EVALUATION OF THE REVITALIZATION OF SMALLHOLDER IRRIGATION SCHEMES: A CASE STUDY OF KROKODILHEUWEL IRRIGATION PROJECT IN SEKHUKHUNE DISTRICT, LIMPOPO PROVINCE

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(MINI-) DISSERTATION

Submitted in fulfillment of the

requirements for the degree of

MASTERS OF DEVELOPMENT

DISCIPLINE

in the

FACULTY OF TURFLOOP GRADUATE SCHOOL OF LEADERSHIP

at the

UNIVERSITY OF LIMPOPO

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2013

DECLARATION

I declare that the mini-dissertation hereby submitted to the University of Limpopo, for the degree of Masters of Development in the Faculty of Turfloop Graduate School of Leadership has not previously been submitted by me for a degree at this or any other university; that it is my work in design and in execution, and that all material contained herein has been duly acknowledged.

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ABSTRACT

The study was an attempt to evaluate the results of the revitalization of the smallholder irrigation schemes programme which was introduced by the Limpopo Department of Agriculture. The focus area was the Krokodilheuwel Irrigation Scheme in Makhuduthamaga Municipality which falls under the jurisdiction of Sekhukhune District. The nature of the study was qualitative and was conducted on farmers and technical staff as respondents within the irrigation scheme.

The research findings indicated that the majority of the farmers noted some improvements, especially on the management of irrigation schemes by farmers, provision of technical support from staff of the Limpopo Department of Agriculture and in terms of the frequency of training provided to smallholder irrigation schemes.

On the other hand, a problem was also observed on the side of management of income and expenditure which was not transparent and inclusive. Farmers were not involved in the management of income and expenditure, but only the strategic partner. Farmers were only told that they did not make any profit as the produce failed to cover for the expenditure incurred for that season. Farmers suggested that the Limpopo Department of Agriculture should be represented on the management of the irrigation scheme to monitor the running of the scheme. The researcher also recommended that the Limpopo Department of Agriculture should put up measures to monitor and evaluate the activities within the irrigation scheme to ensure that the revitalization programme is implemented according to the plans so that intended goals are realized.

ACKNOWLEDGEMENTS

I wish to extend my utmost gratitude to the following people for their assistance during the conduct of this study:

- Prof. A Belete for his professional supervision, kindness and patience applied during the study.
- Victor Netshidzivhani for his professional help as a research statistician.
- Farmers in the Krokodilheuwel Irrigation Scheme for their willingness to participate in the study.
- Agricultural Advisors from Limpopo's Department of Agriculture for their cooperation and patience.
- My wife, children, parents, brothers, sisters and nephews for understanding my absence from family activities and for motivating me when I was undertaking this study.
- My colleagues and friends, Sedupa M., Mothapo Matsatsi, Ngomane T. S. and Michael Buys for their motivation and support during the study period.

DEDICATION

I dedicate this study to my wife Ramatsobane Grace Ledwaba, my children Malesela Wilfred, Sefenya Charlotte, Ramadimetja Matilda, Mpho Paul and Khutjo Maria Ledwaba, my grand-children Matsobane, Thabiso, Tshepo and Thapelo Ledwaba, my parents Stephinah Ramasela and Malesela Elias Ledwaba and my brothers and sisters and their families.

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LIST OF ABBREVIATIONS

RESIS	-	Revitalization of Smallholder Irrigation Schemes
LDA	-	Limpopo Department of Agriculture
PTO	-	Permission to Occupy
IMT	-	Irrigation Management Transfer
WUA	-	Water User Association
DWAF	-	Department of Water Affairs and Forestry
SA	-	South Africa
UN	-	United Nations
RDP	-	Reconstruction and Development Programme
GEAR	-	Growth, Employment and Redistribution Policy
SMME	-	Small and Medium Enterprise
WUA-MC	-	Water User Association and Management Committee
NPDALE	-	Northern Province Department of Agriculture, Land and Environment

CHAPTER ONE: BACKGROUND TO THE STUDY

1.1 Introduction

The programme of Revitalization of Smallholder Irrigation schemes (RESIS) was started by the Limpopo Department of Agriculture (LDA) with the main objective being to ultimately transfer ownership of irrigation schemes to the farmers and place them on sustainable development basis. Before the transfer took place, the department committed itself to assist the communities with finance, equipment and technical know-how to revitalize the schemes. The communities were advised that they could be assisted only if the beneficiaries were willing and committed to take ownership of the schemes, and to contribute in kind during the revitalization process. The programme commenced in 1998 under the banner, “Planning and Implementation of Irrigation Schemes”. The main focus was to empower farmers to take ownership of their schemes, rehabilitate infrastructure, construct conservation works, and manage the infrastructure and conservation works properly (Limpopo Department of Agriculture, 2002).

The procedure was such that each community had to apply formally for assistance from the LDA. The department would then assist farmers to identify the revitalization needs of their schemes by conducting pre-development survey which focused on the socio-economic status of the community, their felt needs; problems; fears and aspirations; and technical evaluation of resources and infrastructure, which assessed the state of schemes’ infrastructure; the natural resources of the area, and the climate and the agricultural potential of each scheme. The farmers were assisted to establish appropriate management structures for the sustainable take-over and management of their schemes. Once the committees were in place and functioning, the rehabilitation of infrastructure commenced (Limpopo Department of Agriculture, 2002).

The programme started as Rehabilitation of Smallholder Irrigation Schemes. At a later stage, it was changed to “Water Care Programme” and, finally, in the year 2003 it became known as the “Revitalization of Smallholder Irrigation Schemes” (Limpopo Department of Agriculture, 2002).

1.2 Statement of the problem

Irrigation schemes in Limpopo Province were not profitable as expected even though established and constructed and run by the provincial government through parastatal entities. They relied much on state’s grants but not productive. They were unable to recover their running costs, which led to their collapse. Lack of realistic planning, poor extension support services from government officials, lack of farmer training on project management and crop production skills, poor infrastructure and lack of skills operating irrigation equipment were also amongst other factors which contributed much towards the decline of the projects (Veldwisch & Denison, 2007).

Denison & Manona (2006) described the initial situation of irrigations schemes as was characterized by underutilization of land and water, under production, land conflicts, weak institutions and collapsed infrastructure.

To improve the situation, the Limpopo Department of Agriculture introduced the revitalization programme which included a number of initiatives aiming at profitable irrigation, land trading, mix of farm enterprises, functional infrastructure, farmer involvement and increased production, (Denison & Manona, 2006).

According to Veldwisch & Denison, (2007) some farmers still felt marginalized by their strategic partners who took decisions for them without any consultation and as a result they did not enjoy ownership over the projects.

1.3 Aim of the study

The aim of the envisaged study is to evaluate the results of the revitalization of the smallholder irrigation programme focusing on Krokodilheuwel project. To analyse improvements and changes brought by RESIS on the irrigation scheme. The rationale for selecting Krokodilheuwel Irrigation Scheme was that it was already progressed to the production stage.

1.4 Objectives

In order to evaluate the results of the RESIS Programme, the envisaged research study will be required to achieve the following:

a) To analyse the improvement on infrastructure as a result of the introduction of the RESIS programme
b) To analyse changes with regard to management, land ownership, financial assistance, technical support, farmer training and increased production as brought about by the RESIS programme.
c) To analyse ineffective areas of the programme and give recommendations.

1.5 Research questions

The research questions to guide the envisaged study will include the following:

a) How was the situation at the project prior to the introduction of RESIS programme in terms of management, support services, skills levels, infrastructure and level of production?
b) What measures did the RESIS programme put in place to bring about changes on infrastructure and people to ensure sustainability of the project?
c) To what extent did the RESIS programme contribute towards the improvement of the project with regard:
    - Management activities
    - Land issue
    - Financial assistant

- Technical support services
- Training, and
- Level of production.

1.6 Definition of concepts

Irrigation Management Transfer (IMT) - refers to the strategy to transfer the responsibility of managing, operating and maintaining irrigation schemes from the state to farmers, (Vermillion, 1997, in Van Averbeke & Mohamed, 2006).

Revitalization of Smallholder Irrigation Schemes (RESIS) – The strategy is to empower farmers to be able to take ownership of their schemes; to rehabilitate infrastructure; to construct conservation works, and to manage the infrastructure and conservation works properly (Limpopo Department of Agriculture, 2002).

Water User Association (WUA) – it is a legal entity that has been established in terms of the New Water Act and registered with the Department of Water Affairs and Forestry. This is meant to enable farmers to operate as a legal entity, to access to the DWAF grant for any additional infrastructure rehabilitation that may be necessary (Limpopo Department of Agriculture, 2002).

1.7 Ethical considerations

During the study, the researcher ensured adherence to all ethical issues. Respondents were informed and briefed in advance in order to decide to participate voluntarily without being coerced. The purpose of the study was explained to the respondents. Respondents were treated with respect. They were also told to withdraw from the interview at any stage, should they feel uncomfortable.

The identity of respondents was duly protected and all their particulars do not appear anywhere in the study. Their privacy, confidentiality and anonymity were respected.

1.8 Significance of the study

It is expected that the envisaged study will contribute towards identifying the areas where revitalization activities have taken place and the improvements brought about, specifically at the selected irrigation scheme. The conclusions and recommendations will be utilized as additional inputs and or corrective measures towards the achievement of the intended goals.

1.9 Outline of the research study

The report of the study will be structured as follows:

Chapter 1: Background to the study

Chapter 2: Literature Review

Chapter 3: Description of the Krokodilheuwel Irrigation Scheme

Chapter 4: Research Methodology

Chapter 5: Analysis and Interpretations of the Research Findings

Chapter 6: Summary, Conclusion and Recommendations

1.10 Conclusion

The purpose of the chapter was to outline the background of the study where a clear explanation of how the programme was introduced within the Limpopo Department of Agriculture. The dynamics of the revitalization programme have been described and the main aim of the project explained, which is empowering farmers to manage their irrigation schemes, rehabilitation of the infrastructure and conservation work. Initially the irrigation schemes were sponsored by government, but later the schemes failed to sustain themselves and eventually collapsed, mostly due to lack of skills on project management and production methods.

