

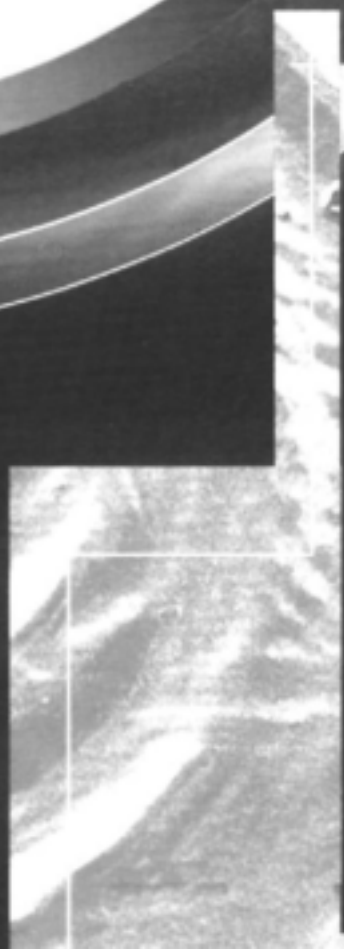
**INVESTIGATION OF DIFFERENT FARM TENURE  
SYSTEMS AND SUPPORT STRUCTURE FOR  
ESTABLISHING SMALL-SCALE IRRIGATION  
FARMERS IN LONG TERM VIABLE CONDITIONS**

**T Tlou • D Mosaka • S Perret •  
D Mullins • CJ Williams**

**WRC Report No. 1353/1/06**



**Water Research Commission**



**INVESTIGATION OF DIFFERENT FARM TENURE SYSTEMS  
AND SUPPORT STRUCTURES FOR ESTABLISHING  
SMALL-SCALE IRRIGATION FARMERS IN  
LONG TERM VIABLE CONDITIONS**

Report to the  
Water Research Commission

by

T Tlou: Tlou & Mallory Engineering and Management Services  
(Pty) Ltd  
D Mosaka: Mosaka Associates  
S Perret: University of Pretoria and CIRAD  
D Mullins: Conningarth Economists  
CJ Williams: Economic Project Evaluation (Pty) Ltd

MARCH 2006

WRC Report No : 1353/1/06

ISBN No 1-77005-475-8

#### **DISCLAIMER**

This report has been reviewed by the Water Research Commission (WRC) and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the WRC, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS</b> .....	<b>ix</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>x</b>
<b>LIST OF ACRONYMS</b> .....	<b>xv</b>
<b>1 INTRODUCTION</b> .....	<b>1</b>
1.1 BACKGROUND .....	1
1.2 RESEARCH OBJECTIVES .....	3
1.3 RESEARCH HYPOTHESIS .....	4
1.4 STRUCTURE OF THE REPORT .....	4
<b>2 CONTEXT OF THE RESEARCH: SMALL-SCALE IRRIGATION SCHEMES IN SOUTH AFRICA</b> .....	<b>6</b>
2.1 INTRODUCTION .....	6
2.2 THE ESTABLISHMENT OF SMALL-SCALE IRRIGATION SCHEMES .....	7
2.2.1 History .....	7
2.2.2 The Current Situation and Recent Developments .....	8
2.3 NATIONAL WATER ACT .....	11
2.4 IRRIGATION AGRICULTURE IN THE CONTEXT OF SMALL- SCALE IRRIGATION SCHEMES .....	12
<b>3 APPROACH AND METHODS</b> .....	<b>14</b>
3.1 THE APPROACH .....	14
3.2 THE METHODS .....	15
3.2.1 Literature .....	15
3.2.2 Case Studies .....	16
3.2.3 Data Collection .....	18
3.3 SYNTHESIS OF FINDINGS .....	20
3.3.1 Summarising Impacts .....	20
3.4 CONCLUSION .....	22
<b>4 LAND TENURE IN SMALL-SCALE IRRIGATION SYSTEMS</b> .....	<b>23</b>
4.1 INTRODUCTION .....	23
4.2 DEFINITION OF LAND TENURE SYSTEMS .....	24
4.2.1 Freehold Tenure .....	25

## TABLE OF CONTENTS

4.2.2	Quitrent Tenure .....	26
4.2.3	Communal Tenure .....	26
4.2.4	Trust Tenure .....	26
4.2.5	Discussion .....	27
4.3	<b>HISTORY OF LAND TENURE SYSTEMS IN SMALL-SCALE IRRIGATION .....</b>	<b>27</b>
4.4	<b>CURRENT SITUATION AND POLICIES IN TENURE SYSTEMS.....</b>	<b>29</b>
4.4.1	Restitution.....	30
4.4.2	Redistribution.....	31
4.5	<b>TENURE REFORM .....</b>	<b>31</b>
4.5.1	White Paper Policy Guiding Principles .....	31
4.5.2	Institutional Framework.....	33
4.5.3	Successful Land and Tenure Reform Defined.....	35
4.5.4	Analysis of Applicable Acts .....	37
4.5.5	Situation on the Case Study Sites.....	42
4.6	<b>CONCLUSION .....</b>	<b>43</b>
<b>5</b>	<b>DESCRIPTION OF SELECTED CASE STUDY SCHEMES .....</b>	<b>46</b>
5.1	<b>SELECTION OF CASE STUDY SCHEMES .....</b>	<b>46</b>
5.1.1	Field Visits .....	46
5.1.2	Findings from Field Visits.....	47
5.1.3	Final Selection of Case Study Schemes.....	51
5.2	<b>ZANYOKWE IRRIGATION SCHEME .....</b>	<b>52</b>
5.2.1	General.....	52
5.2.2	History .....	54
5.2.3	Physical Environment of the Scheme.....	58
5.2.4	Infrastructural Factors.....	60
5.2.5	Agribusiness Environment: Credit, Inputs AND Produce Markets....	61
5.2.6	Demography and Social Capital.....	61
5.3	<b>MNGAZI IRRIGATION SCHEME .....</b>	<b>62</b>
5.3.1	General: History of the Scheme .....	62
5.3.2	Evolution: Farming, Infrastructures, Environment, Support, Markets .....	65
5.3.3	Current Infrastructures .....	65
5.3.4	Soil and climate.....	66
5.3.5	Markets and Agribusiness Environment.....	66
5.3.6	Organisations.....	68
5.3.7	Applying the Sustainable Livelihoods Framework .....	69
5.4	<b>CONCLUSION .....</b>	<b>71</b>
<b>6</b>	<b>PRODUCTION, MARKETING AND IRRIGATION .....</b>	<b>72</b>
6.1	<b>PRODUCTION .....</b>	<b>72</b>
6.1.1	Farmer Typologies.....	74

## TABLE OF CONTENTS

6.1.2	Crops and Crop Budgets.....	77
6.1.3	Zanyokwe Production Comparison.....	79
6.1.4	Production and Tenure.....	80
6.2	<b>MARKETING</b> .....	80
6.2.1	Marketing Infrastructure .....	81
6.2.2	Market Access .....	81
6.2.3	Marketing Services .....	82
6.2.4	Price Comparison .....	83
6.2.5	Marketing and Tenure .....	84
6.3	<b>IRRIGATION SYSTEMS</b> .....	84
6.3.1	An Overview of Irrigation in SISs.....	85
6.3.2	Irrigation Systems in Place in the Study Area.....	87
6.3.3	Most Appropriate Technology .....	90
6.3.4	Irrigation and Tenure.....	91
6.4	<b>CONCLUSIONS</b> .....	91
<b>7</b>	<b>FINANCING</b> .....	<b>95</b>
7.1	A HISTORICAL PERSPECTIVE.....	95
7.2	CURRENT APPROACHES TO PROVISION OF FINANCE.....	97
7.2.1	Land Bank.....	97
7.2.2	Uvimba .....	98
7.2.3	Private Sector .....	100
7.2.4	Summary of the Current Situation .....	101
7.3	FINANCING SYSTEMS IN PLACE, AND FARMERS' PERCEPTIONS .....	101
7.3.1	Zanyokwe .....	102
7.3.2	Mngazi .....	104
7.4	<b>DISCUSSION</b> .....	105
7.4.1	Land Tenure .....	105
7.4.2	Finance.....	106
7.4.3	Training.....	107
7.4.4	Institutional.....	107
7.5	<b>CONCLUSIONS</b> .....	108
<b>8</b>	<b>INSTITUTIONAL, ORGANISATIONAL AND MANAGEMENT ARRANGEMENTS</b> .....	<b>112</b>
8.1	INTRODUCTION .....	112
8.2	KEY OBJECTIVES.....	112
8.3	INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS .....	112
8.3.1	Land Tenure .....	113
8.3.2	Water Management .....	115
8.3.3	Summary of Institutional and Organisational Arrangements Affecting SIS.....	118
8.4	<b>MANAGEMENT ARRANGEMENTS</b> .....	120

## TABLE OF CONTENTS

8.4.1	Historical Perspective.....	121
8.4.2	Current Perspective .....	121
8.4.3	"Off-Farm" Management Implications for SISs .....	121
8.4.4	"On-Farm" Management Implications for SIS .....	123
8.4.5	A Comparison of Community and Individual Management Systems .....	123
8.5	CASE STUDY EXPERIENCES .....	125
8.5.1	Institutional and Organisational Arrangements.....	125
8.5.2	Management Arrangements.....	126
8.6	CONCLUSIONS AND RECOMMENDATIONS .....	127
8.6.1	Conclusions .....	128
8.6.2	Recommendations .....	129
8.6.3	Conclusion .....	132
<b>9</b>	<b>INFLUENCE OF SOCIAL FACTORS.....</b>	<b>134</b>
9.1	BACKGROUND .....	134
9.2	THEORETICAL PERSPECTIVE.....	134
9.2.1	Socio-psychological Factors.....	135
9.2.2	Socio-economic Factors.....	138
9.2.3	Social and physical Factors.....	139
9.3	FINDINGS OF THE CASE STUDIES .....	141
9.3.1	Socio-psychological Factors.....	142
9.3.2	Socio-economic Factors.....	144
9.3.3	Social and Physical Factors .....	149
9.4	THE INFLUENCE OF LAND TENURE ON SOCIAL FACTORS .....	151
9.4.1	Land tenure and Socio-psychological Factors .....	151
9.4.2	Land tenure and Socio-economic Factors .....	154
9.4.3	Land tenure and Socio-physical Factors .....	156
9.5	SUMMARY AND CONCLUSION .....	156
<b>10</b>	<b>SYNTHESIS OF FINDINGS.....</b>	<b>159</b>
10.1	A BRIEF RECAPITULATION .....	159
10.2	SOCIAL AND ECONOMIC FINDINGS.....	160
10.2.1	Land Tenure .....	160
10.2.2	Production, Marketing and Irrigation.....	160
10.2.3	Financing .....	161
10.2.4	Institutional, Organisational and Management.....	162
10.2.5	Social Factors .....	162
10.2.6	Summary of Impacts .....	163
10.3	CONCLUSIONS.....	165
<b>11</b>	<b>CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>166</b>
11.1	INTRODUCTION .....	166
11.1.1	Analysing the Dynamics of Change.....	166

*TABLE OF CONTENTS*

11.2	CONCLUSIONS.....	170
11.3	RECOMMENDATIONS.....	171
	LITERATURE CITED.....	172
	APPENDIX A: LITERATURE SURVEY.....	A1
	APPENDIX B: SUSTAINABLE LIVELIHOOD FRAMEWORK.....	B1
	APPENDIX C: SMILE.....	C1
	APPENDIX D: SUSTAINABLE LIVELIHOOD RESPONSES.....	D1
	APPENDIX E: USE OF THE ANALYTICAL FRAMEWORK.....	E1
	APPENDIX F: HOUSEHOLD SURVEY QUESTIONNAIRE.....	F1

## LIST OF TABLES

Table 4.1:	Categories of Land Tenure Systems.....	25
Table 5.1:	Synoptic information on the irrigation schemes visited in Ciskei .....	48
Table 5.2:	Synoptic information on the irrigation schemes visited in Transkei .....	49
Table 5.3:	Rainfall recorded at Fort Cox (1930-1980) and estimated Class A pan evaporation data applying to Zanyokwe Irrigation Scheme (from The Ciskei Department of Agriculture and Forestry, 1981).....	59
Table 5.4:	Population Estimates of the Zanyokwe Irrigation Scheme .....	62
Table 6.1:	Traits and Performance of Farming Systems in the Zanyokwe Scheme .....	76
Table 6.2:	Crops and Crop Budgets.....	78
Table 6.3:	Production Comparisons between Zanyokwe and other sites in the Eastern Cape .....	79
Table 6.4:	Price Comparison between prices realised by producers at Zanyokwe and the National Fresh Produce Markets .....	83
Table 6.5:	Incidence Of Use Of Different Types Of Irrigation Systems .....	87
Table 6.6:	Irrigation Systems Used In Short-Listed Case Study Schemes.....	88
Table 8.1:	Summary of Institutional and Organisational Arrangements ...	119
Table 8.2:	Relative Strengths and Weaknesses of Community versus Individual Management Systems .....	124
Table 9.1:	Opinion of respondents on payments for water supply and related service.....	143
Table 9.2:	Respondents' willingness to pay for water supply .....	143
Table 9.3:	Summary of Descriptive Information on Zanyokwe Irrigation Scheme.....	145
Table 9.4:	Socio-economic Features as per Occupational Status .....	146

*LIST OF TABLES*

Table 9.5:	Socio-economic Features as per Education Status .....	147
Table 9.6:	Socio-economic Features as per Gender.....	148
Table 9.7:	HIV/AIDS Prevalence Rates (%), 1998 and 2000 .....	149
Table 9.8:	Problems faced by Zanyokwe Farmers.....	150

## LIST OF FIGURES

Figure 1.1:	Matrix of System-on-System Impacts .....	4
Figure 3.1:	Basic Framework .....	15
Figure 3.2:	Matrix of System-on-System Impacts .....	21
Figure 4.1:	Land Tenure Matrix .....	45
Figure 5.1:	Zanyokwe Irrigation Scheme.....	53
Figure 5.2:	Mngazi Irrigation Scheme .....	63
Figure 6.1:	Production, Marketing and Irrigation matrix.....	93
Figure 7.1:	Sources of Finance for SIS .....	102
Figure 7.2:	Financing Matrix.....	110
Figure 8.1:	Institutional, Organisational And Management Matrix .....	133
Figure 9.1:	Social Matrix .....	158
Figure 10.1:	Summary Matrix of System-on-System Impacts .....	164

## **ACKNOWLEDGEMENTS**

A number of people made important contributions to this study by sharing their experience, knowledge, advice and encouragement with the author. It is therefore appropriate to thank the following persons who contributed directly or indirectly to the completion of this study.

### **The Steering Committee:**

Dr GR Backeberg	Water Research Commission (Chairman)
Prof GCG Fraser	University of Fort Hare
Prof W van Averbeke	Tshwane University of Technology
Prof HD van Schalkwyk	University of the Free State
Dr G Kundhlande	University of the Free State
Mr FPJ van der Merwe	Department of Water Affairs and Forestry
Mr JF Joubert	Department of Agriculture, Eastern Cape

### **The Project team**

Mr T Tlou	Tlou & Mallory
Mr DD Mosaka	Mosaka Associates
Dr D Mullins	Conningarth Economists
Mr CJ Williams	Economic Project Evaluation
Prof S Perret	University of Pretoria and CIRAD
Mr N Ntonto	University of Pretoria (Masters student)
Mr S Yokwe	University of Pretoria (Masters student)

The financing of this project by the Water Research Commission and the contributions of the members of the Steering Committee is gratefully acknowledged.

