills, as well. Smallholder farmers and land reform beneficiary farmers (Types 1, 2, 3, 4, 7 and 14) in the scheme also have to rely on a weak public extension sector, whereas large-scale commercial farmers (Types 5, 6, 8, 9, 10, 11, 12, 13 and 15) have secure access to quality private extension services, or to those provided by GWK. A balanced mix of extension and mentorship must be found to capacitate farmers in Types 1, 2, 3, 4, 7 and 14 for operating viable agriculture businesses.

Farmers in Types 1, 2, 3, 4, 7 and 14 also need to organize and need support to do so, as currently these types are highly disorganized and misrepresented. They might learn a lesson or two from farmers in Types 5, 6, 8, 9, 10, 11, 12, 13 and 15, since the success of these farmers can be partly explained by how highly organized and well represented they are. There is a general misconception that GWK provides the best way for organizing smallholder farmers and land reform beneficiaries (Types 1, 2, 3, 4, 7 and 14). Other farmers' organizations, such as farmer unions and commodity associations, have not been useful either; the case of ASFA in the Free State and Northern Cape show that significant investment is needed to establish strong farmer associations which can fight for the cause of these farmers.

The following are recommendations that should be implemented in order to make farmers in the Riet River Irrigation Scheme and its dry land more productive and commercially viable:

- **Approaches to agricultural empowerment of type 1, 2, 3, 4, 7 and 14**

The study found that, for the farmers in Types 1, 2, 3, 4, 7 and 14 in the area to be successful, there must be participation by farmers, researchers, extension personnel and the government in terms of technology transfer, farming systems development, training and regular visits, as well as farmer field school approaches. Their integration with the Orange-Riet Water User Association with

regard to the transferring of water reserved for black farmers and the socio-economic situation of these farmers will enhance effective production.

- **Agricultural researchers to concentrate on farmers of type 1, 2, 3, 4, 7 and 14 and farmer training should be strengthened in the area**

Additional, intense research to comprehend the farming systems of these farmers in the Riet River Irrigation Schemes and its dry lands needs to be conducted to better improve the understanding of the complexity, dynamic and diversity of these farmers, thus facilitating the implementation of good policies by government and development agents.

These types of farmers can be more productive if quality training is provided. These farmers should be motivated and empowered in their purpose of increasing their yield and revenues through the farmer field school approach, or farming training in the technical approach. Because there are only a few extension officers to assist a considerable number of farmers, the government should increase the number of field extension officers, who should have the necessary quality of training to enable them to respond to farmers' needs in an optional time. The GWK should, in partnership with the government, provide quality training to these farmers, or allocate quality mentors to assist in the training of the farmers, and carry out farming activities with the participation of farmers.

While most of farmers in Types 5, 6, 8, 9, 10, 11, 12, 13 and 15 provided adequate and exact information from their record-keeping during the interviews, data from farmers in Types 1, 2, 3, 4, 7 and 14 were mostly based on estimations owing to the non-existence of record-keeping activities. Additional data on production and marketing were gathered from the GWK. Farmers' management skills should be imparted to these farmers to facilitate any further research endeavours.

- **Government should provide new water rights to farmers of type 5, 6, 8, 9, 10, 11, 12 and 13.**

The National Water Act of 1998 restricted white farmers from obtaining access to new water rights in South Africa. In the Riet River Irrigation Scheme and its dry land, farmers in Types 5, 6, 8, 9, 10, 11, 12 and 13, who are mostly white, have been facing problems of insufficient water rights to increase and extend their farming systems and agricultural production. Government should reform the Act so that water can once again be allocated to these farmers, as they constitute a consistent

part of the sector in terms of production. More water rights will enable them to increase their farming activities, production and employment.

- **Government should consistently subsidise and support farmers of type 1, 2, 3, 4, 7 and 14**

These farmers suffer from the lack or insufficient production input to improve or diversify their farming systems and increases their farming income. Government should assist these farmers in the drafting of their farms' recapitalization plans and adequately subsidize the plans.

- **GWK should provide production credits to farmers of type 1, 2, 3, 4, 7 and 14**

It has been observed that GWK only provides production loans to farmers with collateral security. Farmers in Types 1, 2, 3, 4, 7 and 14 should receive the same right of access to production credits, through the supervision of an experienced mentor. And GWK should adapt their credit facilities to serve farmers of Types 1, 2, 3, 4, 7 and 14, characterized by low farming production and income.

- **Land tenure of farmers of type 1, 2, 3 and 4 to be secured**

These farmers operate on municipality or government lands, with no property rights. Government should transfer the land concerned and improve tenure governance, and ensure that actions regarding tenure and its governance are consistent with their existing obligations under national law, so as to enable these farmers to have access to production credits from agricultural agribusinesses or cooperatives, such as GWK.

- **Agricultural cooperatives or farmers associations should be encouraged**

Because many farmers' cooperatives have been converted into agribusinesses, new agricultural cooperatives or farmers associations should be formed, existing ones overhauled, to enable all types of farmers in the area to resolve the problems that impinge on their production or market. It is noted that farmers under contract with GWK complained of the high interest rate levied. For

instance, AFASA (in the Free State and Northern Cape provinces) is a black farmers association that should be supported.

- **The land bank should provide financial support to farmers of type 1, 2, 3, 4, 7 and 14**

The land bank should finance directly individual farmers who need medium term loans to improve their productions. The Bank should align its delivery network to facilitate and/or finance land transfers, provide production financing, establish agricultural entrepreneurs, and facilitate agricultural support and market access.

- **Marketing of products**

While farmers in Types 5, 8, 9, 10, 12, 13 market their products through GWK, the government should assist farmers in Types 1, 2, 3, 4, 6, 7, 11, 14 and 15 to augment their market-oriented production. Farmers in Types 1, 2, 3, 4, 7 and 14 are mostly involved in livestock farming (cattle, sheep and goats), with some lucerne, maize and wheat production, which generates neither a reliable income nor a quasi-total loss of income. These farmers can also be strengthened to build contact or partnership with GWK for a flow of their products. The farming ought to be undertaken with all seriousness and these farmers must graduate to full-commercial farmers, relying absolutely on farming revenues for their living.

5.3 FURTHER RESEARCH

South Africa should engage in more detailed data gathering for different types of farmers, in particular, smallholders. The latter will allow specific capacity building for different types of farmers.

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