As has been pointed out earlier, the purpose of the present study was to evaluate the impact of the revitalization of smallholder irrigation schemes by looking at the Krokodilheuwel project located in Makhuduthamaga Municipality, Sekhukhune District. The next chapter will review the literature on the subject of the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

According to Backenberg (2006) the term “smallholder irrigation scheme” is described as agricultural irrigation infrastructure which is mostly practiced by black people in South Africa. De Lange *et al.* 2004 cited in Van Averbeke & Mohamed (2006) describe smallholder irrigation farmers as those who practise farming on very small plots mainly to provide food for home consumption and also referred to as independent irrigation farmers, farmers on irrigation schemes, community gardeners, or home gardeners.

According to the edition of SA Irrigation December 2005 – 2006 farmers were confused by the introduction of technology in agriculture. Some leaders advised them to return back to basic knowledge and skills. They suggested that the current technology should be analyzed, and utilized only where it is economically viable. Farmers should utilize technology in order to get the best yields out of nature.

Comments by Chris Barnard in the edition of SA Irrigation (2004) indicate that technology has a role to play, but should be rooted in basic knowledge. Farmers should not feel inferior that they cannot operate a laptop to implement highly technological software packages, for example, but should re-assess their practices and only install irrigation systems that are cost-effective and require the minimum management. He believed that new technology should be easy to grasp and use.

2.2 History of South African smallholder irrigation schemes

The history of smallholder irrigation schemes in South Africa was largely influenced by the government policy of racial segregation and the irrigation technology used. These included eras such as, the Peasant and Mission Diversion Scheme era; the Smallholder Canal Scheme era; the Independent

Homeland era, and the Irrigation Management Transfer and Revitalization era. Each era is subsequently discussed hereunder:

2.2.1 The Peasant and Mission Diversion Scheme Era.

Evidence on the ground clearly confirmed that irrigation development was an innovation which came after colonialism. This was the first era of smallholder irrigation development in South Africa introduced during the 19th century. It was referred to as the Peasant and Mission Diversion Scheme era because it was associated with mission activity and the emergence of African peasantry (Bundy, 1988).

According to Backeberg and Groenewald, 1995 the era coincided with the early part of Individual Diversion Scheme era where irrigation development was private and the technology used was that of river diversion which is similar to the peasant era. The area under irrigation production was less important in this era until the irrigation schemes that were developed seized to function by the end of the 19th century.

2.2.2 The Smallholder Canal Scheme Era.

This era started from 1930 until 1960 and was regarded as the renewed smallholder irrigation development which took the form of canal irrigation. According to the national history of development described by Backeberg and Groenewald (1995), this era coincided with the era of public storage schemes. Bruwer and Van Heerden (1995), referred to the second phase of this era as the Great Depression and the Second World War, because these schemes were constructed during the Second World War.

The smallholder canal schemes were largely aimed at providing African families residing in the so-called “Bantu Areas” with a full livelihood. The so called “Bantu Areas” were areas demarcated for black people, created by the Land Act of 1913 and the Land and Trust Act of 1936, which restricted land

ownership by blacks in South Africa (The Commission for Socio-Economic Development of the Bantu Areas within the Union of South Africa, 1955, hereafter referred to as The Commission, 1955).

The Smallholder Irrigation Land era was also described as the time when irrigation projects obtained their water from the river and built storage dams by means of concrete water weir diversion and concrete canal conveyance system. Schemes with both smaller and larger plots were found. The era was also characterized by black people being allocated smaller plots of 1.5ha to 2ha, whereas 8ha to 20ha were allocated to the so-called poor white settler farmers for full land-based livelihoods. The manner in which the plots were allocated (smaller for blacks and larger for whites) suggested that black families required less land and less income to attain a full livelihood than white families, (Benbridge, 1997; van Averbeke *et al.,* 2006; Bruwer and van Heerden, 1995; Backeberg and Groenewald, 1995).

Most of the irrigation canal schemes of this era were developed on the land that belonged to the state and farmers held their plots by means of Permission to Occupy (PTO), which empowered the state to prescribe the manner in which land could be used and to expel and replace those farmers who did not comply with state rules (Van Averbeke & Mohamed, 2006).

During this there was no farmer involvement but only the state was in control. Land trading was not allowed. Farmers were utilizing the land according to instruction by the state. Challenges with this era contributed towards the realization of RESIS.

2.2.3 The Independent Homeland Era

The Independent homeland era is the third period of irrigation development, which lasted from 1970 until 1990. It was regarded an important era of the economic development of the homelands. It was during the apartheid policy of

post-World War II which aimed at classifying citizens of South Africa in line with independence homelands, i.e., each homeland was to cater for a particular cultural language group. In trying to make the independent homelands system acceptable, it became necessary to improve their economy (Beinart, 2001).

The other key strategy of the homelands system was to fund the development of irrigation schemes from the South African Government because agriculture was regarded as the main internal development opportunity for the homelands and their resource base remained essentially rural (van Rooyen and Nene, 1996 and Lahiff, 2000).

The types of irrigation methods used were characterized by modernization, functional diversification, and centralization of scheme management. According to van Averbeke *et al.* (1998) the modern irrigation system was utilized in large schemes of >500ha which were found mainly in the Eastern Cape. On some of the smaller schemes, the pressurized overhead irrigation systems were utilized instead of surface irrigation. The functional diversification was used for rural homesteads and provided different options to benefit from irrigated agriculture, depending on the structure of their existing livelihood. For instance, mini farms catered specifically for homesteads that sought full land-based livelihoods, and the food plots provided homesteads that derived their livelihoods from external sources such as male-migration or old-age pensions with an opportunity to enhance these livelihoods by producing food for home consumption. The estate component offered opportunities to members of rural homesteads who were searching for employment and monetary income close to home. Management of these large schemes was centralized in the hands of specialized parastatals (van Rooyen and Nene, 1996; van Averbeke *et al.,* 1998; Lahiff, 2000).

There were also very large schemes which were developed during the Independence Homelands era which were socially and economically complex and costly to maintain. Their sustainability was affected by the social unrest and

the conflicts of the late 1980s. These agricultural parastatals were dismantled by the provincial governments immediately after the democratization of South Africa in 1994. Large schemes were mostly affected and their production collapsed due to their complexity and centralized management since their establishment (van Averbeke *et al*., 1998; Bambridge, 2000; Laker, 2004).

2.2.4 The Irrigation Management Transfer (IMT) and Revitalization Era.

The Irrigation Management Transfer and revitalization era started around 1990 when political change in the country became inevitable. This is the most recent era which was guided by the ideals of democracy and a better life for all. The era was aimed at eradicating poverty and improving the quality of life among black people in rural areas and informal settlement, (van Averbeke and Mohamed, 2006).

The IMT was initially pursued through the Reconstruction and Development Programme (RDP) which focused more on food security at community or group level, favouring the establishment of small schemes. According to statistics by Arcus Gibb, (2004), 64 new irrigation schemes were established during this era, adding to 2400 ha to the total smallholder irrigation scheme area. The irrigation methods used at the schemes included mechanical pump and sprinkler technology. During the time of political changes, between 1990 and 1994, the Independent Development Trust took over the funding of these types of project and later followed by provincial departments of agriculture, Health and Public Works as organs of the state (van Averbeke and Mei, 1998).

The overall development policy of South Africa changed from RDP to Growth, Employment and Redistribution Policy (GEAR), which aimed at pursuing economic growth through private sector development. Existing irrigation schemes were identified as important resources for economic development which needed revitalization first. The IMT era was related to GEAR because it promised to improve the lives of poor people by means of a process that

empowered them to take control over their own resources and destiny, (van Averbeke and Mohamed, 2006).

According to Perret (2002), the Irrigation Management Transfer period was characterized by four issues. The first was that the original design and aim of most smallholder irrigation schemes were subsistence oriented, using inexpensive designs that aimed at subsistence farming through surface irrigation (e.g., furrows to convey water from a weir or a dam). The second issue was that there was very little participation by irrigators from the beginning, no local organization, and most land rights were granted to men, while women were the actual irrigators. This was also called the smallholding irrigation families period, when land rights were granted to men who became migrant labourers, relocating to cities, mines and industries and leaving women and pensioners behind to remain in the homesteads and scheme holdings to carry out extensive food crop and livestock farming, with weak or unclear property rights on land and water resources. The third issue was heavy operation and maintenance costs in most schemes, but still most irrigators were subsistence farmers in a weak agribusiness environment. High costs were due to the introduction of sophisticated technologies such as pumps and sprinkler irrigation at certain schemes by hired consultants because of infrastructure degradation. The fourth and the last issue of IMT was the withdrawal of any support in most schemes by provincial governments. The withdrawal was based on the fact that some of the established irrigation schemes were declining and others had not been active for a very long period of time due to the following:

- Infrastructure deficiencies emanating from inappropriate planning and design;
- Poor operational management set up;
- Inadequate technical know-how and capacity on the part of the beneficiaries as well as government assigned extension officers;
- Lack of people involvement and participation;
- Inadequate institutional structures, and

- Inappropriate land tenure arrangements.

2.3 Introduction of the Revitalization of Smallholder Irrigation Schemes (RESIS) in Limpopo province.

The revitalization process started from rehabilitation and later changed to revitalization. Rehabilitation was infrastructure driven style of intervention than “revitalization”, which is much broader based intervention covering a wider range of activities linked to successful small-scale irrigated agribusiness, which include enterprise planning, human capital development, empowerment and access to information, repair and redesign of infrastructure. (Veldwisch & Denison, 2007).

According to De Lange (2004), the RESIS programme in Limpopo Province started around 2004 with workshops where the implementation plans for the existing and new irrigation schemes were discussed. The management skills required for irrigation schemes were learned during the Water-Care Programme which formed the basis of RESIS implementation plans. In establishing scheme structures and ensuring that irrigation schemes were managed by farmers, the scheme facilitators were empowered to elect farmer management committees to take charge of scheme management. These committees played active roles such as capacity building exercise and on-the-job training to enable smallholder farmers to develop into fully-fledged agricultural producers, marketers and managers.

The success of RESIS would be evaluated or seen by the success of farmers in producing more and making much profit to sustain their schemes, hence more focus was put on farmers training and capacity building. An established Departmental Training Team was put in place to train new farmers to roll out RESIS activities. Members of the team were mostly from agricultural colleges within the province serving as lecturers. These lecturers were released from

their current duties and concentrated on farmer training as from June 2004 (De Lange, 2004).

The RESIS implementation plan was approved in November 2004 and focused on the infrastructure rehabilitation which recognized the need to change designs and emergency repairs on the current infrastructure of the irrigation schemes to enable management-by-the-farmers to plant crops. At that moment, the departmental engineering team had insufficient capacity to do the engineering designs for RESIS roll-out and therefore the service was outsourced. The proposed designs of infrastructure on the existing Water-Care schemes was made and checked that they had been adapted for management-by-the-farmers and that the expected operation and maintenance costs were reasonable and affordable to the smallholder farmer (De Lange 2004).