This project was only possible with the co-operation of many individuals and institutions. In particular, the work performed by Mr William Mullins is acknowledged; this study could not have been accomplished without his practical knowledge of agriculture, his constructive comments, diligence and enthusiasm with respect to the data collection in the field, and his contribution to the Chapter on Land Tenure.

## **EXECUTIVE SUMMARY**

This study was commissioned by the Water Research Commission (WRC) to review the land tenure systems and support structures in South Africa, to identify constraints and opportunities relating to land tenure and support structures, with a view to developing a framework for sustainable settling of small-scale irrigation schemes. The last decade has witnessed significant land and water reforms in South Africa including land tenure and local governance on water to ensure sustainable development and management of the resources fundamental to creating an enabling environment for rural communities to lift themselves out of poverty. However the growing recognition of the importance of land tenure to sustainable development has not been supported by an investigation into how it influences smallholder irrigation in improved food production efficiency.

This research has tried to provide essential information based on both literature review and case studies of existing successful and unsuccessful small-scale irrigation systems on identifying the attributes and their linkages enabling successful settlement of small-scale irrigation schemes.

The study methodology included the collection and analysis of existing international and local literature on land tenure, security of tenure and support systems. This was supported by case studies of existing small-scale irrigation schemes with specific focus on the Eastern Cape Province. Two schemes were selected for detailed study and interviews were conducted with selected key informants and farmers including relevant government departments in the province, and civil society groups.

### **FINDINGS**

The study has revealed that many of the problems of settling small-scale irrigation farmers in long term viable conditions can be attributed to the history of the country, and the objectives and present performances of small-scale irrigation systems. From the outset and throughout these times, small-scale irrigation within the then Bantustans was only directed towards local food supply (although there was some scheme development during the 1950s that was aimed at full livelihoods), with no market environment or support system in place to promote any form of

commercialisation whatsoever. In some cases, the quality of the land can generally be described as marginal and of low to medium potential.

Since 1994 and with the promulgation of the National Water Act (Act 36 of 1998) government has decentralized the management of water resources and is withdrawing its support of the irrigation schemes through the irrigation management transfer (IMT). These are to be transferred to water user associations. This has resulted in a large number of the small-scale irrigation schemes becoming defunct.

A review of the land tenure system in the case studies revealed that communally held land was problematic as far as small-scale irrigation schemes with low production levels were concerned. Tenure security is a major issue affecting settling of SISs in long term viable conditions. The state controls a lot of the land. Through the Communal Land Rights Act, the South African Government is seeking to clarify land rights by transferring title from the state to local communities and to establish administration structures to govern the process of issuing and registering land tenure rights to individuals in communal areas. This will improve access to financing because the land can be held as collateral.

There are many cross-linked impacts between the various systems. For example, finance can be said to have a significant impact on production (short-term production finance), and a moderate impact on irrigation systems (ability to upgrade and maintain). By the same token, other systems such as production, land tenure, social, institutions and organisations each have an impact on the ability to attract and service finance.

**MATRIX OF SYSTEM-ON-SYSTEM IMPACTS**

	land tenure	production	marketing	irrigation	financing	institutional	social	all	definitions
land tenure	0	2	1	1	3	1	3	11	freehold, quitrent, communal, trust, leased
production	0	0	2	1	1	0	1	5	quantity and quality of output, crop selection
marketing	0	1	0	0	1	1	0	3	effectiveness in reaching markets
irrigation	1	3	0	0	0	1	0	5	adequate water, appropriate irrigation systems
financing	1	3	1	2	0	0	0	7	access to, and effective management of, finance
institutional	2	0	1	0	2	0	2	7	WUAs, CMAs, CPAs, Acts, management
social	2	2	1	0	2	1	0	8	Community attitudes, skills bases, level of training
all	6	11	6	4	9	4	6	46	

NOTE: All impacts are row upon column

It is difficult (as well as being impractical) to try to pinpoint any one system as making a prime contribution to the success or failure of the schemes studied, but it would be useful to know what these aggregated impacts of one system upon another might be. With this in mind, the various impacts were graded in severity and entered into a matrix. A matrix of system on system impacts was developed and is shown in the figure above.

Such a matrix clearly shows that production is the most impacted upon system, hence the most sensitive one. Research conducted in the project highlights that low production and productivity are major issues in SIS.

By the same token, the system which has the greatest impact on all the other systems is land tenure. This finding provides a sound justification for the drive to reform institutions relating to land rights.

It was also demonstrated in one case study that a strong institutional and social cohesion with access to markets made the small-scale irrigation scheme viable and successful. Most of the institutional changes implemented by Government have resulted in making South African agricultural more competitive by increasing productivity. However it is questionable as to whether what is good for established commercial farmers is also necessarily good for small farmers from a disadvantaged background. It is evident that SIS farmers do not understand the concepts of economic efficiency and sustainability. Therefore governments must take the lead by creating an enabling policy environment and establishing the institutions to support and guide these farmers both initially, and as they develop towards commercialism.

The other issues researched were the financing, marketing and management support systems for SIS in order to ensure they become sustainable and the farmers themselves take ownership of these schemes. In terms of production it was clear that small-scale irrigation farmers need access to markets where they can sell sufficient quantities of produce at prices that will enable them to make a worthwhile return on their cash investments and farming efforts. This is reinforced by the general context of the study in that privatisation and local governance do require, *inter alia*, full cost recovery and maintenance. Further, resources will have to be paid for. This supposes some return in cash from irrigation, meaning that subsistence and self consumption are not anymore realistic options. Marketing and cash income are required from

the farmers. Without this, there is in effect no incentive for them to go beyond farming purely as a means of supplementing their daily food requirements.

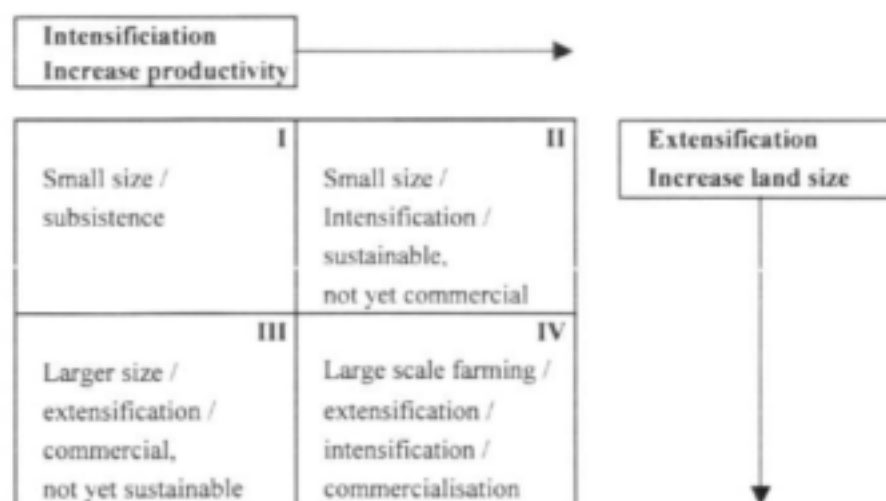
In terms of the long-term viability of the schemes researched, attention needs to be paid both to farmers' ability to access credit and their ability to service credit once obtained, and it must be ensured that adequate training is available.

Further findings are that appropriate irrigation systems based on the best principles of efficient irrigation, insofar as possible using indigenous skills and materials should be used in SISs. The sustainability of settling farmers on SISs depends on the capability of the farmers to organise themselves in an efficient and responsible group. Government has created the enabling environment for the establishment of water user associations (WUAs) but needs to continue providing support in the form of training and with the operational and managerial capabilities.

#### RECOMMENDATIONS

An analytical framework (figure below) was built to provide a basis for understanding the dynamics of the development of SISs, and it was demonstrated that this framework provided insight into the interaction of its various elements as we moved within it.

THE ANALYTICAL FRAMEWORK



The framework was then used to develop concrete recommendations surrounding the problems of growth and development of SISs. These recommendations related to problems of growth within existing SISs, as well to problems associated with the establishment of new SISs from scratch.

The premises underpinning this framework are that current SISs are by and large in Quadrant I (where plot sizes are small, and farming is at subsistence level), and that it is desired to develop them into Quadrant IV where activities are both commercial in size and sustainable in nature.

Each step in this journey was carefully considered, the impacts on land tenure systems as well as all other support systems (production, marketing, irrigation, financing, institutional and social) were evaluated and appropriate recommendations were made.

Two major recommendations were that development in existing schemes should take place along the path Quadrant I to Quadrant II to Quadrant IV, and that new schemes should be initiated in future in Quadrant III rather than Quadrant I as has tended to be the case up to the present.

### **LIST OF ACRONYMS**

BEE	Black Economic Empowerment
BLT	Beament Lesley Thomas Recruitment Agency
CAB	Ciskei Agricultural Bank
CLRA	Communal Land Rights Act (Act No.11 of 2004)
CMA	Catchment Management Agency
CPA	Communal Property Association
CPAA	The Communal Property Associations Act (Act No. 28 of 1996)
DBSA	Development Bank of Southern Africa
DFID	Department for International Development
DLA	Department of Land Affairs
DWAF	Department of Water Affairs and Forestry
EC-DOA	Eastern Cape Department of Agriculture
GDP	Gross Domestic Product
HIV/AIDS	Human Immunodeficiency Virus and Acquired Immunity Deficiency Syndrome
NCASA	National Cooperatives Association of South Africa
NGO	Non-Governmental Organisation
NWA	National Water Act, Act No. 36 of 1998 as amended
NWRS	National Water Resource Strategy
PRS	Poverty Reduction Strategy
PTO	Permission to occupy
PWD	Public Works Department
IRDP	Integrated Rural Development Programme
SADT	South African Development Trust
SETA	Sector Education and Training Authority
SIS	Small-scale Irrigation Scheme
SMILE	Sustainable Management of Irrigated Land and Environment
White Paper	White Paper on South African Land Policy, April 1997
USSR	Union of Soviet Socialist Republics
WMA	Water Management Area
WUA	Water User Association

PART ONE

## 1 INTRODUCTION

by *Toriso Tlou*<sup>1</sup>

### 1.1 BACKGROUND

South Africa accounts for approximately 40% of the African continent's industrial output, 25% of the continent's gross domestic product (GDP), about half of the electricity generated and 45% of mineral production in Africa. Although the country has a sophisticated free market economy, South Africa's economy shows a marked duality with a sophisticated industrial economy, which has developed alongside a underdeveloped informal economy. The country thus has two economies, the first world economy and the third world economy, which involves the majority of historically disadvantaged South Africans, and features limited resources to address the social and development needs. Agriculture, forestry and fishing now account for only 4% of the country's GDP (12% when accounting for food processing, agri-industry and agribusiness), although a century ago the country had almost exclusively an agrarian economy. Although the agricultural sector is a not a significant contributor to the GDP, the sector employs approximately 14% of the active population.

The official unemployment rate is 28.2% (SA, 2003/04) of the country's economically active population. However this figure jumps to 41.8% if one includes the population that has given up looking for employment. Given that 42% of the population is based on the rural economy and has its livelihood mainly linked to land therefore land is the most fundamental resource to the poor that can help lift them out of the current poverty they find themselves in. Yet, with a large majority of the rural black population being located onto less than 18% of land during the apartheid era, such resource could not (and still can not) insure proper contribution to livelihoods of the poorest and most disadvantaged households of the nation. Land is important because it forms the basis of agricultural production, which can contribute to the social and economic development of the rural population. Government has shown its commitment to developing the rural areas by establishing an Integrated

---

<sup>1</sup> Tlou & Mallory

Rural Development Programme (IRDP) in the Deputy President's Office, and by developing and implementing land reform programmes

There are two principal forms of land tenure systems found in South Africa namely; customary and statutory tenure. Customary land tenure system is governed by unwritten traditional rules and administered by traditional leaders. The access to land in customary tenure is contingent upon tribal or community membership controlled by the chief. Although land is not alienable from the community trust and cannot be used as collateral for loans, an individual's land use rights are secure, subject to certain conditions which include that the land must be continuously cultivated subject to period fallow. Land ownership under the statutory tenure system varies widely from freehold, through leasehold entitlements, to state land, and offers exclusive rights to the owner. This guarantees security of tenure.

Because of South Africa's history, land tenure systems were based on race. This has consequently resulted in imbalances in access to land. In the former homelands, initially comprising 13%, then about 17%, of the country's area land was under a customary tenure system whilst in the rest of the country a statutory land tenure system was practised. Inequitable distribution and uncertainty in land tenure (system and security) are leading problems of land policies that the South African Government is trying to address. As part of correcting these imbalances, a number of Acts dealing with land tenure, redistribution and restitution have been or are being promulgated to deal with the inequitable distribution and historical problems.

It is crucial to recognise that not only land but land tenure system<sup>2</sup> and rights and tenure security are central to sustainable agricultural production and therefore to establishing small scale farmers in long term viable conditions. Worldwide it is proven that irrigation farming can play a significant role in contributing to the social and economic upliftment of rural communities (Saleth (2002), and Saleth and Dinar (2004). The government initiative of IRDP therefore requires support through research on how farm tenure systems and support structures impact on establishing small-scale farmers to enable sustainable social and economic development of the rural areas.

---

<sup>2</sup> Land tenure is the system of rights and institutions that govern access to and use of land.

To achieve this goal a need exists for a well-researched strategic framework, which takes into account the multi-layered characteristics of the development process necessary to operate and manage small-scale irrigation<sup>3</sup> schemes on a sustainable economic and financial basis. The issue is to what extent current tenure systems provide certainty and security of rights and encourage sustainable irrigation agricultural production in small holder irrigation schemes. The constraints being encountered by the small-scale irrigation farmers need to be well understood so that a framework can be developed that addresses these constraints. This is the basis of the research study.

## 1.2 RESEARCH OBJECTIVES

The research aims as embodied in the research proposal are:

1. To develop tenure models that would ease the management and operation of smallholding irrigation schemes, and settle small-scale irrigation farmers in a sustainable manner under South African land tenure and rights conditions. Small-scale irrigation can be defined as irrigation, usually on small plots, in which small farmers have controlling influence, using a level of technology which can operate and maintain effectively.
2. To develop suitable irrigation systems for small-scale irrigation farmers.

These aims are realised operationally in the course of this research by:

1. Developing a framework that takes into account the interlinkages between tenure systems and support structures that would ensure establishment and management of small-scale irrigation schemes in a sustainable manner under South African land tenure and rights conditions; and
2. Determining an applicable on-farm support system, institutional setting and social framework to regulate the production, marketing, financial and water resource needs of small-scale irrigation farmers.

---

<sup>3</sup> Small-scale irrigation can be defined as irrigation undertaken by means of family-based farming systems, usually on small plots, in which farmers have controlling influence, using appropriate levels of technology for irrigation, yet with partial integration to incomplete markets (credit, labour, produce, information, inputs markets)

The project is two fold, including investigation and analysis at both macro level (through literature review and international experience review,) and at local level (through investigations and case study analysis in the Eastern Cape).

### 1.3 RESEARCH HYPOTHESIS

The hypothesis which underlies the aims and objectives of this research is:

**“Land tenure and support structures have an effect on the long-term viability of Small Irrigation Schemes.”**

In order to test the validity of this hypothesis, qualitative and quantitative data were collected on the impact of different farm tenure systems on the level of production, institutional arrangements, organisation and management structures and the financing of small scale irrigation schemes. The findings of this research were brought together in a matrix which quantified the linkages between land tenure and the structures mentioned above. This matrix takes the form illustrated in illustrated in **Figure 1.1** below.