Access to inputs and outputs markets such as mechanization services, produce markets and other factors of production became very important to the success of RESIS. The creation of SMME around the schemes to stimulate local economic growth was one of the strategies together with forming joint ventures to have a stable supply of particular commodities (De Lange 2004).

2.4 Stages of the revitalization programme in the Limpopo Province

The revitalization programme started in 1978 with a Water-Care Pilot Programme (Phase) at Thabina, Boschkloof and Morgan Schemes, finishing in 2001. The second Water-Care Programme was the “Mega Plan 1”, which involved 5 schemes at Metz, Madeira, Capes Thorn, Dingledale and New Forest which started in 2000 – 2002. The third stage was Mega Plan II and III at Ndzhelele, Makuleke, Matsika, Homu and Tshwelopele schemes in 2002 – 2004. Currently there was a programme which started in 2003 running until 2010, (Veldwisch & Denison, 2007).

2.4.1 The Northern Province Irrigation Scheme Project – The Pilot Phase

The Pilot Phase was conducted by Veldwisch & Denison in 2007 with the main aim to gain experience and to further develop an appropriate approach of revitalizing irrigation schemes. The programme was conducted at Thabina Irrigation Scheme to analyze the effects of revitalization that had been done already.

The overall aim of the revitalization exercise in Thabina was to get the irrigation scheme running again mainly through rehabilitation of infrastructure, i.e., carrying out repairs and some minor upgrades on the physical infrastructure. Other objectives included opening the way for a transfer of the ownership of the schemes to its beneficiaries and ensuring that they are operational and providing capacity building and training which were also seen as crucial elements in the turnover strategy (Veldwisch & Denison 2007).

Veldwisch & Denison (2007) concluded by indicating the successful aspects of the rehabilitation programme which included the following:

- The problems, needs, fears and aspirations listed by farmers as their main concerns during the consultative pre-development study which were confirmed by information obtained from the fieldwork;
- The Management Committee has been established and is fully functional, especially on external relations with extension officials, researchers, provincial government, and the Department of Water Affairs & Forestry;
- Some people saw improvement in water availability as compared to the situation prior to rehabilitation;
- More people felt that the agricultural training received had been helpful and improved their yields significantly, and
- Government expenditure had also been reduced as a result of transferring many workers to the schemes.

The areas of concern or difficult areas observed by farmers during the rehabilitation programme at Thabina Irrigation Scheme included the following:

- The feeling by the farmers that during the participatory pre-development study, decisions had been made for them rather than by them and therefore that feeling of ownership over projects did not exit.
- The composition of management committee was largely dominated by commercial farmers with large portions of land who took decisions on behalf of small subsistence farmers who felt marginalized. This created a big gap between management committee and the rest of the farmers.
- According to Permission to Occupy land tenure, farmers who were no longer interested in farming should vacate that land, but in Thabina that was not the case and such people still occupy the land.
- Farmers did not get any credit or financial support to run their projects (Veldwisch & Denison, 2007).

2.4.2 The Water-Care Programme – Mega Plan III

The programme ran from 2002 till the beginning of 2004 and included the following: mapping and re-enforcing the commodity relations; problem identification and prioritization; establishing a local management body; hands-on training on project and scheme management; follow-up: a period of mentorship, and looking back.

In this phase, the Limpopo initiative was aimed at a broader range of revitalization activities than the previous pilot phase. In addition to the rehabilitation of irrigation infrastructure, greater emphasis was now placed on farmer training; establishment of a Water User's Association (legal and constitutional); collective organization around water-use practicalities (practical and organizational), and subsequent transfer of management responsibilities and ownership of the facilities to the Water User's Association (WUA), (Denison and Manona 2006).

As a matter of fact, the basics of the two approaches, the Pilot Phase and the Mega Plan III are mainly the same but only differ in that with the Mega Plan III there was a larger budget and more time to go through the process of transformation in both social and technical arenas. Time invested in soft activities increased from 10% to 40% (Denison and Manona 2006).

An inclusive approach which considers all the necessary activities required for the success of irrigation schemes should be introduced. These include finance inputs infrastructure, markets, institution building and crop production information. Investing in human capital development such as skills and capacity development should be prioritized and infrastructure should be considered later. The total project cost relating to infrastructure must not go beyond 60%. The costs on human capital development which include farmer training, institution building, negotiation skills, marketing, mentoring and planning must be a major budget item amounting to 40% of the total budget. In terms of decision-making, plot holders who include women should be at the centre of planning and implementation of decisions. Women are responsible for about 65% of farming activity in the irrigation sector, and therefore should not be sidelined (Denison and Manona 2006).

According to Denison and Manona (2007), the reason many smallholder irrigation schemes in the former homelands collapsed was that too much emphasis was put on repair, rebuilding, re-designing, refurbishing and rehabilitation. This situation was to be redefined and replaced by a combination of infrastructural and social intervention. Technology was found to be the only one out of eight critical elements required for successful change in irrigation schemes. In terms of the guidelines of the research, all irrigation schemes must be viewed as complex systems if successful outcomes are to be achieved. All elements which are historical, social, technical, financial, institutional, land ownership and crop production are inter-dependent and affect each other.

Therefore, in planning the revitalization of the irrigation scheme, all the said elements should be considered as a whole system.

In her budget speech for 2005/06, the former Member of Executive Council (MEC) for Limpopo Department of Agriculture, Dikeledi Magadzi, indicated that her department was not merely concentrating on rehabilitating or fixing up broken infrastructure, but revitalizing, which means dealing with a comprehensive programme that involved:

- Re-structuring, training and capacitating smallholder farmers to run and manage their schemes profitably in a sustainable way;
- Evolving institutional formations to ensure management sustainability;
- Transforming from top-down approaches of the past, to self-management and the user-pays principle, which is the policy of the present democratic government;
- Investing in water-saving technology to improve farmer competitiveness and thus productivity;
- Providing access to roads, stock watering and rainwater harvesting facilities to enable households to use water for economic activities, and
- Applying the user-pays principle, promoting land rentals, contract farming to secure markets commodity approach to project development as well as utilizing local manpower to irrigation system installation.

The positives from the plan included the following:

- The training of management committee on project management and continuous support to take ownership over the project assisted people to start taking an active role in project planning together with consultants and government.
- Leaders of projects gained substantial experience in managing both projects and their irrigation schemes. Management committee became aware of the importance of keeping the community informed and well represented in decision-making e.g., at Makuleke Project the assistant trainer is now partly

employed by the management committee to keep informing the whole community about what is going on in the irrigation scheme.

- The problem identification and prioritization process which was made broad by involving almost everybody, made farmers aware of what is going to happen. People felt being part of the decision making process and started to support the project (Veldwisch & Denison, 2007).

The following challenges were also realized in the process:

- The widened approach of the RESIS which has gone beyond physical rehabilitation of the infrastructure and included agricultural, personal development (empowerment) and managerial training had become a stumbling block towards understanding the integrated nature of social, managerial and technical issues.
- The role of the extension officer was not clearly provided for in scheme development and evolution. The revitalization Programme should address the capacity building within the Limpopo Department of Agriculture that is necessary to allow a phase-in of ongoing support and mentoring to the scheme after the departure of external consultants.
- The establishment of WUA which was responsible for all agricultural production functions and scheme level water and organizational functions were not applicable to all irrigation schemes. At certain schemes the environment should be made conducive to all for the formation of farmers' organizations that are more flexible and accommodate more effectively the dynamic and diverse nature within and between schemes.
- The RESIS programme has always been in favour of commercialization to justify the investment and operational costs of irrigation schemes. The challenge was to find ways to provide those who are not willing or not able to commercialise a fair chance to continue farming in their preferred way. As an alternative some resources from the revitalization initiative should be allocated to working in surrounding villages on home gardens to address the need for home food production. Water-harvesting, tank-building,

intensive gardening methods and similar well-established approaches are available to achieve that.

- The former MEC for Limpopo Department of Agriculture mentioned water scarcity as another major concern in the province. The department would then have to utilize water more efficiently and effectively by applying water-saving technology and high-value use crops when revitalizing the irrigation schemes. The “More Crop More Profit per Drop” slogan would be experienced in the schemes. Bulk water supply and in-field water-saving irrigation technology would be installed as part of the efforts to accelerate delivery. Vandalism and community conflicts have also been worrying challenges which made it very difficult to finalize and operationalize some projects (Former MEC Magadzi, Limpopo Department of Agriculture, 2008/09)

2.5 Conclusion

It has been clear in this chapter that infrastructure development alone or as a dominant part of the intervention is highly unlikely to succeed. Farmers in smallholder irrigation schemes need support systems that go beyond just the irrigation system if they are to improve their livelihoods significantly. Focusing on engineering and infrastructure driven programmes have substantially increased chances of failure. With interventions that are based on comprehensive strategies addressing the complex of activities which include markets, finance, inputs, infrastructure, institution-building and crop production information, which make up the irrigation scheme, are most likely to succeed. Those projects which have paid equal attention to the infrastructure (hard components) as well as the social and institutional systems (soft components) were successful. Access to reliable water and security in land tenure are also important factors for successful and sustainable improvement in irrigation farming.

CHAPTER THREE: DESCRIPTION OF THE CASE STUDY PROJECT - KROKODILHEUWEL

3.1 Introduction

This chapter describes the irrigation scheme which was used as the case study. The infrastructure prior to and after the introduction of RESIS will also be described.

3.2 Description of Krokodilheuwel Irrigatrion Scheme

The scheme is situated in the Sekhukhune District, within Makhuduthamaga Municipality in Limpopo Province. It is next to the Lepelle River (Olifants) some 8km downstream of the Flag Boshielo Dam. It covers the total area of approximately 243 ha of irrigated fields with 35 farmers. The village next to the scheme is called Krokodiheuwel with 400 households and 2500 population within the area of Chief Mampana**, (**BKS, August & September 2005)

According to the Pre-Development Survey Report prepared by Golder Associates in July 2004, the needs of the community were identified as:

- Proper working and sustainable scheme
- More land to plough
- Reliable water supply
- Water for irrigation
- Sprinkler irrigation
- Extra pump for stock water
- Water in grazing camps
- Extension Officers to help technically

The scheme falls in the summer rainfall region of South Africa and can be classified as a semi-arid region. Its rainfall increases from September, peaking in December/January and then decreasing towards the winter months. The

summers are hot and winters are cold. Frost occurrence is very rare, (BKS, August & September 2005)

The farmers organized themselves to form a committee called The Krokodilheuwel Water Users Association which was sub-divided into sub-committees. Members of the sub-committees required more training in management activities and therefore a training programme was developed on the following subjects: understanding your project; the roles and functions of the management committee; project cycle management; identification and prioritization of project management gaps/problems; the project planning matrix; management and leadership skills; basic bookkeeping; development of the community as a group within the project; conflict resolution; Joint Venture & partnerships and day/operation management, (WSM, August 2006)

3.3 Project infrastructure

The following table describes the comparison of infrastructure prior to and after the introduction of RESIS in the Krokodilheuwel Irrigation Scheme, (WSM, July 2006):

Previous Situation	Current Situation
a) Water Source	
The water supply is from the Lepelle River and Makotswane (Lola Montes) Dam. The main bulk water infrastructure in the Flag Boshielo canal conveys water from the river pump station at Coetzeesdraai to this scheme and other schemes. Secondary canals and furrow system were used plus infield furrow and basin flood irrigation system. There was no management structure in place to manage the main bulk water canal, control water releases and organize the general maintenance of the system.	The main water pipe from Flag Boshielo Dam was improved and repaired. The floppy irrigation system was installed to replace the canal systems around the entire scheme. Currently there is a management structure in charge of the system and maintenance.

b) Fencing	
The perimeter fence around the scheme was in a fair but poor condition with 6 strands of wire and informal pedestrian crossing. The old fence and gates at pedestrian crossing required to be replaced and new gates be added where necessary.	A new fence has been erected only around water dams.
c) Electricity Supply	
Electricity supply did not exist at the scheme but has been supplied to the houses in the nearby village. An application with the design of electricity supply was to be submitted to ESKOM.	Electricity has been supplied at the entire scheme.
d) Pump Stations	
There was only one water canal from Mogalatsana which needed some upgrade. A secondary canal and furrow system was also used.	The water system has been improved by constructing new 5 pump stations in the project.
e) Access Roads	
There was only one access road which was in a poor form due to lack of maintenance. Re-gravelling the access road was needed.	More access roads have been constructed and are maintained regularly.
f) Balancing Dams	
The irrigation scheme consisted of a flood irrigation scheme covering an area of 243 hectares with four (4) balancing dams that are supplied with water from Flag Boshielo canal. Most of these balancing dams are filled with sand and mud.	Balancing dams have been improved with new machines which are maintained regularly, but there is no security to protect the machines.
g) Operation and Maintenance	
Operation and maintenance plans did not exist at the scheme. Manuals were required to be drawn up.	Water supply system is operated by the farmers themselves, but there is no maintenance since it was installed
h) Communication	
There were no Telkom landlines in the scheme and village. The only means of communication was via cell phones	Same situation as before

3.4 Conclusion

The status of the Krokodilheuwel Irrigation Scheme has been clearly described to have an understanding its status quo prior to the application of RESIS interventions**.** The description was on the basis of location of the scheme, size of its area, source of water, number of famers involved and the village nearby and its total population.

The needs of the community prior to the introduction of RESIS were identified and some included: properly working schemes which are sustainable, more land to plough, reliable water supply, water for irrigation, sprinkler irrigation, extra pump for stock water, water in grazing camps and extension officers to help technically.

The climatic condition of the area was also described. The status of the infrastructure prior to and after the RESIS interventions was described. The aim of description was to understand the current status of the scheme and to compare it with the future so that changes can be observed.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

This chapter outlines the research design of the study, the area of study, the population, the selection methods of the sample and size.

4.2 Research Design

A qualitative research design has been utilized in the present study because the study was aiming at evaluating the effectiveness of the RESIS programme. The research followed a case study approach which focused on Krokodilheuwel irrigation scheme to analyze the impact brought about by the introduction of RESIS.

4.3 Area of study

The study was conducted in Limpopo Province, specifically in Makhuduthamaga Municipality located in Sekhukhune District. The Krokodilhuewel Irrigation Scheme was selected for this study because it has already passed all the stages of revitalization and is now at production stage which enabled the researcher to do the evaluation of the project.

4.4 Population

The study was conducted on individual participant farmers and two agricultural advisors from the Limpopo Department of Agriculture responsible for providing technical support. A self-administered questionnaire was applied to a total population of 35 participant farmers who were all included in the study.

4.5 Data collection methods

Data collection methods utilized in the research included document analysis, structured interviews and a questionnaire. Some information was collected through the observation method to confirm the type of infrastructure installed, type of crops, and condition of buildings.

4.5.1 Documentations

Data were collected from master plans compiled for the smallholder irrigation schemes of the RESIS recharge programme in Sekhukhune District. These were compiled by a company called BKS during September 2005. Others included a Business Plan for the Revitalization of Smallholder Irrigation Schemes in the Limpopo Province, and other smallholder irrigation schemes related documents within South Africa.

4.5.2 Structured interviews

Some data were collected through structured interviews and a questionnaire from officials from the Department of Agriculture who act as advisors to the farmers in the irrigation schemes. The researcher set a number of questions which were presented to the respondents to give answers. Upon realizing that some data were missing, the researcher added more questions to help get more clarity from the respondents. The reason for utilizing the structured interview method was that the departmental staff did not have the time and interest to fill in the questionnaire.

4.5.3 Questionnaires

More data were collected from participant farmers working in the irrigation scheme through self-administered questionnaire. The language used on the Questionnaire is English, but the researcher translated it to Northern Sotho when conducting interviews as most of participants were not proficient in English.

Questions were structured to evaluate the situation of the scheme and participant farmers before and after the introduction of RESIS. Self-administered questionnaire was preferred because the education levels of the respondents were not known to the researcher.

4.6 Data analysis methods

The collected data were prepared according to field notes and transcripts from the questionnaire. A plan was designed for descriptive analysis and presentation with assistance of the statistician from the University of Limpopo, main campus. The data were sorted, organized and coded on Excel and analyzed, interpreted, and presented accordingly.

4.7 Conclusion

The chapter explained the manner in which the study was conducted. The research design used is qualitative research. The study was conducted in Krokodilheuwel and its population of 35 participant farmers and 2 agricultural advisors were interviewed to obtain their views on the impact of RESIS. The population was so small that sampling was not even considered, which means the total population was used for the study. Data collection methods used in the study included observations, documentation, structured interviews and self-administered questionnaire. In analyzing data, the expertise of a statistician from the University of Limpopo, main campus was utilized.

The next chapter will focus on the analysis and interpretation of the research findings.

CHAPTER FIVE: ANALYSIS AND INTERPRETATIONS OF RESEARCH FINDINGS

5.1 Introduction

The purpose of the chapter is to present the research findings, analysis and interpretations of results. Results will be presented from the information obtained from the individuals farming in the irrigation scheme and the departmental officials involved in providing technical advice to farmers in the scheme.

5.2 Presentation analysis and interpretation of results

Thirty-five (35) smallholder farmers who are farming in the irrigation scheme were interviewed through self-administered questionnaire. Structured interviews were also conducted to two (2) Agricultural Technicians who are responsible for provide advisory services to the farmers in the irrigation scheme. Data were collected during the months of August and September 2011. Farmers were interviewed on section A and B.

5.2.1 Section A – Socio-Demographic Variables

The purpose of this section is to evaluate the socio-demographic variables of respondents involved which include their age, gender, previous employment status, income on previous employment, grants, period of farming in the project, type of farming and type of crops.

5.2.1.1 Age

The aim of probing the age was to determine the age groups of farmers involved in the irrigation scheme. The results were as follows:

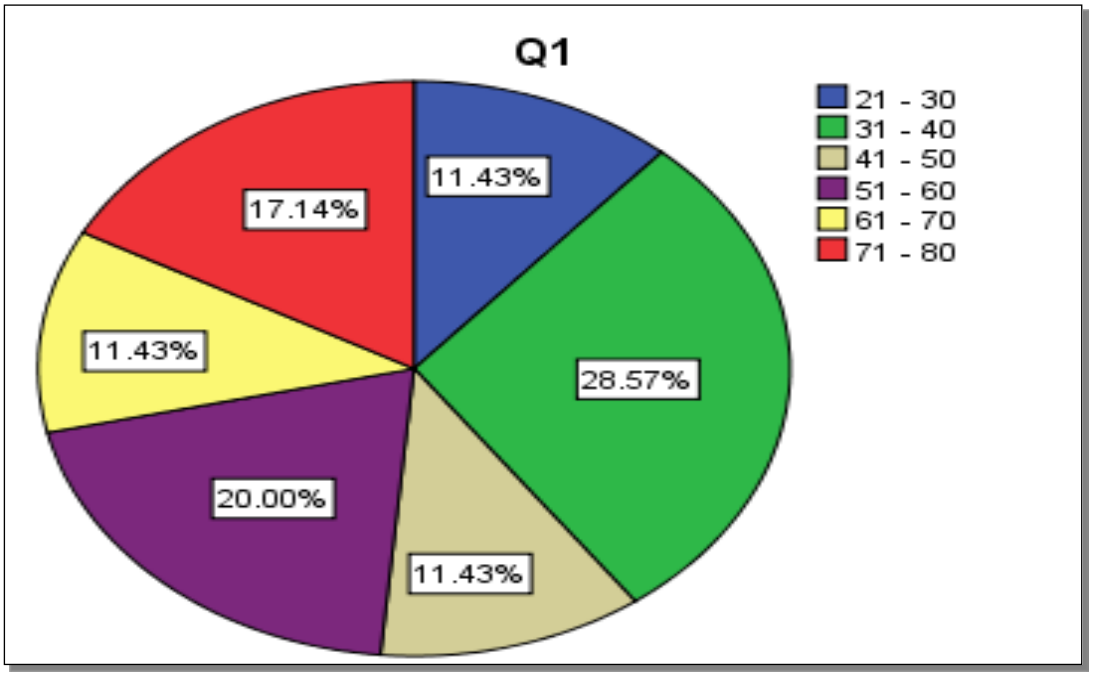

Figure 1: Age of Respondents

The research findings show that a large number of farmers 29% falls within the ages of 31and 40 years, followed by 51-60 years at 20% and 71-80 years at 17%. The remaining ages of 21-30, 41-50 and 61-70 all falls within 11%. The results indicate that farming is for all age groups old and young as all age groups are represented in the chart.