**FIGURE 1.1: MATRIX OF SYSTEM-ON-SYSTEM IMPACTS**

	land tenure	production	marketing	irrigation	financing	institutional	social	all	definitions
land tenure	0	2	1	1	3	1	3	11	freehold, quitrent, communal, trust, leased
production	0	0	2	1	1	0	1	5	quantity and quality of output, crop selection
marketing	0	1	0	0	1	1	0	3	effectiveness in reaching markets
irrigation	1	3	0	0	0	1	0	5	adequate water, appropriate irrigation systems
financing	1	3	1	2	0	0	0	7	access to, and effective management of, finance
institutional	2	0	1	0	2	0	2	7	WUAs, CMAs, CPAs, Acts, management
social	2	2	1	0	2	1	0	8	Community attitudes, skills bases, level of training
all	6	11	6	4	9	4	6	46	

**NOTE:** All impacts are row upon column

### 1.4 STRUCTURE OF THE REPORT

This research report is divided into three parts. **Part I**, which outlines the background of, and approach to, the study has three chapters. **Chapter**

**1** provides the background to the study and its aims and objectives; **Chapter 2** places the study in the context of small-holder irrigation schemes (SISs) in South Africa; and **Chapter 3** describes the approach and methods used in the research; describes the history of land tenure systems and the development of small-scale irrigation schemes in the country.

**Part II** is the result portion of the report and exposes on the findings of the research. It focuses on the findings of the interlinkages between land tenure and the factors that support effective and efficient production on small-scale irrigation systems. **Chapter 4** describes the different land tenure systems available in South Africa; **Chapter 5** provides a description of case study schemes selected for research in this project; and **Chapters 6 to 9** describe the impact of different land tenure systems and tenure security on the following factors:

- Production, marketing and irrigation systems
- Financing of small-scale irrigation systems
- Institutional arrangements, organisations and management of small-scale irrigation schemes
- Social and value systems of farmers on small-scale irrigation schemes (SIS)

**Part III** of this research report describes the conclusions of the research, and makes recommendations for further research.

**Chapter 10** concludes the research by discussing:

- whether the research hypothesis has been validated;
- whether the research objects were met;
- the extent to which the research questions have been answered;

and **Chapter 11** makes recommendations for further research.



## 2 CONTEXT OF THE RESEARCH: SMALL-SCALE IRRIGATION SCHEMES IN SOUTH AFRICA

by *Toriso Tlou*<sup>4</sup>

### 2.1 INTRODUCTION

This chapter highlights issues that have been addressed within the project, or that help understand the situation of SIS in South Africa, namely:

- an overall record of poor productivity, high operation costs, and of subsistence orientation,
- a difficult current situation, with most schemes being non operating, or just collapsed,
- a history of external control, management, and decisions,
- uncertainties regarding property rights over land and water,
- lack of clarity regarding the actual role of SIS in a context of poverty alleviation, rural development, economic efficiency, State withdrawal and liberal stance,
- a promising new water legislation, yet with an overall context of decentralization, privatisation, and cost recovery,
- ambitious programmes towards rehabilitation and revitalization.

Since 1994, the South African Government has undertaken massive reforms aimed at addressing rural poverty and the inequities inherited from the past apartheid regime. Amongst other programs, the government has adopted ambitious new water legislation that promotes equity, sustainability, representivity and efficiency in order to ensure beneficial use of the water resource. The legislation creates an enabling environment for decentralization of water resource management through the creation of new local and regional institutions, water allocation through water users' registration and licensing as well as protection of the resource.

The project focuses on the situation of the numerous SISs that are located in former homelands of South Africa<sup>5</sup>, and that now face the new

---

<sup>4</sup> Tlou and Mallory

regulations. This chapter first describes the plight of those areas and its origin. It also highlights the past and current institutional arrangements regarding access to water and irrigated land, and describes the ones that are implemented within the framework of the National Water Act (Act No 36 of 1998, further named NWA in the text). It finally emphasizes the social, economic and institutional challenges, issues, possible contradictions and threats related to the application of the NWA to SIS.

As part of its tenure reform initiative the Government published the Communal Land Rights Bill in 2003, and gazetted the Communal Land Rights Act in early 2005.

The objective of the chapter is to contextualise the project, and to help understand the situation and environment of small-scale irrigation schemes in South Africa.

## 2.2 THE ESTABLISHMENT OF SMALL-SCALE IRRIGATION SCHEMES

### 2.2.1 History

At present, South Africa has an estimated 1.3 million ha of land under irrigation for both commercial and subsistence agriculture. Irrigation was introduced to South Africa soon after the arrival of European settlers, then developed steadily, especially from early 20<sup>th</sup> century onwards, in both private and public sectors. Bruwer & Van Heerden (1995), then Van Averbeké *et al.* (1998) described thoroughly this evolution, stressing especially the early gap that existed between white- and black-oriented irrigation policies.

In the former homelands, minor irrigation developments occurred before 1950. Most irrigation schemes were started after the publication of the report of the so-called Tomlinson Commission on the socio-economic development of the Bantustans (Union of South Africa, 1955). This report and the implementation of some of its recommendations had a major effect on settlements, land use patterns and irrigation development in

---

<sup>5</sup> From the Natives Land Act of 1913 on, a number of Native areas (also called Bantu areas – Tomlinson Report, 1955) were delineated according to ethnic, geographical and economic criteria, and formed “reserves” for black people. Such spatial discrimination was developed and implemented further under the apartheid regime. Reserves (rather called homelands from the 1960’s onwards) were granted some form of autonomy from central government. Some of them ultimately were declared self-governing independent states (Bantustans), although not recognized internationally. Homelands and the so-called independent Bantustans have all been re-incorporated into the country in 1994.

black rural areas (Van Averbeke *et al.*, 1998). Its effects are still very noticeable today. More details on that report, its recommendations and effects are provided in Chapter 4.

### 2.2.2 The Current Situation and Recent Developments

At the end of the apartheid era, existing small-scale irrigation schemes in South Africa conformed to the following types:

- Bureaucratically managed small-scale schemes, partly or fully administered formerly by the government or its agencies (corporations) which carried out most farming operations on behalf of farmers. Most of the existing small-scale irrigation schemes conform in varying degrees to this category. Such schemes have high recurrent costs and are usually a large financial burden on the State; their usual aim is to help farmers produce their own food and possibly a surplus for sale;
- Community schemes or garden schemes, which are numerous but usually very small in size and supported at the outset by NGOs, development projects or government departments. After several years, many of them collapse due to lack of maintenance and the unavailability of the management skills and capacity requirements in the communities. Some of them remain operational and are maintained by community users or their representative. Subsistence is the major objective underlying such schemes;
- Several State or corporation financed schemes (such as sugar cane) for which government provides infrastructure down to farm gates. Farmers pay a subsidized tariff for the irrigation water and make most farming and management decisions. Such schemes are rare in South Africa;
- Several large estate schemes, which are State or private sector financed, often managed by agents whose aim is to maximize the use of resources through production of high return cash crops (e.g. tea, coffee, fruit, etc.). There is generally little farmer participation, farmers being more supervised farm-workers than decision-makers.

The current situation indeed reflects the origins and evolution as described earlier. SISs cover approximately 46 000 to 47 500 ha (Bembridge, 2000; Limpopo Province Department of Agriculture -LP-DAE, 2000) as former homeland schemes, and about 50 000 ha as garden schemes and food plots. Almost half of them are located in the Limpopo Province (171 schemes represent 20 000 to 22 000 ha<sup>6</sup>). It is

---

<sup>6</sup> Last figures by the rehabilitation programme at LP-DAE actually indicate about 126 schemes, considered worthy of being rehabilitated / revitalized (2004, De Lange, personal communication; Arcus Gibb, 2005)

estimated that two thirds of South Africa's SIS are dedicated to food plots, the purpose of which is subsistence, and that 200 000 to 230 000 rural black people are dependant at least partially for their livelihood on such schemes.

Bembridge (1996, 2000) states that the performance and economic success of SIS in South Africa have been very poor, and "*fall far short of the expectations of planners, politicians, development agencies and the participants themselves, and that despite huge investments*". It should however be acknowledged that economic success was not the original objective for the development of the schemes. Because of South Africa's history, the policies of the past were aimed at promoting subsistence-based activities by farmers in order for them to meet their basic needs and not necessarily for the schemes to create economic surplus (Shah & Van Koppen, 1999). In addition, and contrary to the assumption made by the Tomlinson Commission report, irrigated small-scale families diversified their activities and livelihood systems, especially with massive migration of male labour (Perret, 2002). With the migration of male labour to the mines, the social profile of small-scale irrigation schemes changed with the end result being that women and pensioners remained in the schemes, and carried out extensive food crop and livestock farming. The picture thus painted is one of unclear security of land tenure, land rights and water rights (Merle *et al.*, 2000; Perret *et al.*, 2003).

It is worth noticing that the gradual shift in the underlying paradigm of SIS in South Africa (i.e. from subsistence purposes to productivity, economic performance and financial autonomy) did not reflect any shift in the administrative structures and organisational arrangements to achieve the changing focus and objectives of these schemes (Perret, 2002). Most schemes were developed for social and food security purposes during the apartheid era, in the early 1960s. From the early 1980s, management agencies (corporations) were faced with such financial and social problems that they encouraged farmers to make cash profits, in order for them to pay back production costs and services. However, food security remained the major objective and crops and production patterns remained the same, along with weak market opportunities and poor agribusiness environment. At the same time, due

to infrastructure degradation, consultants were hired to set up rehabilitation plans. Hence, the more sophisticated technologies (pumps, sprinkler irrigation) that were introduced in certain schemes, and which require even higher capital, operation and maintenance costs (Perret, 2002).

Following (and in certain instances before) the dismantlement of apartheid, management agencies were liquidated and government gradually withdrew from the functions it used to perform in SIS (service, technical advise and extension, training).

In the Limpopo Province, it is acknowledged that most of the 170 SISs are moribund and have been inactive for many years (NP-DAE, 2000). Recently, Arcus Gibb (2005) identified 126 schemes that, although not all operating, have been targeted for rehabilitation and revitalization (Denison, 2005). Several causes have been mentioned to explain the plight of SIS, namely infrastructure deficiencies emanating from inappropriate planning and design, and/or poor operational and management structures, both beneficiaries and government assigned extension officers lacking technical know-how and ability, absence of people involvement and participation, inadequate institutional structures, inappropriate land tenure arrangements (IWMI, 2003). In the Eastern Cape and KwaZulu-Natal, most schemes are also facing major infrastructural and institutional problems, along with local political power games that have characterized those schemes from the outset, and that hinder effective problem solving (Perret, 2002).

Since the late 1990s, provincial governments have set up rehabilitation and management transfer programs across the country (Eastern Cape Restructuring Authority, 2001; NP-DAE, 2000), although the approaches have been very diversified in each case. For provincial departments, the underlying idea is undoubtedly to curtail the heavy financial burden of SIS, as most of them are not contributing to the commercial agriculture stream. On the other hand, departments would like to promote the emergence of small-scale commercial farmers (which is also the objective of the Department of Agriculture), as well as maintaining the community subsistence function of the schemes.

Still, all rehabilitation and reactivation efforts face the same dilemma, i.e. how can the social and economic aspects of these approaches to SIS be reconciled? The National Water Act of 1998 and The Restitution of Land Act (1994) provided an opportunity to re-think the paradigm underlying

SIS development in South Africa and to develop new institutions, and the challenge which now faces administrations is to establish viable and sustainable small irrigation schemes in the face of a changing environment.

### 2.3 NATIONAL WATER ACT

The National Water Act of South Africa is internationally recognized as the most promising legal framework to adequately address the countries' challenges in water management (Hamann & O'Riordan, 2000; Perret, 2002) unclear security of tenure and property rights on land and water resources (Merle et al., 2000; Perret et al., 2003).

It is worth noticing that the gradual shift in the underlying paradigm of SIS in South Africa (i.e. from subsistence purposes to productivity, economic performance and financial autonomy) did not reflect any shift in the administrative structures and organisational arrangements to achieve the changing focus and objectives of these schemes (Perret, 2002). Most schemes were developed for social and food security purposes during the apartheid era, in the early 1960s. From the early 1980s, management agencies (corporations) were faced with such financial and social problems that they encouraged farmers to make cash profits, in order for them to pay back production costs and services. However food security remained the major objective and crops and production patterns remained the same, along with weak market opportunities and poor agribusiness environment. At the same time, due to infrastructure degradation, consultants were hired to set up rehabilitation plans. Hence, the more sophisticated technologies (pumps, sprinkler irrigation) that were introduced in certain schemes and which require even higher capital, operation and maintenance costs (Perret, 2002)

Following (and in certain instances before) the dismantlement of apartheid, management agencies were liquidated and government gradually withdrew from the functions it used to perform in SIS (service, technical advise and extension, training).

Although highly commendable, the NWA has to deal with several objectives (i.e. resource protection, social equity and development, economic efficiency) that may at face value show contradictions in terms but in reality are complimentary in nature. These objectives are difficult to implement in a context of resource scarcity, severe backlogs in rural areas, competing users, needs for economic performance and job

creation, etc. This creates a strong dilemma, which is reflected in the different streams of thought inside the Department of Water Affairs and Forestry –DWAF (Schreiner et al., 2000; Rouzere, 2001; Karar & Van Koppen, 2004), and in the implementation features of the Act. The overall task seems challenging if a balance has to be obtained between at least maintaining the current production capacity of commercial agriculture, modernizing developing agriculture and creating new off-farm employment opportunities (and added value) that reduce poverty in rural areas (Backeberg & Odendaal, 1998).

One of the key features of the NWA is the establishment of Water User Associations (WUA) with a view to decentralising responsibility and decision-making on water resource management to the lowest level. Currently the focus has been on transforming the larger irrigation boards to WUAs while incorporating other users such as small-scale irrigators into the WUAs. There has been very little progress however with the establishment of WUAs so far (Rouzere, 2001; Perret, 2002; Mazibuko, 2004).

On a practical level, the NWA also remains unclear about the implementation features of several key issues (e.g. water rights and local institutions, water market). This forces the DWAF to operate on a case-by-case basis, which is time consuming and expensive (Rouzere, 2001; Mazibuko, 2004). The lack of skilled manpower means that external consultants, who are not liable for their recommendations and advice, are resorted to. Such an approach, however, seems unavoidable at the moment (Mazibuko, 2004).

#### **2.4 IRRIGATION AGRICULTURE IN THE CONTEXT OF SMALL-SCALE IRRIGATION SCHEMES**

Irrigation refers to the purposive, organized, controlled, and artificial supply of water to a cropped area, in order to complement rainfalls and to overcome drought, and to reach a given crop production objective (although irrigation may also serve other secondary objectives –fighting frost or certain parasites-) (Clement, 1981; Jones et al., 1990). Irrigation includes the mobilisation of the resource, its conveyance, distribution, then in-field application (Clement, 1981). Small-scale irrigation or small-scale irrigation refers to such practice, as carried out by small-scale farmers or small-scale farmers, over limited areas, not exclusively for commercial purposes, and mostly using family labour (D'Haese & Kirsten, 2003).