5.2.1.2 Gender

The reason for probing sex was to determine whether smallholder irrigation farming is dominated by females or males. The results indicated in the following chart:

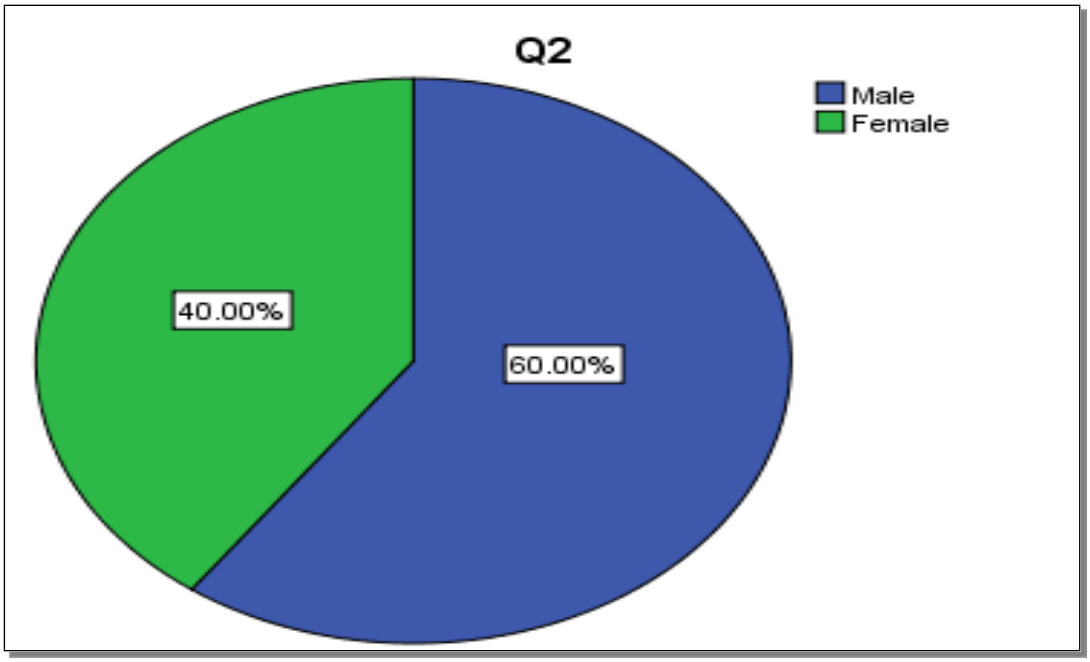

Figure 2: Gender of Respondents

The findings indicate that farming at this irrigation scheme is dominated by females at 60%. The reason for female domination could be that most men work far away from their homes and women are the ones left at home to take care of the children and do farming.

5.2.1.3 Levels of Education

Levels of education were probed to determine the academic levels of farmers in the irrigation scheme. The findings indicated as follows:

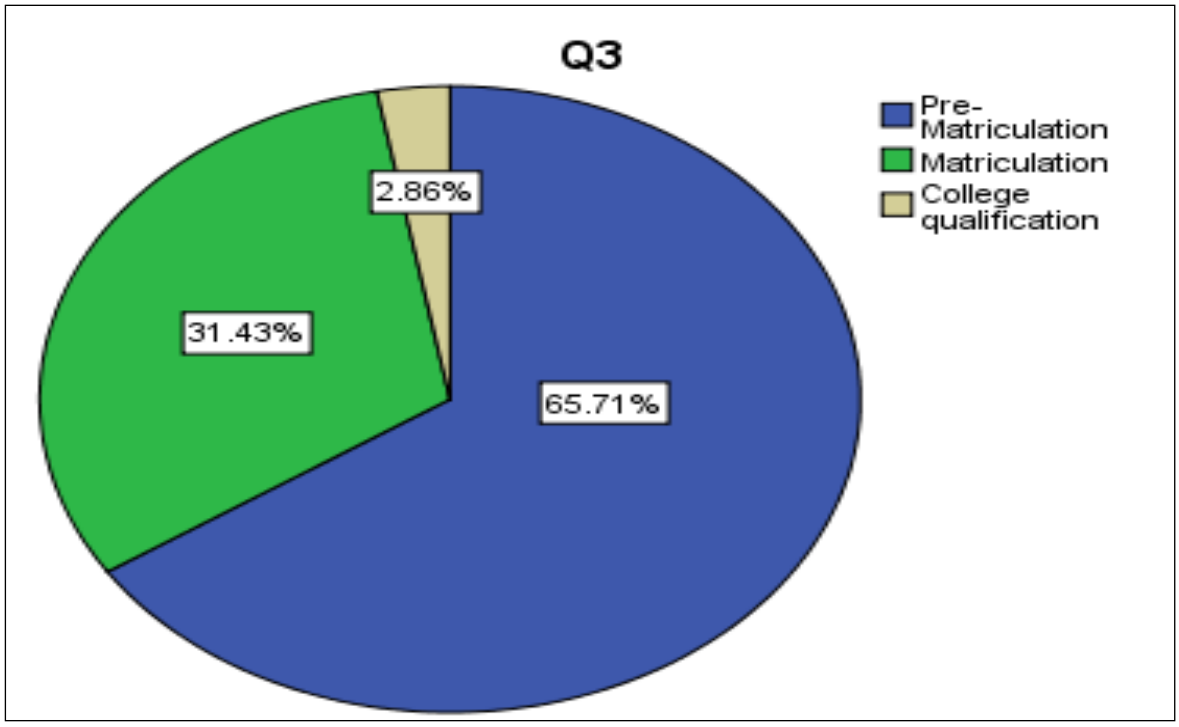

Figure 3: Respondents Levels of Education

The research findings show that 66% of farmers in this irrigation scheme are without matriculation. Those who passed matric certificate are 11 which is 31% of the total number. Only 3% achieved college qualification. These results indicate that people with better qualifications have also started to see farming as an alternative.

5.2.1.4 Previous Employment Status

The reason for probing previous employment status was to determine whether farmers were previously employed, and if that was the case to establish if it was part-time or full-time. The findings indicate the following:

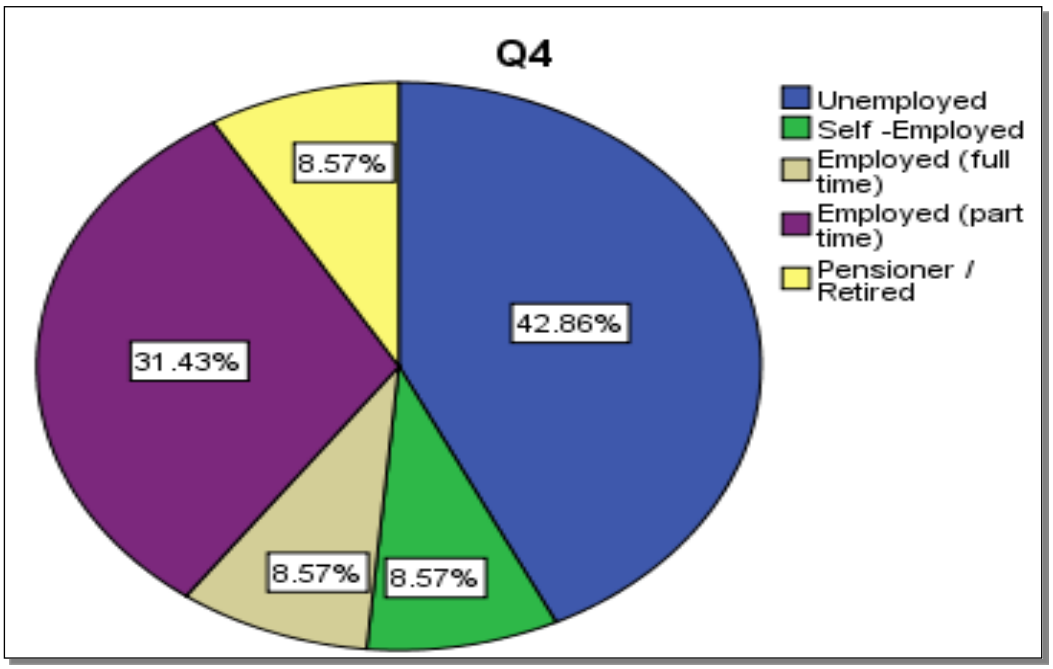

Figure 4: Previous Employment Status

The results indicate that 43% of farmers in the irrigation scheme were unemployed, followed by 31% who were employed on a part-time basis. Those who were self-employed, with full-time employment and retired are equal in number at 9% each. This shows that farming does create employment, especially to the unemployed. It is also an alternative employment to other groups who were previously employed.

5.2.1.5 Incomes at Previous Employment

The previous earnings were probed to determine whether there was improvement when compared to current situation in farming. The research findings indicate the following:

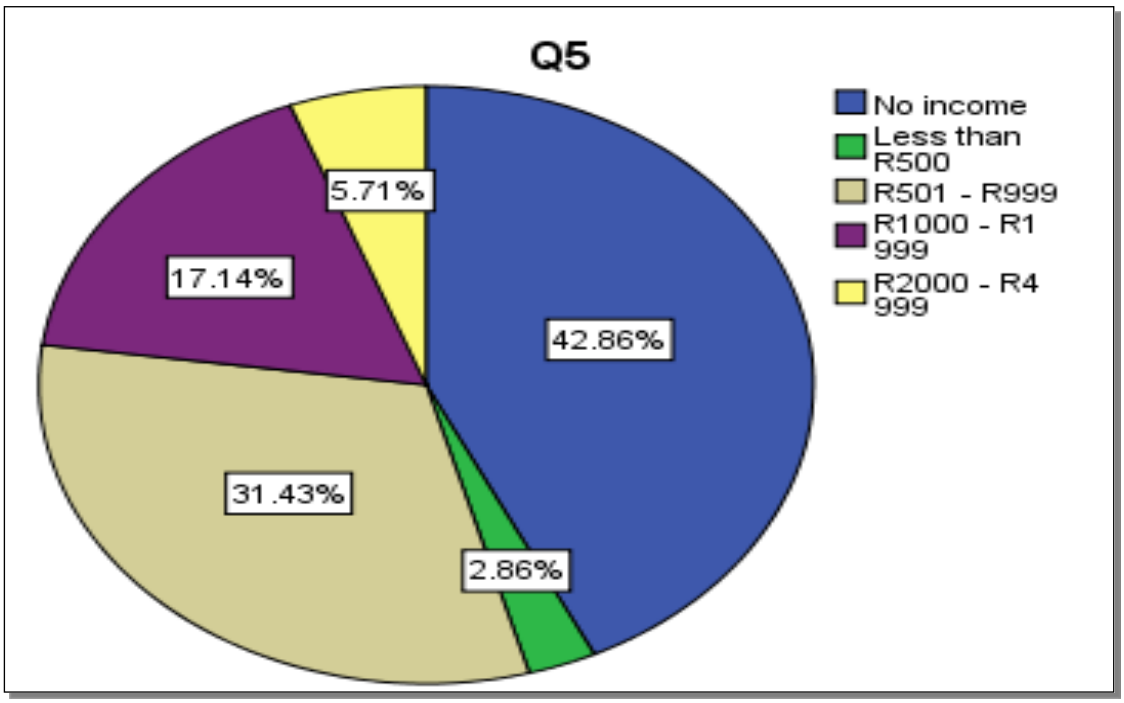

Figure 5: Respondents incomes at Previous Employment

According to the findings, 5.71% were earning more than R2000.00, followed by 17.14% who were earning above R1000.00. Those who earned below R1000.00 are approximately 34%, followed by 43% of those who did not have any income, which confirms their previous employment status, which is that they were unemployed.