As discussed in the previous paragraphs, the development of small-scale irrigation systems in South Africa has often followed a top down approach with very little input by the farmers these schemes were intended to serve. This explains why farmers have had little control over, and sometimes little interest in the sustainable and profitable operation of running such schemes (Backeberg & Groenewald, 1995; Bembridge, 1996).

The NWA has been difficult and slow to implement in the realm of small-scale irrigation farming, due to a number of uncertainties and contradictions regarding the objectives and prospects of SIS. A key issue will probably be to set clear objectives for SIS, on an individual case basis (Perret, 2002). The ones with a good potential for sustainable irrigated productive activities should have clear, irrigation-oriented, and protected water rights, as well as irrigation WUA for sound local water management. If this happens, water rights and their management might become levers to alleviate poverty and promote local development.

A brighter future depends not only on water-related matters, but also on sound institutional and market-related environment (IWMI, 2003). Especially land tenure systems should be revised and secured for SIS farmers.

South Africa's new water policy faces a difficult transition period. It has to deal with the legacy of apartheid and the history of SIS. If well managed, the NWA may form a powerful tool to achieve equity, poverty alleviation and development in rural areas. Early experiences in South Africa and internationally show that sound, cautious and State-controlled implementation remains necessary.

Having thus provided the background for investigations that took place into several topics, (*inter alia* the technical and socio-economic situation of case study schemes; the links between land tenure systems and the performances, and the ways small-scale farmers value water) in this chapter, the next chapter will set out the approach to the research and the methods used to meet the aims of the project.

### 3 APPROACH AND METHODS

by C.J. Williams<sup>7</sup>

#### 3.1 THE APPROACH

The approach to this research is predicated around the hypothesis stated in Chapter 1, namely "Land tenure and support structures have an effect on the long-term viability of Small Irrigation Schemes". The key element of this hypothesis is long-term viability (and sustainability) of SISs, seen in the context of several variables which impact on viability and sustainability. As implied by the hypothesis, the key variable is land tenure, and the other variables (referred to as support structures or system) which were selected for consideration as being representative of the environment surrounding SISs are:

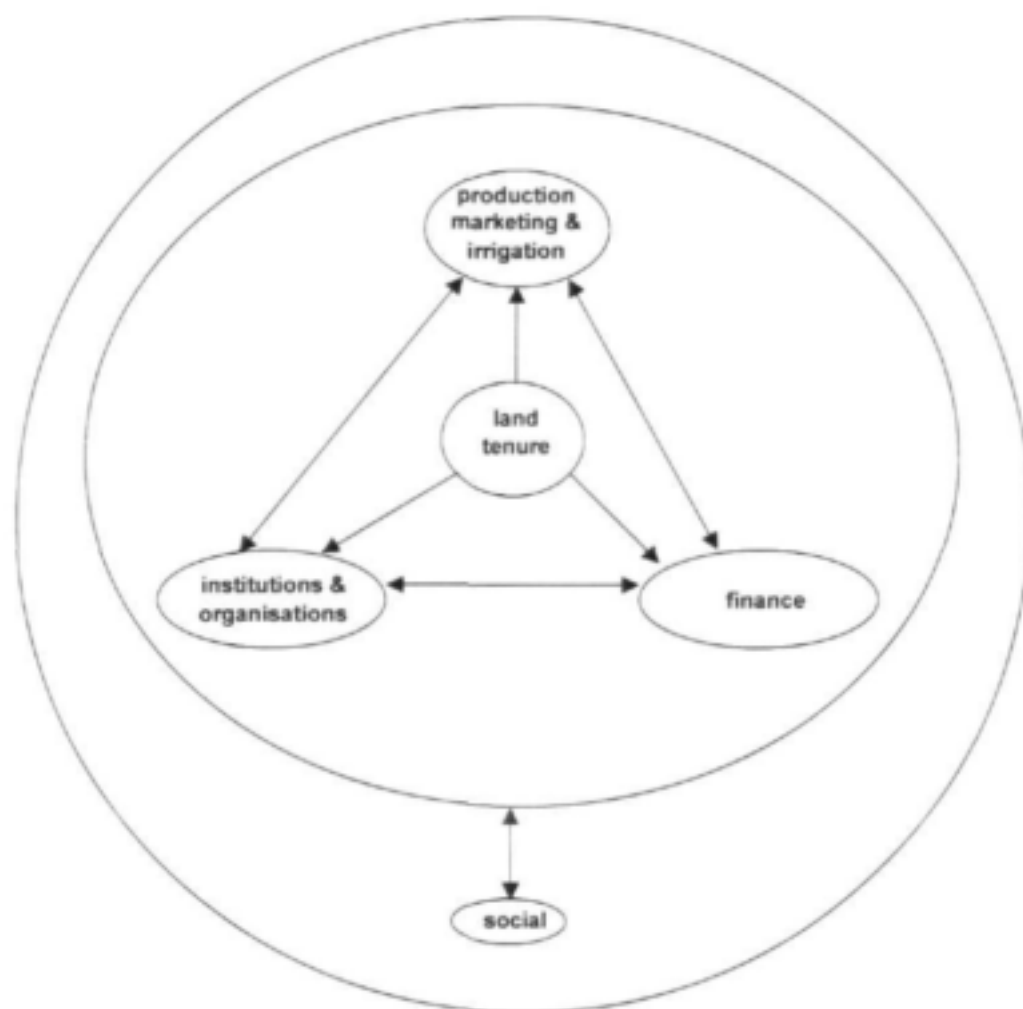
- finance;
- production and marketing;
- irrigation;
- institutional and organisational; and
- social issues.

The concept is depicted in Figure 3.1. Land tenure is placed at the centre of the system and, in so doing requires interactions between various sub-systems to continually refer back to the land tenure issue. The conceptual framework has been structured in such a way as to ensure that the focus of the research remains with land tenure, and that the whole action is played out against the pervasive background of the social issues which have formed the core of the development of many SISs.

---

<sup>7</sup> Economic Project Evaluation (Pty) Ltd.

FIGURE 3.1: BASIC FRAMEWORK



## 3.2 THE METHODS

### 3.2.1 Literature

An examination of the available literature dealing with the subject of different farm tenure systems and support structures for establishing small-scale irrigation farmers in long term viable conditions was carried out. The purpose of surveying the literature was to identify the issues raised that are related to this subject, to highlight critical areas and apparent gaps in previous research and to identify data which could be used in conjunction with data being collected in the field.<sup>8</sup> The critical issues highlighted by the literature that relate to the various support

<sup>8</sup> A concise setting-forth of the findings of this survey is contained in Appendix A.

systems being researched are discussed in more detail in Chapters 4 and 6 to 9.

Thus it will be seen that these investigations were both guided and supported by literature. In other words, the literature suggested the initial approach to be taken, and as the investigation developed also provided data where on site data was not available.

### 3.2.2 Case Studies

Data which would provide an understanding of the variables mentioned above, their interactions, and their impacts one upon the other were also investigated through field research on existing SISs.

Case studies which would enable these relationships to be showcased were selected for this purpose.

#### 3.2.2.1 Criteria for selection of Case Studies

In order to remain generic enough, and to address situations that are somewhat representative of the overall situation, the selection of those case-study schemes had to be undertaken on the basis of sufficient information and of an adequate set of criteria. Guidelines and criteria for such a selection were agreed upon within the project team, as follows:

- some form of **productive activity** must be occurring
- Diversity in **size** (e.g. large  $>600\text{ha}$ -, medium  $-200$  to  $600\text{ha}$ -, small  $<200\text{ha}$ )
- Diversity in **farmers' plots size**
- Diversity in **land tenure system** (PTO and by-arrangements, free-holding, quitrent, etc.)
- Diversity in **farming orientation and style** (from subsistence to commercialisation)
- Diversity in **financial features** (existence and sources of loans, banking systems)
- Diversity in the **local institutional settings** (FO, CPA, Trust, WUA, informal, PTO by-arrangements, etc.)
- **Location** in both former Transkei and Ciskei
- Diversity in **farming systems** (cash crops, perennial crops, food crops, etc.)
- Diversity in **irrigation system** (from gravity to pressurised systems)
- Diversity in **bulk supply** (river, dam, groundwater)

Additional **external criteria** had also to be considered, such as the **availability of data** on the scheme (especially pre-feasibility/feasibility studies on infrastructures), and on the farming systems, on the scheme's

environment (markets, communities). However, shortage of information should not count against potentially interesting schemes. Schemes that have been obviously over-investigated during the past 5 years, resulting in some kind of fatigue or frustration by the farmers should be avoided. Schemes that have long been objects of political games and/or recurrent setbacks, numerous and unsuccessful revitalization processes will be avoided as well. Finally, practicalities such as access, remoteness, and accommodation must be considered in order to make fieldwork possible for the Masters students.

To contextualise the information gathered through literature review, and to make well-focused recommendations, and to ensure that findings are site-specific, analysis of selected case-study schemes was carried out and discussed. This analysis, alongside the perspective provided by the literature, will be found in Chapters 4 and 6 to 9.

### 3.2.2.2 *Final Case Study Selection*

Details of the case study selection process are presented in Chapter 5. In summary, the sites selected were:

- Zanyokwe because it is well established, has experienced the vicissitudes of time, and it exhibits a wide spread of the variables to be investigated; and
- Mngazi because it is a recent scheme evidencing a history which pointed to a successful future, and it provided the promise of research into the social and cultural issues of SISs.

Having selected appropriate case study sites, data was collected in the field from both sites. Methods used were SMILE (Sustainable Management of Irrigated Land and Environment) for the quantitative data (production etc), and structured discussions guided by checklists within the Sustainable Livelihoods framework for qualitative data. These methods and their application are dealt with in the next section, and in Chapter 5.

As research progressed, a framework for assembling and correlating data collected emerged. This framework, taking the form of a matrix, was the realisation of a path followed by the researchers in their data collection activities, and it used both data that had been collected in the field, and where this was not available, data supplied by the literature. This matrix framework is discussed later in this chapter, and again in Chapter 10.

It is of note that the data gathering efforts were designed to meet both the requirements of this project, and the requirements of the Masters theses of two students who were involved in the project, and whose studies were funded by this project. As a result, only certain aspects of the final data database were relevant to this project. These data were fitted into the framework whilst others were not.

### 3.2.3 Data Collection,

As mentioned in the previous section, two frameworks, SMILE and the Sustainable Livelihoods Framework were used to support data collection. These two frameworks were originally set up with quite different aims. SMILE provided a framework in which technical aspects of farming such as costs, farmer typologies and crop profitability could be analysed, and which would provide quantitative output relating to differing farming methods under varying circumstances. The Sustainable Livelihoods framework, on the other hand, provided a means of gaining an insight into how interpersonal relationships and community structures affected the ability of enterprises to obtain sustainable livelihoods from their efforts.

Zanyokwe, with its many farming enterprises operating side-by-side with a variety of operational problems, was considered a suitable environment in which to obtain diverse site specific quantitative data. Mngazi, on the other hand, was a smaller, more cohesive operation which had already obtained some success towards sustainability. Despite that fact that this endeavour had split into two, there was still evidence that a community approach was underpinning their success. It was therefore decided to make use of SMILE to collect quantitative data at Zanyokwe, and to use the Sustainable Livelihood Framework to explore in a qualitative manner the dynamics of the communal effort at Mngazi.

The **SMILE** platform as used at Zanyokwe consists of five input modules that form the basis of the information system, as interfaces for data capturing by the user.

- the **Cost** modules, which generate output variables that reckon the costs incurred by the scheme and its management for each cost centre;
- the **Crop** module, which generates micro-economic output variables that allow comparative evaluation of crops in terms of profitability, land productivity, and water productivity;

- the **Farmer** module which captures the different farmers' types, with their cropping systems and farm statistics and generates type and scheme -related output variables when combined with the **Scheme** module; and
- the **Water** module which deals with water balance at scheme level.

SMILE is documented in more detail in Appendix C.

In Zanyokwe, information and data were collected through individual farmer's interviews, by means of a structured questionnaire. The questionnaire includes topics such as household composition, agricultural production, livelihood system, land tenure, farm expenditure, access to credit, and problems associated with supply, production and marketing in the scheme in general, as perceived by the interviewees. In each one of the six villages that form Zanyokwe, respondents were selected using a snowball sampling method with the researcher following up contacts mentioned by early respondents. Fifty-five out of a total of 64 farmers were interviewed in Zanyokwe Irrigation Scheme.

Prior to farmer's interviews, group discussions were held to collect general information about the scheme, regarding the vulnerability context and the economic environment of the scheme. Extension officers, project management team members, and certain farmers participated in these discussions. Also, such discussions helped establishing a first sample for individual interviews.

Data analysis considered the 55 questionnaires as being representative of the diversity of situations in the scheme. It is understood that findings could not be generalized beyond the scheme, and that accuracy of information and relevancy of further recommendations depend heavily upon the quality of information given by the respondents.

A **Sustainable Livelihood Framework**, which has been developed by DFID to address and link up different aspects of rural people's livelihood and to support its description and analysis, was used at Mngazi. The framework represents the inner operation of a household by taking into account issues such as assets, livelihood strategies, and their associated outcomes. Whilst this framework, which is specified in more detail in Appendix B, is not specific to small-scale irrigation, it served as a guideline for interviews and for structuring the data that were collected during semi-structured group discussions.

In Mngazi, a three-day fieldwork was organised in February 2003, where group discussions were held with members of the two farmer groups,

and also with several local stakeholders (the initiator of the scheme, the local extension officer). Such discussions were guided by a checklist of topics such as production features, input supply and marketing issues, organisation patterns at individual and collective levels, institutional aspects, and overall livelihoods. The checklist matched broadly the frame of the sustainable livelihood framework (the conceptual frameworks used can be found in Appendix C).

Apart from these fieldwork sessions, both schemes and their financial, extension, and economic environments were investigated through short term missions performed by different research team members, in the course of 2003 and 2004.

It was intended that the final data-set obtained from the field visits would enable the relationship between the variables to be demonstrated qualitatively and as far as practicable, quantitatively. In practice this was not fully realised, and data garnered from the literature was used to supplement the field data.

### **3.3 SYNTHESIS OF FINDINGS**

#### **3.3.1 Summarising Impacts**

It was foreseen that when it came to analyse the impacts of different tenure systems, there would be many cross-links between land tenure and the various supporting systems. It would be difficult (as well as being impractical) to try to pinpoint any one system as making a prime contribution to the success or failure of the schemes studied from the raw data collected. It therefore became necessary to synthesise the data such that the aggregated impacts of all systems, one upon the other, might be highlighted. With this in mind, the various impacts were graded in severity during the data gathering and analysis phase and entered into a matrix of the type shown in Figure 3.2

FIGURE 3.2: MATRIX OF SYSTEM-ON-SYSTEM IMPACTS

	land tenure	production	marketing	irrigation	financing	institutional	social	all	definitions
land tenure	0	0	0	0	0	0	A	D	freehold, quitrent, communal, trust, leased
production	0	0	0	0	0	0	0	0	quantity and quality of output, crop selection
marketing	0	0	0	0	0	0	0	0	effectiveness in reaching markets
irrigation	0	0	0	0	0	0	0	0	adequate water, appropriate irrigation systems
financing	0	0	0	0	0	0	0	0	access to, and effective management of, finance
institutional	0	0	0	0	0	0	0	0	WUAs, CMAs, CPAs, Acts
social	B	0	0	0	0	0	0	0	Community attitudes, skills bases, level of training
all	C	0	0	0	0	0	0	0	

NOTE: All impacts are row upon column

The cells in the matrix record the magnitude of the impacts of the various system, one upon the other. This is a two-way record, so that the impact of, say, land tenure on finance as well as the impact of finance on land tenure are quantitatively presented, and the two values may well be quite different from one another. In all cases, the impacts are of row upon column. For example, the impact of land tenure (row) upon social issues (column) would be recorded in the top right-hand cell (A) of the matrix, whilst the impact of social issues (row) upon land tenure (column) would be recorded in the bottom left-hand cell (B) of the matrix. Similarly, the impact of all issues upon land tenure would be represented in cell C, and the impact of land tenure on all other issues would be represented in cell D.