5.2.1.6 Period of Farming

Years of farming was probed to determine the number of years farmers were involved in farming. The results are as follows:

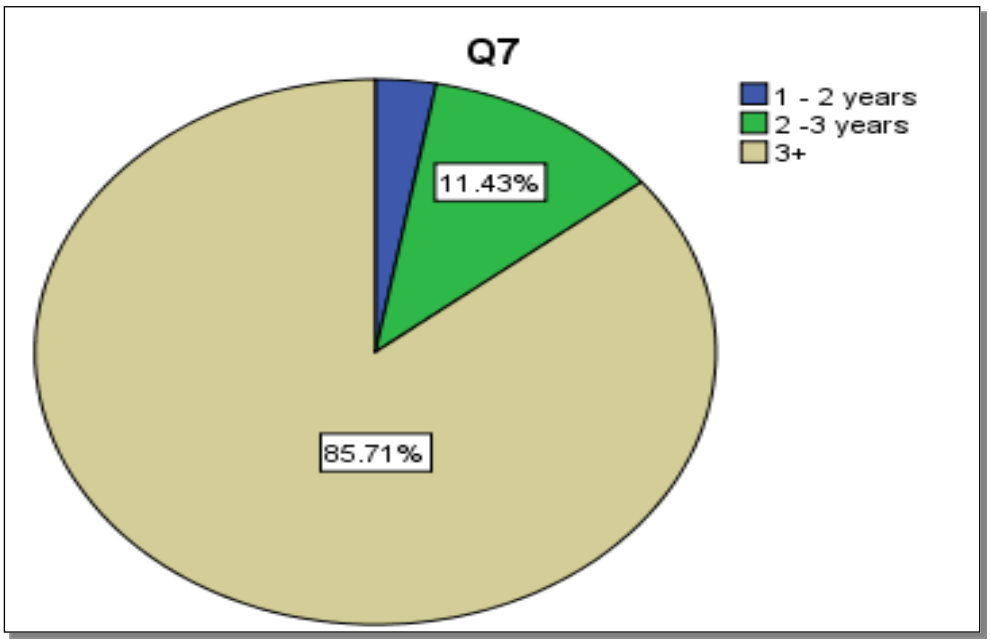

Figure 6: Respondents Period of farming

The findings indicate that a large number of farmers 86% were involved in farming for more than three years and only a small portion started farming less than three years ago. This is an indication that farming is the main occupation and a means of making a living in the villages surrounding the irrigation scheme.

*5.2.1.7 **Commercial or Subsistence Farming***

The purpose of farming was probed to determine whether farmers were farming for the purpose of making profit (commercial) or for home consumption (subsistence). The research findings indicated as follows:

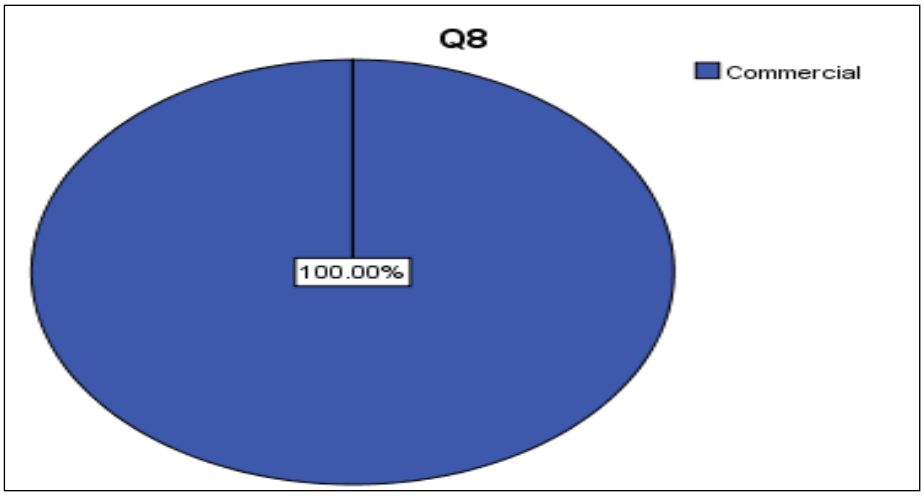

Figure 7: Purpose for farming

No farmer aimed at subsistence farming, but all 100% chose farming for commercial purposes. This is an indication that farming is now regarded as a business in this irrigation scheme and no longer aimed at producing for home consumption purposes.

5.2.1.8 Types of Crops

The reason for probing types of crops was to determine the types of crops farmers are involved in such as maize, vegetables, fruits etc. The research results are as follows:

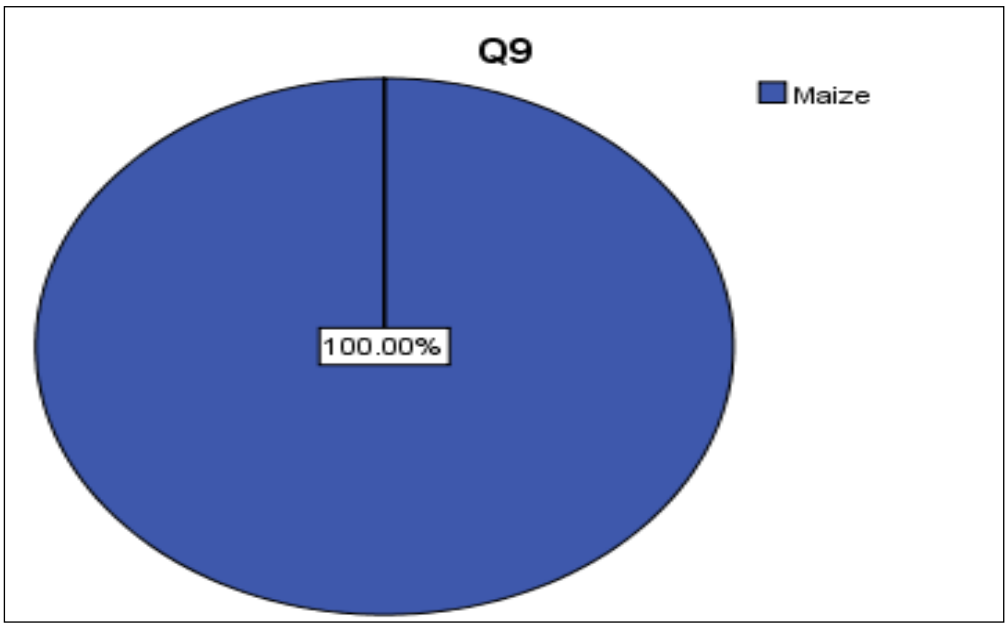

Figure 8: Types of Crops

The findings indicate that the irrigation scheme is 100% maize farming. This is informed by the type of soil and the advice from Agricultural Advisor from the Limpopo Department of Agriculture.

5.2.2 Section B: Comparison of the Scheme before and after RESIS

This section is aimed at evaluating the irrigation scheme by comparing the situation prior to and after the introduction of RESIS with regard to management practices, land ownership, financial assistance, technical support, production levels and training levels.

5.2.2.1 Management Status

The introduction of RESIS was aimed at ensuring that farmers manage the scheme by themselves or are involved in the management. This variable was probed to determine the involvement and representation of farmers in this regard. The findings show the following:

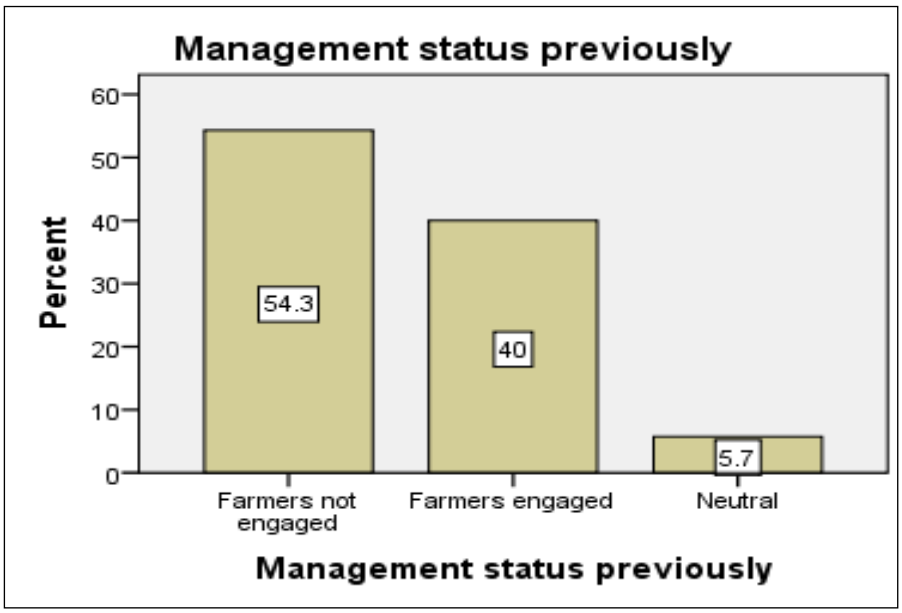

Figure 9 (a): Previous Management Status

The results indicate that a large number of farmers (54.3%) say previously farmers were not engaged in management activities, while 40% indicate that they were engaged.