In filling in the impacts in the matrix above, 0 would denote no impact; a low number would denote a low impact whilst a high number would denote a significant impact.

The use of a matrix such as this enables an overall picture to be developed of the relative importance of various systems in influencing the viability and development potential any scheme.

It must be appreciated that the picture which emerges is only a synthesis of the data which have been presented and is neither definitive nor

rigorously defensible<sup>9</sup>. It does, however, bring a high degree of order into the confusion which inevitable arises when considering a number of interacting systems such as is being done in this research.

Furthermore, this matrix makes it possible to highlight areas where the magnitude of the impacts is likely to stress either long-term viability or development potential of the scheme under investigation.

A discussion of the case study schemes using this matrix will be found in Chapter 10.

### 3.4 CONCLUSION

This chapter has set out the approach and methods used to research the viability of SISs in the study area. This has involved investigating a number of schemes, identifying two schemes to use as case studies, and then performing an in-depth study of these.

It should be noted that data collection had to meet the needs of the students involved in this study, and as a result, not all data collected could be used. Furthermore, at the time data collection was predicated, precise relationships between the variables could not be foreseen and consequently the final data set did not completely fill the needs of the project. As it was not practical to repeat the collection of field data, the literature was used to supplement collected data where necessary.

The next Chapter will describe the two selected case studies in detail.

---

<sup>9</sup> To be more rigorous, the importance of the various systems vis-à-vis each other would need to be weighted, and aggregates would be represented by a weighted average rather than a simple sum of the elements. In addition, the severity of impacts allocated to each cell in the matrix would need to be determined in a more formal fashion, perhaps using a pair-wise comparison technique before a panel of experts. Such an approach is beyond the scope of this research.

PART TWO

## 4 LAND TENURE IN SMALL-SCALE IRRIGATION SYSTEMS

By D Mosaka<sup>10</sup> and WJ Mullins<sup>11</sup>

### 4.1 INTRODUCTION

Many, many literature sources were consulted as a precursor to writing this Section. As a result a rigorous citing of sources would add detail to, and detract from the readability of, the Section. Where references are pertinent, they are included in the text: where no references are cited, the comments should be taken to be those of the authors, supported by their research, and personal knowledge and experience in this field.

After independence many African governments, like the colonial governments, have over time shown little respect for or understanding of the land tenure systems practised by the majority of the rural African people. The Governments often did not appreciate that land tenure institutions were invariably unique and developed over time to suit the local needs of a specific ethnic group. The result was that they either tried to impose systems on the people that they did not approve of or just ignored and carried on practising their own system. During the colonial period a dualistic system developed in Africa where private or free hold tenure systems existed alongside the so-called tribal areas. In the post-colonial period governments have struggled to untangle this web without upsetting production and economic growth. It is, however, well known that in many African countries these efforts have not been successful and agricultural production has stagnated.

African land tenure institutions are rooted in value systems and grounded in religious, social, political and cultural antecedents, which make them vulnerable to outside intervention (Taylor, 1988).

Within Southern Africa, the link between tenure and government is found in the colonial and post-colonial belief that indigenous or traditional tenure systems are incompatible with Western or "modern" systems of government, as well as the associated economic and financial institutions (Taylor, 1988). In order to examine this question and its implications it is necessary to discuss tenure security and then describe

---

<sup>10</sup> Mosaka Associates

<sup>11</sup> Conningarth Economists

the various generic tenure systems, their possible evolution and their relevance to development in Small-scale Irrigation Schemes (SIS).

The South African land question has no easy solution. The historical imbalances created by the colonial history of the country and the 1913 and 1936 land acts are vast. It is not only the imbalance in land ownership but also the imbalances created by different policies in education, training and opportunities between the population groups that must be addressed

#### 4.2 DEFINITION OF LAND TENURE SYSTEMS

A land tenure system can be broadly defined as the right of an individual or group to the use of a certain piece of identified land. This right to a piece of land can also be broadly classified as secure or insecure. In the following paragraphs an attempt will be made to discuss the conditions for secure tenure.

The scholarly literature on tenure places emphasis on the fact that the various types of tenure (including the "registered title") can be secure or insecure depending on social, legal and administrative institutions in a given society. Security of tenure is associated with four sets of rights. The relative security of any specific tenure system depends upon the basket of secured rights associated with that system. The different rights can be summarised as follows: -

- **Use rights:** are rights to grow crops, trees, make permanent improvement, harvest trees and fruits, and so on;
- **Transfer rights:** are rights to transfer land or use rights, i.e., rights to sell, give, mortgage, lease, rent or bequeath;
- **Exclusion and inclusion rights:** are rights by an individual, group or community to exclude others from the rights discussed above; and
- **Enforcement right:** refer to the legal, institutional and administrative provisions to guarantee rights.

These four major categories of property rights define uses that are legitimately viewed as exclusive and also define who has these exclusive rights (Feder and Feeny, 1991). Rights may also have a temporal dimension. In parts of Africa and South Asia, for instance (as was the case in medieval England) rights to the crop are private whereas rights to the stubble after harvesting are communal. In parts of Africa, land and tree tenure is separate. In addition, rights may specify conditions affecting types of rights transfer and parties to who such transfers may be affected (Feder and Feeny, 1991).

Institutional arrangements include instruments for defining and enforcing property rights, be they formal procedures, or social customs, beliefs, attitudes and so on, determining legitimacy and recognition of these rights (Taylor 1988). Enforcement often requires a buttress of instruments such as courts, police, financial institutions, the legal profession, together with land surveys, property records and record keeping systems and land titling agencies.

Tenure systems can be categorised on the basis of those who enjoy exclusive rights. On this basis all tenure systems fall into four broad categories: open access, communal, private and state (see Table 4.1).

**TABLE 4.1: CATEGORIES OF LAND TENURE SYSTEMS**

CATEGORY	OWNERSHIP OF EXCLUSIVE RIGHTS
Open Access Communal Private State	None Defined group Individual or legal entity Public sector

Source: Feder and Feeny (1991)

Table 4.1 and the discussion about rights make it possible to say that the exclusivity of use by an individual or group of a piece of land therefore defines the degree of tenure security.

In South Africa the policies and actions of the state in pursuit of racial segregation and the promotion of an oppressive migrant labour system has over the years influenced the pattern and forms of land holding. Four land tenure systems have evolved in South Africa over time, and these are discussed in the following sections.

#### 4.2.1 Freehold Tenure

Under this system the owner is accorded full ownership and freedom to alienate and use the land at will, but subject to statutory restrictions. Previously in South Africa, African freeholders were not allowed to sell their land without state approval. They were also prevented from accommodating any other person on the land outside their immediate families.

Much, if not all of South Africa's so-called commercial farmers' right to land (tenure) is vested in freehold, and as such has acquired a lot of

status as a tenure entity among commercial farmers and financial institutions.

#### **4.2.2 Quitrent Tenure**

A grantee of a quitrent title is allocated a surveyed residential site, a surveyed arable plot of about 4 to 6 hectares, and rights to commonage. One of the main differences between freehold and quitrent systems is that in the latter an annual rent is payable.

This form of tenure was mostly found in rural villages and on certain irrigation schemes. In many small rural towns the system is still in use and is the commonage managed by the local authority (Cross and Haines, 1988).

#### **4.2.3 Communal Tenure**

Under communal tenure, members of a settlement share certain rights in the land attached to their settlement. They hold the land under conditions of usufruct, as opposed to private ownership. Access to a residential plot is often acquired through a certificate of permission to occupy (PTO). In addition to an arable land allocation, the bearer (household) is entitled to raise livestock on the commonage and to harvest wood and water from it. The ownership of the crop harvest rests with the individual grower (household), the crop residue can be removed from the land for individual use where after the rest becomes communal property. Livestock is then allowed to graze on the lands specifically during winter.

This system of tenure also referred to, as "traditional land tenure systems" is the predominant tenure system in the former homelands.

Under the communal tenure, exclusive rights are assigned to the group. Certain rights can also be assigned to an individual or families under traditional tenure systems.

#### **4.2.4 Trust Tenure**

Land under trust tenure consisted of formerly white-owned land situated in proclaimed native areas, which was eventually made available to South African Native Trust through the Native Trust and Land Act of 1936. This land was subsequently allocated to Africans on a system of leasehold tenure.

Different models were used in this exercise to accommodate both individual farmers and groups of farmers. Very often in today's terminology this land is also referred to as "State land available for redistribution".

The systems were not however exclusively used for black farmers, but were also used in some cases to settle white farmers on land from which black communities had been removed. The farmers initially received the trust land on leasehold tenure, which was later converted, to freehold. [Cross and Haines 1988]

#### **4.2.5 Discussion**

As stated, historically freehold tenure has acquired a very important position in commercial agriculture in South Africa and is often perceived to be the only tenure that encourages high agricultural productivity. One of the results of this perception has been the unwillingness of private agencies to make production and capital loan funding available to producers involved in other types of tenure as conveyed in personal communication to research team members.

The unwillingness of the rural population on communal tenure land to accept the possibility that they might lose certain of their cropping or grazing rights in the event of not repaying a loan has assisted in fostering this attitude.

The challenge to policy makers and other affected parties is therefore to create an environment in which it would be possible for the private sector to get involved. If that does not happen the result would be that the Government or semi-government institutions will always be responsible for the financial needs of population on communal tenure land. The problem, however, is that the need for funds could be so large that Government might not be able to cope, given their intention to transfer more land to black farmers.

#### **4.3 HISTORY OF LAND TENURE SYSTEMS IN SMALL-SCALE IRRIGATION**

This history of land tenure in small-scale irrigation must be understood against the background of the prevailing political system during the 20<sup>th</sup> century. As is well known, a policy of active segregation was followed, and as far as agriculture is concerned Africans were only allowed to farm in predetermined areas.

In the former Tribal or Native Areas, minor irrigation developments occurred before 1950. Most irrigation schemes were started after the publication of the report from the so-called Tomlinson Commission on the socio-economic development of the tribal areas (Union of South Africa, 1955). This report and the implementation of some of its recommendations had a major effect on settlements, land use patterns and irrigation development in black rural areas (Van Averbeké *et al.*, 1998). Its effects are still very noticeable today. Based on information collected from existing schemes, the Commission suggested that irrigated holdings of 1.3 to 1.7 ha were adequate to “family with a living that would satisfy them, whereby the whole family would work on the holding”. It also proposed that:

- “Determined action be taken to improve and re-plan all existing schemes, so that each holding can provide a full-time living to a Bantu family”;
- “New schemes, which can be operated by simple diversion of weirs and furrows, be developed during the next 10 years”;
- “The Trust (referring to the Native Trust and Land Act of 1936; the South African Development Trust acquired land from non-African owners within the Scheduled Native areas for redistribution to African people, under management of the Department of Native Affairs,) should acquire ownership of the land, all land belonging to individuals or tribes and which fall under the proposed schemes should be bought up [...] and former owners should be given preference when holdings are allotted on completion of the schemes”;
- “All schemes should be placed under proper control and supervision, with uniform regulations as regards water rates, credit facilities and conditions of settlement ...”

Preliminary surveys estimated that the irrigation potential of the Tribal Areas was about 54 000 ha, sufficient to settle 36 000 families. Schemes developed during the late 1950s and 1960s followed most of these recommendations (Van Averbeké *et al.*, 1998). They would employ a relatively inexpensive design (furrows would convey water from a weir or a dam), and aim at a family’s subsistence through surface irrigation.

During the 1970s, the so called self governing states were encouraged to become independent on a political and administrative level, resulting in the withdrawal of central government, and homelands’ administrations taking-over (homelands’ parastatal corporations were created, e.g. Tracor in Transkei, Ulimocor in Ciskei, ARDC in Venda, Gazankulu, Lebowa, etc.)

The result of these actions was that different business models were used, not only by the different homelands but also by the South African Development Trust during the 1970s and 1980s.

In the schemes developed in the Tribal Areas on communal land the participants came from the immediate community and retained their housing and grazing rights. The schemes were all centrally managed (white managers) and the participants either had identified pieces of land or shared in any group profits that might arise. This tenure was as secure as any tenure under communal arrangements allowed for. The farmer had user rights but no rights that allowed him to sell or lease the land.

Land under the control of the South African Development Trust (SADT) was mostly land that was bought from white farmers and was earmarked for incorporation into the homelands. The former participants were mostly people that were uprooted under the so-called "black spot" consolidation process and resettled in these areas. In a few cases attempts were made to actually settle individual farmers on economic units, but in most cases a community based tenure system was used, with the participants having housing, grazing and cultivation rights.

The net result was that the schemes were centrally managed with the participants being no more than labourers with very little decision making power. In the case of the land very few schemes were transformed and most of them remained under the control of SADT, which became in effect a very big farmer. Therefore in most of the schemes the tenure was similar to communal tenure with all the rights associated with communal tenure.

#### **4.4 CURRENT SITUATION AND POLICIES IN TENURE SYSTEMS**

The current situation around tenure systems must be understood against the background of the present land reform policies of the government. It is therefore necessary to recapitulate policy initiatives and development since 1994 and then to discuss the current tenure situation.

Land reform encompasses any change, which redistributes land. Because land is a finite resource and its ownership is generally symbolic of wealth, social status and political power, all forms of land reform are political in nature. Land reform, therefore, often involves restructuring patterns of wealth, income flows, social status, and prestige and so on, and these are the very basic elements or ingredients of politics. Land

reform is perceived as a revolutionary process that passes power, property and status from one society group to another.

Since the transition to democracy, land reform in South Africa has been pursued under three broad headings:

1. Restitution, which provides relief for certain categories of victims of forced dispossession;
2. Redistribution, a system of discretionary grants that assist certain categories of people to purchase or otherwise acquire land; and
3. Tenure reform intended to secure and extend the land tenure rights of the victims of past discriminatory practices. It involves changes in the rules that govern land and related property rights. This explains then the close association between land reform and land tenure reform, and why these two often go together.

The framework for land reform policy is set out in the White Paper on South African Land Policy (the White paper), released in April 1997 and based on an extensive consultative process. Despite major changes in land reform programmes, considerable turnover of senior personnel in the Department of Land Affairs (DLA), the White paper has not been revised or superseded since its publication, and thus remains the official statement of government policy on land.[Agric SA, personal communication]

#### **4.4.1 Restitution**

The restitution process has been successful in that a number of land claimants have received their land back and that certain target dates have been put in place for the process to be completed. However production has in many of the cases collapsed and the communities are economically not better off. In some cases the claimants have accepted financial restitution instead of the land itself. This has mostly happened in the urban areas.

It must, however, be remembered that the motivation behind the restitution process was to redress the injustices of the past and restore the land rights of the communities and not the maintenance of production. The next challenge is to empower the people to become productive again and make these farms profitable units.