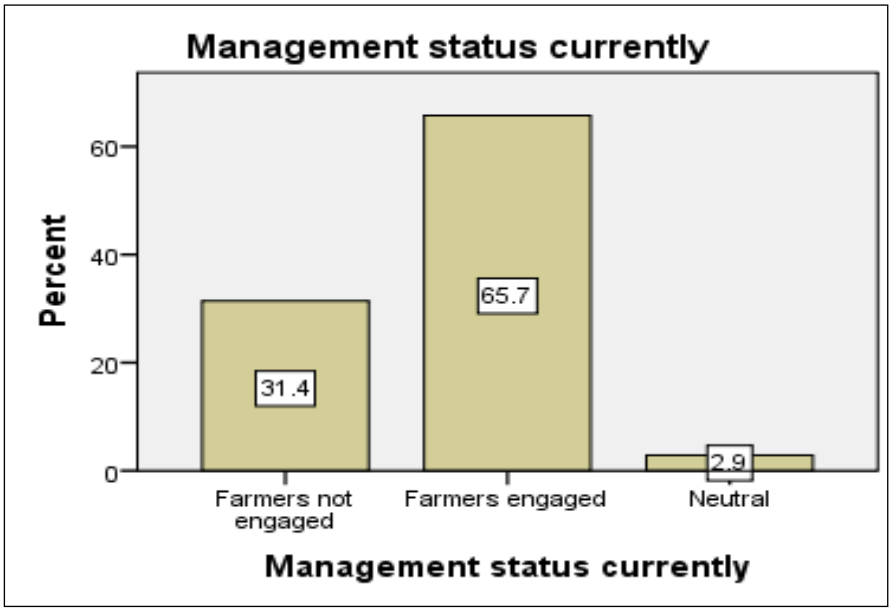

Figure 9 (b): Current Management Status

With the current setup, 65.7% report that farmers are now running the scheme by themselves and very few 31.4%, still say involvement is far from being available and 3% remained neutral.

5.2.2.2 Land Ownership

The reason for probing land ownership was to determine whether RESIS led to their ownership of land or otherwise. The research findings indicate the following:

Table 1(a): Previous Land Ownership

	Frequency	Percent	Cumulative Percent
Farmers not owned	10	28.6	28.6
Farmers owned	25	71.4	100.0
Total	35	100.0	

Table 1 (b): Current Land Ownership

	Frequency	Percent	Cumulative Percent
Farmers not owned	12	34.3	34.3
Farmers owned	17	48.6	82.9
Neutral	6	17.1	100.0
Total	35	100.0	

The research findings show that the majority of the farmers perceive land ownership to have decreased after the introduction of RESIS. About 71% say prior to RESIS they owned land, but with the current situation the number decreased to 48.6%. The issue of land ownership seems to be

confusing to farmers because that area is where farmers are given permission to occupy land, but not to own it.

5.2.2.3 Financial Assistance

The factor was probed to determine the financial assistance provided by the government or the private sector to farmers for cultivation. The findings below indicate that 91% of the farmers maintain that previously they were never assisted financial, but with the current situation the government, through Limpopo Department of Agriculture, assists in the form of improving the infrastructure of the irrigation system as well as training.

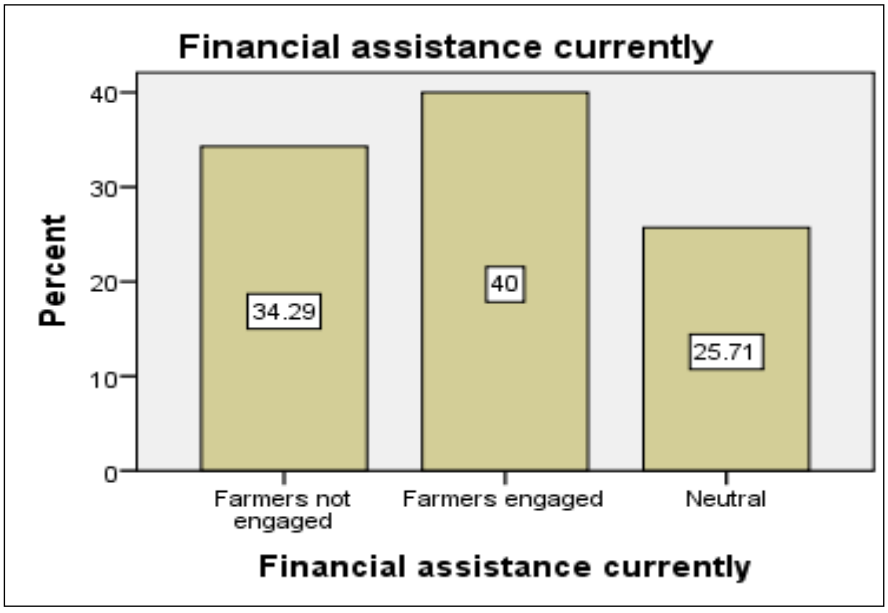

Figure 10: Current Financial Assistance

5.2.2.4 Technical Support Services

The reason for probing the technical support services was to determine the level of technical support provided by the technical staff from the Limpopo Department of Agriculture. The research finding indicates the following:

Table 2 (a): Previous technical support services

	Frequency	Percent	Cumulative Percent
Farmers not supported	16	45.7	45.7
Farmers supported	19	54.3	100.0
Total	35	100.0	

Table 2 (b): Current technical support services

	Frequency	Percent	Cumulative Percent
Farmers not supported	4	11.4	11.4
Farmers supported	31	88.6	100.0
Total	35	100.0	

According to the research findings, farmers were provided with technical support from technical staff both prior to and after the introduction of RESIS. However, the support increased from 54% to 88% after the introduction of RESIS, which is a sign of substantial improvement.

5.2.2.5 Levels of Training

Training is one of the key focuses of RESIS to ensure that all farmers within the irrigation scheme are trained in leadership management, financial management, farming skills etc. the reason for probing training was to determine the levels of training conducted prior to and after RESIS intervention. The research finding indicated the following:

Table 3 (a): Previous training levels

	Frequency	Percent	Cumulative Percent
Farmers not trained	17	48.6	48.6
Farmers trained	12	34.3	82.9
Neutral	6	17.1	100.0
Total	35	100.0	

Table 3 (b): Current training levels

	Frequency	Percent	Cumulative Percent
Farmers not trained	9	25.7	25.7
Farmers trained	22	62.9	88.6
Neutral	4	11.4	100.0
Total	35	100.0	

According to the findings a large proportion of farmers (63%) say that RESIS has given them the opportunity to get training in a number of subjects, and because of that they feel capacitated and skilled in farming and that they now can manage the scheme in general, finances, and assets and also operate the system on their own without assistance.

5.2.2.6 Levels of Production

The aim of introducing RESIS was to increase crop production which eventually would result in profit making. The reason for probing production levels was mainly to determine whether indeed farmers produced more than what they did prior to the rehabilitation of the scheme. The findings indicate as follows:

Table 4 (a): Previous production levels

	Frequency	Percent	Cumulative Percent
Farmers not produced	18	51.4	51.4
Farmers produced	16	45.7	97.1
Neutral	1	2.9	100.0
Total	35	100.0	

Table 4 (b): Current production levels

	Frequency	Percent	Cumulative Percent
Farmers not produced	18	51.4	51.4
Farmers produced	17	48.6	100.0
Total	35	100.0	

The results indicate that production levels were lower previously as well as currently. Fifty-one percent of farmers indicate that previously as well as currently no profit was made. An average of 47% of farmers is saying that production levels increased. However, the levels of production were the same prior to and after. In other words both groups of farmers are saying that there were no significant changes brought about by the introduction of RESIS regarding production. Farmers further indicated that their Strategic Partners were not transparent in that they used their equipment to the scheme and during harvesting time they said that no profit was recorded as the production only covered the expenses. This resulted in the majority of farmers losing interest in irrigation scheme farming; hence there was no farming during the time of research.

5.2.3 Findings from Technical Staff of Limpopo Department of Agriculture

The structural interview with the technical staff from the Limpopo Department of Agriculture was conducted and the following findings were indicated:

***Management Status* -** The farmers are now involved in managing the irrigation scheme, with the exception of incomes and expenditure control. A strategic partner manages the income and expenditure alone and without the involvement of the farmers.

***Land Ownership* -** According to the technical staff, farmers are not allowed to own land, but are only allowed to occupy it as long as they use it for farming. If one is no longer farming on that land, the Chief can re-allocate such land to someone else. Farmers are given permission to occupy such land by the office of Traditional Authority.

***Financial Assistance* -** No individual farmer was assisted financially to run their farming except that the irrigation scheme was revitalized by the Limpopo Department of Agriculture. Farmers were also trained by the department.

***Technical Support Services* -** More technical support was provided to the irrigation scheme. Two technical personnel were allocated full-time to the scheme to provide technical support required.

***Levels of Training* -** One of the objectives of RESIS was to provide training to farmers. The technical staff confirmed the training programme and modules which were developed and offered to farmers. They included the following:

- Understanding the project
- The roles and functions of the management committees
- Project cycle management
- Identification of project management gaps/problems

- The project planning matrix
- Management and leadership skills
- Basic bookkeeping
- Conflict resolution
- Joint Venture & Partnership
- Day/Operation management

Levels of Production **-** The interview indicated that the amount of harvested crops indicated some improvement when compared to the previous situations but were only surprised to hear the strategic partner pointing out that they worked at a loss. In other words, what has been produced did not cover the incurred expenditure. Farmers became suspicious as they were not involved in managing the expenditure.

5.3 Conclusion

The chapter was about the analysis of the findings of the research and the interpretation of the collected data from the 35 farmers involved in the study and two technical staff who provided technical support to the farmers in the irrigation scheme. The purpose of the study was to evaluate the impact of the revitalization of the Krokodilheuwel Smallholder Irrigation Scheme.

The next chapter presents the summary, conclusions and recommendations of the study.

CHAPTER SIX: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The research findings from the previous chapter will lead us to conclusions and recommendations with regard to the evaluation of the revitalization of smallholder Krokodilheuwel Irrigation Scheme.

6.2 Research summary

The study was meant to evaluate the impact of the revitalization of the smallholder irrigation scheme. It was undertaken at the Krokodilheuwel Irrigation Scheme. The introduction explained the study by outlining the research problem, aims and objectives, research questions, and the significance of the study. The literature review provided the history of South Africa on revitalization of smallholder irrigation schemes, which included the peasant and mission diversion scheme era, the smallholder canal era, the independent homeland era, the Irrigation Management Transfer and Revitalization era and the introduction of RESIS in the Limpopo Province. The Krokodilheuwel Irrigation Scheme, which was identified as the case study project was also described on the basis of its location and status in infrastructure prior to and after the introduction of RESIS. The research methodology, which included the nature of research design, described the area under study; the population of the study; sample selection method and size; data collection methods and analysis. On evaluating the impact of RESIS within the Krokodilheuwel Scheme, data collected through questionnaires from respondents were sorted, analyzed and interpreted in the form of figures and tables. The research was concluded with recommendations from both the respondents and the researcher.

6.3 Conclusion

According to the literature, smallholder irrigation schemes started far back in the 1980s with river diversion as the technology used in canal irrigation schemes, which were mainly for African families. Irrigation projects obtained their water from rivers into concrete storage dams and directed by concrete water weir diversion and concrete canal conveyance system. The irrigation schemes were identified as very important during the time of independent homelands for the purposes of boosting their economy (Beinart, 2001). Large irrigation schemes which were developed during that time were socially and commercially complex and costly to maintain, hence the inevitable collapse of the schemes.

The revitalization programme (RESIS) was then introduced in Limpopo Province by the provincial government as an intervention. It was started as a rehabilitation which only concentrated on engineering centred re-construction of dilapidated infrastructure to secure water supply. Upon realizing that rehabilitation was not achieving the ultimate goal, revitalization was introduced, which covered a wider range of activities including: enterprise planning, human capital development, empowerment and access to information, and repair and redesign of infrastructure.

With regard to the case study project, all RESIS interventions were developed properly, and according to the feelings held by the farmers the strategic partner could not be trusted to manage income and expenditure alone. To avoid such a thing The Limpopo Department of Agriculture should introduce monitoring and evaluation to the scheme.

6.4 Recommendations

The research findings indicated that RESIS brought about improvements in many areas with the exception of production levels. Farmers were not convinced that they did not make any profit and related that to the strategic partner whom they regarded as not transparent and honest. The farmers were

not involved in managing expenditure and income. In other words, the expenditure and income were only known to the strategic partner.

Farmers therefore recommend that the Limpopo Department of Agriculture should also be represented in the management of the scheme to ensure that farmers are actively involved in managing expenditure and income which will also serve as feedback to the department.

It is recommended that the Limpopo Department of Agriculture, as the funder of the revitalization programme, should develop monitoring and evaluation systems and apply them to all revitalized projects, including Krokodilheuwel Irrigation Scheme. The purpose should be to determine whether the revitalization programme is practised the way it was planned and the intended goals are achieved as envisaged. The aim should be to correct deviations. Once this happens the programme will achieve its intended goals, and the farmers will be empowered, thus leading to economic development.

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APPENDIX A: INTERVIEW QUESTIONAIRE FOR FARMERS

QUESTIONNAIRE FOR THE RESIS PROGRAMME

Name of the project: _____

SECTION A: SOCIO-DEMOGRAPHIC VARIABLES

Please respond by ticking in the appropriate box.

1. **Your age?**

21 – 30	1
31 – 40	2
41 – 50	3
51 – 60	4
61 – 70	5
71 – 80	6
81+	7

2. **Your gender?**

Male	1
Female	2

3. **Your highest level of education?**

Pre-Matriculation	0
Matriculation	1
College Qualification	2
Undergraduate	3
Graduate	4
Post -graduate	5

4. **Your previous employment status?**

Unemployed	0
Self-employed	1
Employed (full-time)	2
Employed (part-time)	3
Pensioner/Retired	4

5. Your monthly income at previous employment?

No income	0
Less than R500	1
R501 - R999	2
R1 000 - R1 999	3
R2000 - R4 999	4
More than R5 000	5

6. Your monthly grants?

No grants	0
Child grant	1
Old-age grant	2
Disability grant	3
Other-specify	4

7. How long have you been farming in this project?

0 – 1 Years	1
1 – 2 Years	2
2 – 3 Years	3
3+	4

8. Why did you choose farming?

Commercial	1
Subsistence	2

9. What crops do you farm?

Maize	1
Vegetables	2
Fruits	3
Others – specify	4

SECTION B: COMPARISON OF THE PREVIOUS AND CURRENT STATUS OF THE IRRIGATION SCHEME (BEFORE AND AFTER THE INTRODUCTION OF RESIS)

10. MANAGEMENT STATUS

Please use the following key to respond by ticking in the appropriate box:

SD = Strongly Disagree;
D = Disagree
A = Agree
SA = Strongly Agree
NA = Not Applicable

12.1 Previous Situation					
	SD	***D***	***A***	***SA***	***NA***
a) I was involved in the formation of the management committee	1	2	3	4	5
b) I felt represented in the previous committee	1	2	3	4	5
c) Management was much better before	1	2	3	4	5
d) I trusted the previous management committee	1	2	3	4	5
e) I always participated in management meetings	1	2	3	4	5

12.2 Current Situation					
	SD	***D***	***A***	***SA***	***NA***
a) I was involved in the formation of the management committee	1	2	3	4	5
b) I feel represented in the current management committee	1	2	3	4	5
c) Management is much better now	1	2	3	4	5
d) I trust the current management committee	1	2	3	4	5
e) I am always involved in management meetings	1	2	3	4	5

11. LAND OWNERSHIP

13.1 Previous Situation					
	SD	***D***	***A***	***SA***	***NA***
a) I was provided with enough land for farming	1	2	3	4	5
b) I owned that land	1	2	3	4	5
c) The Tribal Authority did provide more land for farming	1	2	3	4	5
d) I could keep my land even if I was no longer interested in farming	1	2	3	4	5

13.2 Current Situation					
	SD	***D***	***A***	***SA***	***NA***
a) I am currently provided with enough land for farming	1	2	3	4	5
b) I am owning that land	1	2	3	4	5
c) The Tribal Authority provided more land for farming	1	2	3	4	5
d) I can keep my land even if I am no longer interested in farming	1	2	3	4	5

12. FINANCIAL ASSISTANCE

14.1 Previous Situation					
	SD	***D***	***A***	***SA***	***NA***
a) Government gave me a grant to start farming	1	2	3	4	5
b) I received a loan from the land bank to start farming	1	2	3	4	5
c) I used my own money to run my farm	1	2	3	4	5
d) My farming was self-sustainable	1	2	3	4	5
e) My level of income increased through sales of farm produce	1	2	3	4	5

14.2 Current Situation					
	SD	***D***	***A***	***SA***	***NA***
a) Government is providing us with money to continue farming	1	2	3	4	5
b) I received a loan from the land bank to start farming	1	2	3	4	5
c) I have enough money to run my farm	1	2	3	4	5
d) My farming is self-sustainable	1	2	3	4	5
e) My level of income is always increasing through sales of farm produce	1	2	3	4	5

13. TECHNICAL SUPPORT SERVICES

15.1 Previous Situation					
	SD	***D***	***A***	***SA***	***NA***
a) My farm was irrigated	1	2	3	4	5
b) The irrigation system provided for my expansion	1	2	3	4	5
c) There was enough water from the dam	1	2	3	4	5
d) Boreholes were also available and on standby to supply water	1	2	3	4	5
e) I paid less for using more water	1	2	3	4	5
f) The irrigation system was properly maintained	1	2	3	4	5
g) Roads to access market were properly maintained	1	2	3	4	5
h) Electricity was supplied and properly maintained	1	2	3	4	5

15.2 Current Situation					
	SD	***D***	***A***	***SA***	***NA***
a) My farm has been irrigated	1	2	3	4	5
b) The irrigation system provides for my expansion	1	2	3	4	5
c) There is always enough water from the dam	1	2	3	4	5
d) Boreholes are also available and on standby to supply water	1	2	3	4	5
e) I pay less for using more water	1	2	3	4	5
f) The irrigation system is properly maintained	1	2	3	4	5
g) Roads to access markets are properly maintained	1	2	3	4	5
h) Electricity supply has been upgraded and properly maintained	1	2	3	4	5

14. PRODUCTION LEVELS

16.1 Previous Situation					
	SD	***D***	***A***	***SA***	***NA***
a) I harvested during summer and winter	1	2	3	4	5
b) I employed more people to assist during harvesting	1	2	3	4	5
c) I had a reliable market to supply	1	2	3	4	5
d) I supplied products to the market satisfactorily	1	2	3	4	5
e) The number of people demanding my products were increasing	1	2	3	4	5
f) I switched to harvesting by machine	1	2	3	4	5

16.2 Current Situation					
	SD	***D***	***A***	***SA***	***NA***
a) I am now harvesting both during summer and winter	1	2	3	4	5
b) I employ more people to assist during harvesting	1	2	3	4	5
c) I am always having a reliable market to supply my products	1	2	3	4	5
d) I do supply the markets to their satisfactorily	1	2	3	4	5
e) The number of people demanding my products is ever increasing	1	2	3	4	5
f) In the near future I will use a harvesting machine	1	2	3	4	5

15. TRAINING LEVELS

Please use the following key to respond by ticking in the appropriate box:
NK = No Knowledge
SK = Some Knowledge
AK = Average Knowledge
GK = Good Knowledge

17.1 Previous Situation				
	NK	***SK***	***AK***	***GK***
a) I knew which crops to plant and during which seasons	1	2	3	4
b) I could manage finances properly	1	2	3	4
c) I knew how to manage and motivate people working for me	1	2	3	4
d) I could utilize and manage the scarce water supplied	1	2	3	4
e) I could manage my assets in a proper manner	1	2	3	4
f) I could operate the then irrigation system	1	2	3	4

17.2 Current Situation				
	NK	***SK***	***AK***	***GK***
a) I know which crops to plant and during which seasons	1	2	3	4
b) I can now manage finances properly	1	2	3	4
c) I can now manage people and motivate them accordingly	1	2	3	4
d) We can now manage and utilize water in a proper manner	1	2	3	4
e) I can manage my assets properly	1	2	3	4
f) I can always operate the irrigation system without any help	1	2	3	4

APPENDIX B: STRUCTURED INTERVIEW QUESTIONNAIRE FOR THE TECHNICAL STAFF FROM LDA

1. Please give comparison of the situation in the irrigation scheme prior to and after the introduction of RESIS with regard to the following:

1.1 Management status

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1.2 Land ownership

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1.3 Financial assistance

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1.4 Technical support services

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1.5 Training levels

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1.6 Production levels

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