#### 4.4.2 Redistribution

According to the 1997 White paper the purpose of the land redistribution programme is to provide the poor with access to land for residential and productive uses, in order to improve their income and quality of life. Also to eventually bring about a more equitable land ownership situation and provide black people with agricultural land. The programme aims to assist the poor, labour tenants, farm workers, women, as well as emergent farmers. Redistributed land reform will be largely based on willing-buyer/willing-seller arrangements. Government will assist in the purchase of land, but will in general not be the buyer or owner. Rather, it will make land acquisition grants available, will provide support and will finance the required planning process. In many cases, communities are expected to pool their resources to negotiate, buy and jointly hold land under a formal title deed. Opportunities are also offered for individuals to access the grant for land acquisition.

In this statement, and throughout the White paper, the aims of the programme, the intended beneficiaries and the envisaged benefits are clearly spelled out. The principal beneficiaries are to be 'the poor' (including labour tenants, farm workers and women), and emergent farmers. Whilst these are not necessarily distinct categories, the intention remains clear – to provide access to land for previously disadvantaged groups and individuals. Such affirmative measures can be seen as promoting the constitutional imperative of equity. The application of the willing buyer, willing seller principle has meant assisting groups previously excluded from entering the existing land market, alongside other actors, without diminishing the rights of existing landowners.

The intended beneficiaries of the land redistribution programme are to be provided with access to land for either residential or productive use, or both, in order to improve their income and quality of life.

#### 4.5 TENURE REFORM

##### 4.5.1 White Paper Policy Guiding Principles

In the White paper on Land Reform the following policy guiding principles were listed to guide the process of tenure reform as envisaged by the Government.

The following section is quoted verbatim from the 1997 White Paper.

- **Tenure reform must move towards rights and away from permits:** This entails a commitment to the transformation of all 'permit based' and subservient forms of land rights into legally enforceable rights to land.
- **Tenure reform must build a unitary non-racial system of land rights for all South Africans:** This entails a commitment to developing a system of land registration, support and administration, which accommodates flexible and diverse systems of land rights within a unitary framework. It embodies a commitment to do away with the second-class systems of tenure developed exclusively for black people.
- **Tenure reform must allow people to choose the tenure system, which is appropriate to their circumstances:** In the past, governments imposed various forms of tenure with disastrous results. There is a commitment to supporting and developing a variety of tenure options, which people may then choose between. In particular, it is accepted that both group based and individually based ownership systems play valuable roles under different circumstances and the match between the circumstances and the system must be made by the people affected.
- **All tenure systems must be consistent with the Constitution's commitment to basic human rights and equality:** For example, group based tenure systems must deliver the rights of equality and due process to their members.
- **In order to deliver security of tenure a rights based approach has been adopted:** Because of overcrowding and the legacy of forced overlapping of rights, there is a risk that tenure reform and upgrading could result in dispossession and heightened insecurity for those who are currently most vulnerable. To avoid this, all tenure reform processes must recognize and accommodate the *de facto* vested rights, which exist on the ground. Vested interests would include legal rights, as well as interests which have come to exist without formal legal recognition

From the above quotation and other discussion in the document it is clear that the tenure reform measures envisaged were aimed at rural as well as urban dwellers. As this project is concerned with [rural] irrigation schemes the implications of possible implementation measures will be discussed against this background.

The first principle envisaged a move towards rights and away from permits. It must be viewed against the historical background where black people prior the 1990's were not allowed to own land outside of the tribal areas. Also the situation in the previously black tribal areas, where the right to occupy depends on the PTO system as managed by the tribal authority, was that the tenure was very insecure.

The second, third and fourth principles aimed at bringing tenure in line with the non-discriminatory and non-racial constitution of the country and establishing an institutional framework to introduce and manage the process. It would allow individuals and communities to select the tenure option that suited their circumstances the best.

The fifth principle should ensure that the *de facto* situation on the ground would be accepted as the point of departure in any development applicable to vested rights in place at a specific location.

The government has already introduced a number of acts aiming to facilitate the process of tenure reform; these will be discussed in the next section.

#### 4.5.2 Institutional Framework

As discussed previously a variety of tenure systems are practised and allowed by law in South Africa and make provision for various levels of security of tenure.

Since 1994 a number of acts have been promulgated to address tenure security and reform.

- *The Upgrading of Land Tenure Rights Act (Act no 112 of 1993)*. This act was meant to facilitate the upgrading of various forms of tenure to higher levels of tenure security.
- *The Extension of Security of Tenure Act (Act no 62 of 1997)* amends the Land Tenure Rights Act and extends security of tenure to farm workers.
- *Land Reform (Labour Tenants) Act (Act no 3 of 1996)*. This act defines so called labour tenants and introduces measures to extend tenure security to people defined as labour tenants.
- *The Communal Property Associations Act (CPAA)(Act no 28 of 1996)*. The purpose of the act is to facilitate procedures for communities to buy farms, secure tenure for the members of the association and conduct and manage the farming activities.
- *The Communal Land Rights Act (CLRA) (Act no 11 of 2004)*. The CLRA provides for the transfer of communal land to persons or communities in full ownership subject to certain conditions. The outer boundary of the land will be held communally in title of the community and the individual members of a community will be granted register able land rights for the land they occupy or use in terms of occupation and usage rights. Individual title is also possible as well as different tenure combinations.

When analysing the above acts in place to upgrade and regulate tenure security it becomes clear that only the CPAA and CLRA would possibly

impact on the small-scale irrigation schemes. However act 112 of 1993 allowed for the upgrading of Quitrent land to freehold and that did take place at Zanyokwe.

The Development Facilitation Act (No 67 of 1995) could possibly impact where municipalities expand the commonage and make it the use of the land available to small-scale farming. However the existence of the CPAA and the CLRA makes the use of this act unnecessary.

In comparing the institutional process so far with the guiding principles set out in the 1997 original White Paper, it appears that progress has been made in certain of the targeted areas.

The process to give security of tenure and user rights to people in the black tribal areas have been institutionalised, but the actual implementation process will probably take a long time. The same applies to the ideal of gender equality and the security of households with female heads. It appears to be in line with the constitution of the country and its rights rather than being process based. The possible management model variations that could be applied in these areas after the implementation of the act are evaluated in another section.

Communities buying farms in the commercial freehold areas have made extensive use of the CPAA, which has made it possible for communities to pool their resources and then qualify for state financial aid to buy the farms

This obviously satisfied the first need of the people to own their land and attain security of tenure, but most of these Community Property Associations (CPAs) have failed to farm profitably and satisfy the aspirations of their members, and a number of them have become insolvent. The reasons for these failures are many, but some can be attributed to the less than effective management systems of the CPAs and with the original formation of dysfunctional groups. This also applies to the irrigation schemes inherited from the previous government and for all future schemes to be developed for emerging farmers under the initiative of Black Economic Empowerment (BEE). Although the CPAs were formed on land where title was acquired, the group and not the individual was still the primary entity.

### 4.5.3 Successful Land and Tenure Reform Defined

As successful land reform has certainly been one of the greatest challenges in agricultural development all over the Third World it is necessary to take a closer look at the defining motivation for land reform.

"The definition of success depends on goals. Land reform has traditionally had two main objectives: equity and productivity. The equity objective is closely associated with political egalitarian issues and has often and for long over shadowed the productivity and efficiency issue – for example post-revolutionary reforms in the USA, reforms in Western Europe following the French Revolution, Latin American reforms after 1910. It was also the case in USSR land reforms after World War I, early East European reforms following World War II and the reforms in Korea, Japan and Taiwan after World War II" (Tuttan, 1999). One has to add, though, that the latter three countries have since shown increasing agricultural growth, which in the case of Japan, was a continuation of a process starting in the mid-nineteenth century.

Agricultural growth and development cannot occur in a vacuum; modern agriculture depends for its development on linkages, just as the contribution of agriculture to the economy depends on linkages, with other sectors. Mosher (1971, chap.1) summarised the activities affecting agricultural performance as commercial agricultural-support activities, non-commercial agricultural-support activities and the agricultural-milieu.

In line with the above the challenge for the Government would be to arrange land and agricultural matters in such a way that equity is reached and productivity is maintained and improved. Not only should household food security be secured for the beneficiaries of the land reform program but also the reforms should contribute to the overall food security and economic development of the country.

Success in land and tenure reform clearly does not depend only on principles and conditions; it ultimately depends on execution and on delivery. People and institutions have to formulate policies, devise means, procedures and administrative bodies to do the job. Action ultimately has to be taken by people, institutions and organisations. It is in the inability or unwillingness to deliver that cause many policy programs to flounder and fail. This can easily happen to land reform. Sociologists have argued that once expectations have been aroused for improved conditions, smashed dreams become dangerous.

In South Africa the main political role players have all accepted the need for land and tenure reform and the debate has moved to how to accomplish the ideals and help the beneficiaries to become successful. As far as tenure reform is concerned commentators appear to be all in agreement that tenure security must be attained. The debate has oscillated between the supporters of the total free market approach to land and tenure security and the people who supported the approach where the community and the individual cannot lose their tenure security.

The viewpoint is often expressed (Anim and Lyne, 1992), which if an asset is open to all users, it tends to be over utilised, unlike assets subject to more restrictive property rights. Under open access, land resources are over utilised in the economic sense and investment is low (Lyne and Nieuwoudt, 1990). On the other hand, with private tenure, the incentive to invest is higher and rates of utilisation are lower because the cost of resource degradation is internalised (Baber, 1991). The argument basically carries on by stating that security of tenure is not enough, but that a process of private tenure (freehold) must be introduced and only by introducing this would the financial and economic future of the people be secured and indirectly tenure security attained.

At the other end of the argument is an agreement that tenure reform alone will not solve the deep-rooted problems of poverty and underdevelopment in the communal areas. Tenure security is only seen as the first step that can pave the way for inward investment, more effective use of natural resources and protection of individual and community rights (Lahiff, 2001). From this flows the assumption that with government support and substantial redistribution of land outside the former homelands the problems can be solved. The community structure and co-operative management remains an integral part of any future development. In this model no provision is made for private sector investment in the communal areas and even on commercial land where communities are farming.

Inherent to the two extreme viewpoints is the agreement that tenure security is important but that tenure options associated with different models must be developed. In between these two extremes is the argument that no land redistribution program can succeed without a clear tenure policy. According to Kinsey and Binswanger (van Zyl, Kirsten & Binswanger, 1996) there are four major issues concerning tenure: -

- a) whether to allow individual holdings of arable land or insist on collective methods for farming;
  - b) whether to grant permanent ownership rights or only usufruct rights;
  - c) whether to allow sale and rental of land or constrain land transactions; and
  - d) if land sales to outsiders are unrestricted, whether or not to issue title.
- This viewpoint is more pragmatic and highlights the different options available to choose from without propagating only one option.

This sub-section starts by highlighting the preconditions for a successful agricultural and land reform policy and ends with the options available under different tenure options. It is therefore necessary to go back and analyse the applicable acts to see what tenure options are available and their possible influence on different community and production factors. After that a look will be taken at the situation in the case study area.

#### **4.5.4 Analysis of Applicable Acts**

Although a number of acts and amendments addressing tenure security and options have been passed by parliament only two will impact on small-scale irrigation schemes. It has therefore been decided to only discuss these two in more detail.

##### **4.5.4.1 *The Communal Property Associations Act (Act no 28 of 1996).***

The act was enacted to make it possible for groups of people to form under the jurisdiction of the act an association to buy farms and obtain tenure security for the members of the association. Most of the redistribution and restitution land transfers after 1996, have been acquired, registered and managed using the CPA act.

However, as previously discussed, the act has not been very successful in actually helping the members to make a success of their farming ventures. A number of reasons could be put forward explaining this, of which some are the formation of dysfunctional groups, and problems associated with acquiring production credit and lack of management skills.

The act makes no provision for individual decision-making and also makes no provision for voluntary withdrawal from the CPA, although this could possibly be accommodated in the rules and regulations of the association.

The main accomplishment of the CPAA is making it possible to acquire land and secure tenure; however the main weakness is the cumbersome

management style inherent to the process, and the difficulty in getting the private financial sector involved.

#### 4.5.4.2 *The Communal Land Rights Act (CLRA) (Act 11 of 2004)*

The act makes provision for the registration of a community to acquire a juristic personality and to: -

- acquire and hold rights and incur obligations; and
- own, encumber by mortgage, servitude or otherwise and dispose of movable and immovable property and otherwise deal with such property subject to any title or other conditions.

In the act a community is defined as follows: -

"community" means a group of persons whose rights to land are derived from shared rules determining access to land held in common by such group.

The important aspect is that the act makes provision in another section that an individual can also hold title to land, and is stated as follows: -

*9. (1) The holder of a registered new order right may apply to the community owning the land to which such right relates for the conversion of such right into freehold ownership.*

Without over-emphasizing the issue, but by reading the goals of attaining juristic personality by communities and 9.(1) together the only deductions that can be made are that freehold title and leasing and even disposal can take place under certain conditions. Obviously conditions will apply and the changes will only happen gradually over time but the possibility of the development of land markets now exists. It must also be stated that the act is not clear on the question of land leased or disposed of to non-community members and the following section in the act is made in terms of any application to convert to freehold: -

*9 (3) If a community approves an application in terms of subsection 9 (2), it may impose any condition or reserve any right in favour of the community*

It can also be deduced that the act makes provision for a wide range of tenure and management options, freehold and individual management, leasing of land, quitrent tenure and communal tenure and management. It would probably involve a process of first getting title in the name of a

specific community and then investigating management and tenure options.

The law prescribes that at least one third of the members of a land administration committee to be established in terms of the act must be females and that the members must be people not holding any traditional leadership position. This will encourage gender equality and also curtail the powers of the traditional leadership in so far as land allocation is concerned.

One other possibility that is created by the act is that a CPA can convert itself to fall under the CLRA. That would then make it possible for communities to acquire land using the CPA and then explore alternative tenure options with the accompanying management style changes that can be introduced.

#### 4.5.4.3 Discussion

The CPAA and CLRA are both enabling acts that empower communities and individuals to either acquire or upgrade the security of their tenure. The CPAA allows communities to form associations and access funding to buy commercial farmland. The CLRA will control the process that will allow communities to get title to communal land and over time even allow certain parts to explore alternative tenure options.

It therefore becomes necessary to compare the perceived strengths and weaknesses of each tenure option and in later chapters discuss the influence on certain production, institutional and social issues.

#### Freehold Tenure

The following perceived strengths and weaknesses have been identified by the authors as being inherent to the freehold tenure option.

#### Strengths

- The tenure option is the accepted option for most of the commercial agriculture in South Africa.
- The private financial providers accept the tenure option as the preferable option to make credit available to farmers and that it also acts as security to credit providers.
- It is perceived to encourage entrepreneurial initiative and encourage capital investment.
- Encourage long-term decision making rather than just short term. In the case of orchards and forestry this acts as encouragement to invest with the view of long-term benefits accruing.

- It leads to a healthy land market that fits in with a modern economy.

#### Weaknesses

- By putting up land as security to access credit, the farmer exposes his/her family to the possibility of losing their home in cases where credit cannot be repaid.
- As land is a finite resource the application of free market principles can put land out of reach of the less wealthy section of the population.
- The free hold system can often lead to the forcing out of the smaller farmer and the possibility of monopolies becomes a reality.
- High land values ties up a lot of capital, especially in the case of young or developing farmers and becomes effectively dead capital.

#### Communal Tenure

The following perceived strengths and weaknesses have been identified by the authors as being inherent to the communal tenure option.

#### Strengths

- The system is rooted in the cultural system of the Rural African Population.
- The individual knows and understands the working of the system.
- Over many years it has contributed to the stability and security of the rural population.
- The community provides a safe haven for the individual.
- The interests of the group are more important than the needs of the individual.
- It is easy to proceed from the communal set up to a co-operative management plan, because the people understand the concept.

#### Weaknesses

- The existing perception that the system suppresses individual entrepreneurial skills.
- The system also finds it difficult to access development funding and is dependent on the Government. Private financial suppliers are of the opinion that they will find it difficult to recover debts in the case of default by the borrower.
- Decision-making is often very cumbersome and in a fast moving business environment, its strength of community involvement becomes its weakness.

#### The Middle Ground

The debate in the South African context has often portrayed the situation as a choice between freehold and communal, as if there is no middle ground between them. These extremes often ignore the possibility of

exploring the middle ground. The Quitrent tenure option is a good example of a solution where rural people could retain their use rights to secure a family homestead and grazing rights but could lose their user rights in the case of irrigation land.

A community or association can decide to have their grazing communal, homesteads freehold, and irrigation land leasehold or also freehold. An arrangement like this would secure their homestead but would expose their irrigation activities to a market situation. It could encourage entrepreneurial development and perhaps encourage the private financial sector to become involved.

In many African countries the Government has side stepped the issue of land ownership and has made land available to private entrepreneurs on long leases. This system is not unknown in various European and other countries and by making the lease-period long enough and tradable, capital has been sourced and permanent structures have been erected. The main condition is that the lease period must be secure and long enough to make it worthwhile for the farmer to invest capital and recover it. This option is now a possibility with the promulgation of the *Communal Lands Rights Act*.

Without being prescriptive the above examples are used to show the flexibility of the CLRA and the wide range of options that could be implemented over time. It would be the task of the community, planners and advisors to develop the best possible option for the beneficiaries. It would be a process of guiding the communities to select the best option for their needs and implement it.

The CLRA has moved the debate on tenure arrangements forward in a South African context in that it opens the door for many possible combinations of use and exclusive rights on SIS.

An analysis of the farming arrangements in the communal areas shows that the present situation has some overlapping characteristics with the quitrent tenure option. The grazing is communal but the crops and the homes are for own use. The application of the CLRA can give tenure security to the individual in the community while retaining many of the practises that they are used to.

### 4.5.5 Situation on the Case Study Sites

#### 4.5.5.1 Zanyokwe

According to records the land originally identified for irrigation at Zanyokwe was in private hands held by quitrent and freehold tenure. At the time to get the process moving farmers would receive a rental for the land while they underwent training at Fort Cox and the farms would be farmed as an estate for a period. After a two-year period the farmers would return and proceed with the farming operation.[van Averbek et al, 1998]

In a survey at Zanyokwe the 55 respondents gave the following answers in response to the question about tenure:

**TABLE 4.2 DIFFERENT TENURE OPTIONS IN PLACE AT ZANYOKWE**

Tenure Option		
Permission to Occupy [Quitrent]	22	40%
Freehold	23	41.8%
Leasing	10	18.2%

Source: - Ntsono (2005)

If the answers given are a correct interpretation of the respondent's actual tenure situation it appears as if the quitrent option has been included in the PTO that refers to state land with permission to occupy and use. Accepting that leasing also refers to freehold it appears as if freehold tenure is the dominant option. It could, however, also be argued that leasing could be the same as PTO leasing from Government and then freehold would still be a very large section of the options.

It must, however, be kept in mind that the interpretation of respondents about their actual legal position might be wrong. This could only be determined by a detailed investigation of available title deeds and other papers. It is, however, clear that many of the present farmers classify their tenure as freehold.

It appears that it would not be difficult to sort out the tenure situation on the scheme by using CLRA and bring stability to the area. CLRA could be used to bring security to the people holding only PTO and clarity about the precise status of the other tenure options.

At Zanyokwe the quitrent- and leasehold options could be implemented not only to encourage production but also make it possible to explore various funding possibilities and still retain certain use rights.

#### 4.5.5.2 Mngazi

At Mngazi the land is "state land" and used by the groups in a communal way. CLRA now makes it possible to stabilise the tenure security of the community and from there move forward in the management and development of the land. The first implication could be that the title of the land is transferred to them and then in line with their social tradition a tenure and management option that suit their needs could be developed.

## 4.6 CONCLUSION

In the preceding paragraphs it was shown that four tenure systems were clearly distinguished and used in South Africa. The two mostly practised are freehold and communal. A number of tenure options are used to regulate and manage farming operations on the irrigation schemes. In many of the land restitution and land redistribution transactions since 1994 the communities have opted for Community Property Associations (CPA) to manage the operations. Although these CPAs satisfied the social side of the community it is not very successful as a business instrument for a number of reasons. In many instances dysfunctional groups were formed that were very difficult to manage. The CPA as a holding unit made it very difficult to secure long term funding due to financial institutions being worried about the recovery of their funds.

In the case of schemes on communal land individual ownership was in many cases not an option and the scheme was seen as an extension of the communities' activities as regulated by the community structures. In most of the schemes this led to the situation that the schemes were not perceived to be commercial entities that must become economically sustainable. However the CLRA has the potential to change the situation, as it could become the instrument to bring stability to the tenure situation on the schemes.

As discussed in the previous paragraphs the decision on a specific tenure option within the specific system would not only depend on a single aspect but would involve a number of issues, so any tenure option decided on would affect a number of related decisions. Prospective

irrigation farmers would have to accept the reality that if they farm as an association without clearly demarcated plots, private financial providers would not become involved.

Cognisance must be taken of the traditions and wishes of the local people, but simultaneously they must also understand the possible limitations of the option that they have chosen and the possible consequences that might follow.

Government's role would be to create the policy environment and establish the institutions to support and implement the policy. The private sector must accept that they have a role to play when the appropriate policy is in place to allow them to become involved.

As explained in chapter 3 it is necessary to quantify the influence of the different external and internal factors that might influence the future success of the SIS. The proposed matrix is used to quantify the influence of land tenure on the identified and analysed production and social issues, a scale of 0 to 3 was used where a 0 indicates no influence and 3 a very influential influence.

These ratings (duly weighted vis-à-vis one another) were arrived at by the project team, acting as an expert panel, based on the discussions and findings in this chapter. The same approach is used in other chapters using this matrix for summarising impacts.

- **Land tenure on production** – the conclusion is that land tenure is very important for the entrepreneurial and personal development of the individual; the range of products that can and will be produced and a 2 is allocated.
- **Land tenure on marketing** - land tenure has an indirect influence on marketing, if a cooperative production system is chosen the marketing option is cooperative while if an individual tenure and production system is preferred marketing can be cooperative or individual and therefore a 1 is allocated.
- **Land tenure on irrigation** - the land tenure option chosen can influence the selection of a irrigation system, the influence is however not large and a 1 is allocated.
- **Land tenure on financing** – land tenure definitely affects the possibility of individuals and groups to acquire production and capital finance from the private financial sector and a 3 is allocated.
- **Land tenure on the institutional, organisational and management arrangements** - the conclusion is that land tenure will strongly influence management arrangements but will have a very small, if any, influence on institutional and organisational issues and a 1 is allocated.

- **Land tenure on the social structure of rural people** - any tenure system that either excludes or diminishes the influence of the community will have a very large influence on the social structure of the people and a 3 is allocated.

An analysis of the matrix in the Matrix 4.1: Land Tenure shows that land tenure has an influence on all the other identified factors and a total of 11 out of a maximum of 18 are attained and is a indication of the importance of tenure in small holder irrigation schemes.

FIGURE 4.1: LAND TENURE MATRIX

	land tenure	production	marketing	irrigation	financing	institutional	social	all	definitions
land tenure	0	2	1	1	3	1	3	11	freehold, quitrent, communal, trust, leased
production	-	-	-	-	-	-	-	-	quantity and quality of output, crop selection
marketing	-	-	-	-	-	-	-	-	effectiveness in reaching markets
irrigation	-	-	-	-	-	-	-	-	adequate water, appropriate irrigation systems
financing	-	-	-	-	-	-	-	-	access to, and effective management of, finance
institutional	-	-	-	-	-	-	-	-	WUAs, CMAs, CPAs, Acts, management
social	-	-	-	-	-	-	-	-	Community attitudes, skills bases, level of training
all	-	-	-	-	-	-	-	-	

NOTE: All impacts are row upon column

## 5 DESCRIPTION OF SELECTED CASE STUDY SCHEMES

by Prof S Perret<sup>12</sup>

The on-site analysis of selected case study sites is an integral part of the research underlying this report. In this Chapter, the rationale behind the selection of the case study sites will be given, followed by a description of the main characteristics of each site.

### 5.1 SELECTION OF CASE STUDY SCHEMES

Based on the criteria for selecting the case study sites as set out in Chapter 3, Approach and Methods, visits were made to various schemes with a view to collecting data which enable the selection of appropriate sites for further study to be made.

#### 5.1.1 Field Visits

From such a base, a short list of schemes for visiting, further scrutiny, and eventual recommendations, in consultation with local stakeholders, was compiled. The schemes that were ultimately visited are:

**Ciskei:** Zanyokwe, Horseshoe, Keiskammahoek.

**Transkei:** Imagingqi, Mngazi, Zikolwethu, Vukani-Mathole.

The objectives of the field visits were:

- to carry out **on-site evaluation** of the short-listed schemes, in terms of the criteria set out in section 3.2.2.1;
- to gather as much **information** as possible (*inter alia* figures, photos, comments by local stakeholders and contacts), including topics of interest for other team members, and so that final selection can be discussed with the rest of the team;
- to come up with **recommendations** for scheme selection and for research organisation and scheduling.

Although short, the list of visited schemes shows a huge diversity (as shown in Tables 5.1 & 5.2), therefore matching the terms of reference. More particularly, criteria such as local institutional arrangements (forms of organisation) and land tenure systems proved extremely rich and diverse.

---

<sup>12</sup> University of Pretoria and CIRAD

The only significant shortcoming related to bulk water supply and irrigation systems, as all visited schemes perform sprinkler irrigation, use pipes for conveyance, and extract water from a river with means of a pump (either thermal or electric) (exception: Keiskammahoek).

### **5.1.2 Findings from Field Visits**

A series of views, statements and comments have been recorded while talking to EC-DOA staff members and farmers. They form an interesting background for the research. Some of the findings by the team are reported as follows:

First, the team has been facing the lack of available written documentation on the schemes. No document seems to be kept at EC-DOA offices in East London. The team has been advised to identify consulting agencies on that matter.

TABLE 5.1: SYNOPTIC INFORMATION ON THE IRRIGATION SCHEMES VISITED IN CISKEI

Name	Location (+ name of extension officer)	Size (irrigated) Farm size Unit = ha	Number of farmers	Institutions	Land tenure systems	Major crops	Finance / loans (support)	Market outlets	Implements	Water resource	Irrigation systems
Horseshoe	Ciskei Middledrift (Dysope)	120 (57) +/- 2.5	20 (10 women) + 13 others	CPA with a chairman	CPA from PTOs	Cabbage, vegetables, groundnut maize	Land Bank loan to CPA (R132,000/year for production costs) (support by EC-DA)	Easy, local KWT	Vandalized Contractors Complete range of tools	Buffalo River	Electric pump, pipes, sprinklers
Zanyokwe	Ciskei Middledrift (Mbane)	534 (+/- 400) +/- 3 to 5	64 + others non farming	6 farmers associations forming a Trust	Freeholding Guhrent Communal Leasing agreement	Vegetables Maize Some dryland cropping	Loans through the Trust by Uvimba (support by EC-DA + Public Works + DWAF)	Problematic (transport) local and Alice, KWT...	Tractor association	Kedamma River (shortages)	Electric pump, pipes, sprinklers
Keiskammahoek	Ciskei Middledrift (Hele & Manoni)	802 (very diverse per farmer)	144	7 production units = 7 milking parlours = 7 coops 1 Trust 1 WUA not registered yet	PTOs Freeholding Communal	Pastures (dairy) + some crops (on 2ha farm)	Individual loans + Other financial support through the Trust (support by EC-DA, Dept Public Works, ESKOM, Land Bank, Dept. of Labour, DWAF, etc.)	Contract with Clover (quote on milk) + direct whole sales	Not vandalized	Nyameni & Cala dams on the Keiskamma River (just one water shortage in 1993)	Gravity pipes, sprinklers

TABLE 5.2: SYNOPTIC INFORMATION ON THE IRRIGATION SCHEMES VISITED IN TRANSKEI

Name	Location (+ name of extension officer)	Size (irrigated) Farm size Unit = ha	Number of farmers	Institutions	Land tenure systems	Major crops	Finance / loans (support)	Market outlets	Implements	Water resource	Irrigation systems
Mngazi	Transkei Port St Johns (Zibi & Fono)	38 (collective)	20 + 19 (2 groups A & B)	2 projects, 2 groups of farmers sharing a piece of communal land and 1 electric pump	PTO (direct farming and collective management by PTO holders)	Maize, groundnut, all sorts of vegetables, beetroots, green peppers	(support by EC-DA)	Neighbouring cities Umhata, Libode, Lusikisiki, PnJ Group B gross income from sales in 2001 = R96 000		Mngazi River (always running)	Electric pump, pipes, sprinklers. Farmers share the pipes
Imagingo	Transkei Port St Johns (Zibi & Fono)	40 (managed like one farm)	6 PTO holders hiring 17 permanent + 20 casual labourers	A board of 6 directors, one of them is the farm manager. Nightwatch against vandalism/theft	PTO (collective management by a board of absentee PTO holders)	Maize (green mealies) Cabbage Spinach Other vegetables		Neighbouring cities Umhata, Libode, Lusikisiki, PnJ	1 hand tractor some basic tillage implements	Mngazi River	Electric pump, pipes, sprinklers
Zikobethu	Transkei Ngendul (Ngqishe)	37	10 (1 is the founder-leader and manages 15ha)	Informal arrangements between a founder-leader and a group of PTO holders	PTO with a form of a lease / borrowing of PTOs to non-farming holders	Green mealies, cabbages, spinach, potatoes, onions, started the oranges	To individuals Land Bank & Umhata (lower R) Founder-leader	Easy and successful roadside sales		Nggungu River	Electric pump, pipes, sprinklers
Vukani-Mathole	Transkei Ngendul (Ngqishe)	14	11 (7 women) young	Farmers Association with a Chariman	PTO (direct farming and collective management by PTO holders)	Cabbage, onion, spinach, potatoes, pumpkin, maize	No loans, no debts (problems paying inputs and diesel) (support by AngloGold, EC-DA)	Local marketing to communities (easy) Road problems limit access		Noakana River (non permanent, shortages)	Diesel pump, pipes, sprinklers

There is indeed a strong willingness to act towards revitalisation by EC-DOA, which has been very active on supporting small-scale initiatives in communities (e.g. Nqanduli district, with a number of very small SISs at community level).

EC-DOA extension officers are, in some instances, directly in charge of the scheme's daily operation and management (Keiskammahoek), of monitoring, facilitation, and technical and institutional advice (Zanyokwe, Mngazi), of organising input supply (Horseshoe, Zanyokwe), or market outlets (Keiskammahoek). It looks like EC-DOA is taking over some of the functions of the former parastatals. This follows the too quick withdrawal of any support and scheme management after the dismantlement of parastatals.

In most visited schemes, farmers do not seem to be ready for autonomy and self-organisation, although the rule seems to be: the smaller the scheme, the more autonomous (and somehow well working). Everywhere, the role of EC-DOA officers seems to be instrumental.

The application of the water legislation (the emergence of WUAs, registration processes, license allocation processes) does not seem to be a priority at that stage. The team even found a certain lack of information on that matter at EC-DOA level.

**Keiskammahoek** forms a specific case in the sense that farmers are not really involved in any collective decision-making. They just abide by the scheduling of the milking parlour they belong to, the rest is individual (pasture irrigation, animal husbandry). Upstream (inputs) and downstream production issues (marketing), as well as certain services (vet) are centrally managed. Also, in that scheme, farmers' ageing seems to be problematic.

At **Imagingqi**, the so-called farmers are farm labourers. The board of directors, as PTO holders, takes all decisions. In the Nqanduli area, there are apparently a number of those so-called private schemes (ran like businesses by individual or small groups of absentee PTO holders)

**Horseshoe** is also a bit specific as nothing has happened there for a while, except from some dryland farming. The collapse of the scheme after Ulimocor was dismantled created a void, and this scheme, (once well equipped with tractors, implements and machinery, a brand new truck) suffered vandalism and theft.

A group of farmers (50% women) is now willing to start irrigation vegetable farming (from November 2002 on), with the support of EC-

DOA (fencing, supply of seedlings). They formed a CPA, with PTO basis for land tenure, and got a loan from the Land Bank. The whole setting and plan sound very promising. It might be worth-monitoring the running of operations, as well as the financial features (repayment of the loan).

In other small schemes, the individual decision making takes place at the outset of any crop cycle, when it comes to deciding the level of involvement on a given crop (contribution to buying seedlings and inputs). Then, the rest is all collectively decided, yet with apparently some orientations given by a respected chairperson or leader-founder (PTO arrangements in **Mngazi, Zikolwethu, Vukani-Mathole**). **Mngazi** looks very sound and successful, with two strong farmer groups. It might be worth analysing the operation of that scheme.

**Zanyokwe** has a chaotic history. It currently looks fairly active and productive, after some revitalisation and upgrading investments. This big scheme is definitely worth studying, for its size, its inner diversity in land tenure system, cropping systems, institutional arrangements and the like.

All in all, the general impression is that the visited SISs are promising and even successful at the moment, yet with the shadow of bitter past experiences.

At the moment, resorting to external support keeps being a reflex. Especially when it comes to equipment and infrastructure, farmers are not aware of the costs incurred, and of their duties in terms of maintenance and use.

But at the same time a very constructive, optimistic, even enthusiastic willingness to do well by farmers (as seen at Horseshoe, Mngazi, Zanyokwe, etc.). This takes shape with various local arrangements regarding farmer organisations, and access to land and markets.

### 5.1.3 Final Selection of Case Study Schemes

On the basis of these initial investigations, it was decided to use Zanyokwe and Mngazi as case study sites. The former was chosen on the basis of the wide range of land tenure and other support systems in operation. The scheme was also a well-established one which had been through a variety of trials and tribulations and at the time seemed to be falling into the doldrums. Mngazi, on the other hand, was a newer scheme which, although lacking the diversity shown at Zanyokwe, appeared to be holding its own, and even flourishing. Concentrated exercises were instituted at these two sites to gather data for detailed analyses.

The general features and histories of these two sites are given hereunder to provide the reader with some background against which the detailed findings of later chapters may be read.

## **5.2 ZANYOKWE IRRIGATION SCHEME**

### **5.2.1 General**

The Zanyokwe Irrigation Scheme is situated about 20km west of King William's Town, along the R63. On that road to Fort Beaufort, after Dimbaza, a gravel road starts from the R63 (on the right, 20km before Alice) and serves the various sections that form the Zanyokwe scheme, then the Sandile Dam, then Keiskammahoek further North. That gravel road broadly follows the Keiskamma River valley. The Zanyokwe Irrigation Scheme falls in the Amatola District of the Eastern Cape Province. Figure 5.1 show a map of the Sandile dam and surrounds, including the Zanyokwe Irrigation Scheme.

The scheme is composed of six sections/villages, namely Zingcuka, Kamma-Furrow, Ngqumeya, Zanyokwe, Lenye, and Burnshill. It covers approximately 635 hectares but only an area of 534 hectares is irrigated, consisting of 66 individual small farms ranging from 0.5 to 10 hectares (as said before, 55 of them have been interviewed). The balance of the land is yet to be developed and irrigated. The scheme also includes an additional 78 "communal plots", 42 "communal plots" in Lenye are occupied and the 36 ones at Burnshill are not currently occupied and have not been irrigated (van Averbeke et al., 1998).

FIGURE 5.1: ZANYOKWE IRRIGATION SCHEME



The source of irrigation water to the irrigation is the Sandile Dam (see Figure 5.1). Irrigation infrastructure and equipment consist of piped irrigation systems with valve chambers and ancillary pipes. Irrigated land actually consists of relatively small plots, scattered between Lower Nqumeya in the east to Kamma Furrow in the west. All irrigated land is intended for crop production (van Averbeke et al. 1998).

The Department of Public Works and the Department of Water Affairs and Forestry have recently injected funds for upgrading the scheme, and the Provincial Department of Agriculture supports most of the projects in the scheme through various services. The rehabilitation process is underway and a farmer-training program is being done. A Water Users Association (WUA) is in the process of being set up and all the subsidies have been withdrawn.

A significant portion of the land is not cropped/irrigated (about 100ha). Uvimba Development Bank's inability to provide credit for inputs and maintenance for pumping equipment due to significant budget cuts is the most frequently mentioned reason for this.

### 5.2.2 History

In 1977, Hill, Kaplan & Scott completed a regional analysis of the natural resources in the Keiskamma River Basin. A number of proposals for the development of the Basin were formulated on the basis of the survey (van Averbeke, 1995). It was suggested that a dam be constructed along the Boma Pass, where the Keiskamma River cuts a narrow gorge through dolerite rock, and supply irrigation schemes. Hill, Kaplan & Scott (1977) recommended schemes to be developed on soils with good potential for irrigation to focus mainly on vegetable cash cropping (van Averbeke, 1995).

Plans for a dam in the Boma Pass were approved and the Sandile dam was constructed. The dam was completed in 1983. With an estimated long term yield of about 20 million cubic meter per annum and a storage capacity of 19 million cubic meter per annum, the dam was to become the main storage facility of water for a multipurpose regional water project (van Averbeke, 1996). The dam was to supply water to the urban centres and numerous rural villages located within the mid Keiskamma River Basin. In the plans, an amount of 9 million cubic meters per annum was set aside to supply irrigation schemes. The availability of a reliable and relatively abundant supply of irrigation water led to the development of Zanyokwe Irrigation Scheme.

Two consulting firms were commissioned to design the Zanyokwe Irrigation Scheme. Consulting Engineers Hill, Kaplan, Scott Inc., were asked to plan and

design the bulk water conveyance system to field edge. Loxton, Venn and Associates were commissioned to provide a master preliminary plan for the scheme. Five administrative areas were identified as potential beneficiaries of the Scheme to be developed, namely Zanyokwe, Burnshill and Lenye and Lower Ngqumeya and Zingcuka (van Averbeke, 1995).

The Zanyokwe Irrigation Scheme was a development project "formed by the community" and the Government in an attempt to improve standard of living, and to create job opportunity. The former Ciskei Government motivated the development of the Zanyokwe Irrigation Scheme in 1983 as a showpiece in irrigation farming in the area" (Rural Urban Consultants, 2003).

Loxton & Venn drew up plans for the development of Zanyokwe Irrigation Scheme in 1983 (preliminary plan) and 1984 (final plan). These plans were reworked in 1985 and implemented from 1985 onwards by Israeli company Agri-Carmel (van Averbeke et al., 1998). Essentially, the plans for Zanyokwe mirrored those implemented and developed elsewhere in the Eastern Cape by Loxton and Venn, such as Tyefu, Shiloh and Ncora irrigation schemes. The Loxton & Venn model of irrigation development consisted of centrally managed estate farming on 75-90% of the available land, and assigning the remainder of the land to the original right holders in the form of irrigated food plots or mini farms, on which they were more or less allowed to do what they wanted (van Averbeke, 1996)

Estate farming relied on expensive external management and cheap local or imported labour to perform production tasks. Projections of gross production capacity and associated income generation were used to justify the capital development in economic and financial terms (Van Averbeke, 1996). In most cases, capital requirements were considerable because irrigation development plans proposed use of sophisticated technological solutions, which were expensive (Van Averbeke, 1995).

in some cases the alienation of original right holders from their land posed problems, leading to the introduction of the Group Farm concept. The Group Farm resembled the Estate Farm, being externally managed by a "Central Unit" (corporation / parastatal) and using scheme labour in all production activities. It differed from the Estate Farm in that it was farmed on behalf of land right holders, who all had a share in the farm. In return for making their land available, land right holders would be paid an annual dividend or rental (van Averbeke, 1998).

According to van Averbeke (1998), the implementation of the Loxton and Venn model of irrigation development at Zanyokwe was constrained by two factors, namely:

1. Suitable irrigation land was scattered over a large distance, occurred in small pockets and was situated at an altitude that was insufficient to create sufficient hydraulic head to operate overhead application of water. This caused capital outlay per unit of irrigated land to be exceptionally high, and also made the recurrent cost of supplying water high, because an intricate system of pumping stations and reservoirs called for.
2. Most of the land identified for irrigation land was in private hands held by quitrent and freehold tenure, and the last thing land right holders were prepared to consider was their alienation from the land they owned. The exchange of land rights for the rights to an irrigated food plot was totally unacceptable.

Agri-Carmel implemented a plan whereby the land brought under irrigation would be farmed by Agri-Carmel as an estate farm for a three-year period. This initial phase would be followed by an interim period of two years, during which farmers would receive formal training at Fort Cox and practical training on the estate farm. Finally, all the land would be handed over to local people (van Averbeké et al, 1998).

It was agreed that land right holders would receive a rental for the use of their land during the first two phases of development. For agricultural land the initial rent was R20 ha<sup>-1</sup> per annum, which has been increased progressively to the rate of R150 ha<sup>-1</sup> per annum. Land used in the development of infrastructure, which includes farm shed, pump stations, booster pump sites, reservoirs and buildings, was subject to rental payment at rates ranging between R250 and R1000 ha<sup>-1</sup> per annum. Ulimocor paid these rentals (van Averbeké, 1995).

In 1989 Ulimocor entered the Zanyokwe Irrigation Scheme and contributed to the rewriting of the project description and the redesigning of the scheme, which took place in 1989-1991 (van Averbeké et al. 1998). Agri-Carmel finally left the scheme in 1991 to a subsidiary called Cis-Carmel and later to Ulimocor. The scheme was designed and managed by Cis-Carmel on behalf of Ulimocor, and was financed by DBSA and the so-called Ciskei Government.

Following intervention by the Development Bank of Southern Africa (DBSA), which was approached to finance the Zanyokwe Irrigation Scheme development, the in-field water supply system was redesigned to accommodate for independent management of "economically viable farming units" in future. In most cases these units were obtained consolidating the irrigable land holdings of two or more landowners. Land consolidation demanded landowners to appoint a "nominee farmer". These "nominee farmers" were trained at Fort Cox and at the scheme (during the estate phase) for which they received a R3.50 per day compensation. Training started in 1988 and the handing-over of

farm units to "nominee farmers" in 1989, which was also the time when Ulimocor become involved in the scheme (van Averbeke, 1996).

The phase involving the transfer of land lasted from 1989 to 1991. In order to give "nominee farming" a reasonable time to develop their enterprises and skills, Cis-Carmel (the local subsidiary of Agri-Carmel) and, later on, Ulimocor agreed to allow them to farm on a "no-loss" basis for a period of two years, optionally extended by one additional year. "Nominee farmers" could draw all their inputs and mechanical operations from central unit on a credit basis and received a monthly advance on production in the form of a stipend of R250 per month. This stipend was meant to keep their families afloat during interim periods when no income was derived from the sale of produce. Farm produce was expected to be marketed through Pack Mark, the marketing arm of Zanyokwe Irrigation Scheme, enabling scheme administration to control the accounts of "nominee farmers". At the end of the financial year, the scheme drew up the balance between expenses and income generated from crop sales. When the balance was positive, the "nominee farmers" were paid out the profit realised. When the balance was negative Cis-Carmel or Ulimocor would write-off the debt incurred by the "nominee farmer". In many cases, "nominee farmers" would last the three year induction period, incur debts and exit farming when required to farm for their own account. In 1994 "nominee farmers", who had accepted full independence following the end of the induction period, requested to start dealing directly with the Ciskei Agricultural Bank (CAB). Most of them failed to pay their CAB loans and did not honour the land rental agreements. In 1995, the landowners demanded that Ulimocor to pay their outstanding rentals, claiming not to have been informed by Ulimocor about the changes. Ulimocor settled the bill for outstanding rentals incurred by "nominee farmers", informed landowners, and absolved completely payment of any land rentals incurred by "nominee farmers" (van Averbeke, 1995).

Landowners fearing a loss of income responded by subdividing the "economically viable units" into the various individually owned parcels, which had been used in the formation of the farming units. This created problems, because scheme developers had removed the beacons that identified original farm boundaries. Furthermore, since the system was re-designed to supply water to the consolidated "viable unit, one of the land owners would have the hydrant positioned on his or her land whilst the others had to rely on his goodwill to access water" (van Averbeke, 1995). This situation led to tension and quarrels amongst landowners (van Averbeke, 1995 & 1996).

When the former Ciskei was re-incorporated into South Africa, the Eastern Cape Department of Agriculture "inherited" the scheme, and attempted to

rationalise the agricultural activities performed at Zanyokwe (Rural Urban Consultants, 2001).

Although the scheme was established as a major fresh vegetable production scheme, the production deteriorated due to the government's withdrawal from funding the project. This then led to the decline if not the collapse of the scheme, and the destruction of all the properties belonging to the scheme. The Zanyokwe Agricultural Development Trust (ZADT) was formed based on the principles that it will be the custodian of the assets of the Zanyokwe Irrigation Scheme and it will be responsible for the preservation of the common assets and the provision of the services to the community.

### 5.2.3 Physical Environment of the Scheme

The study area is situated in the district of Keiskammahoek at an altitude ranging between 440m to 640m above sea level. It is situated long the banks of the Keiskamma river at its junction with the Zanyokwe or Rabula tributary. Van Averbeké *et al* (1998) describes the area as temperate to warm and sub-humid with a summer rainfall pattern, which reaches a maximum in autumn and is at a minimum in winter. The climate at Zanyokwe Irrigation Scheme is semi-arid and relatively mild. The nearest rainfall station is Fort Cox, located close to the dry western boundary of the scheme. Rainfall is of showery nature and thunderstorms are quite frequent and are occasionally accompanied by hail. The mean annual rainfall is 590mm per annum and frost may occur from the middle of June to the middle of August (van Averbeké *et al* 1998; Rural Urban Consultants, 2001). Rainfall variability is high. Mean monthly rainfall data for Fort Cox are presented in Table 5.3. In the winter the sky is mostly clear and the region receives about 70% of the possible solar radiation. Summer days are frequently cloudy and overcast, resulting in about 50% of possible sunshine duration (Rural Urban Consultants, 2001).

**TABLE 5.3: RAINFALL RECORDED AT FORT COX (1930-1980) AND ESTIMATED CLASS A PAN EVAPORATION DATA APPLYING TO ZANYOKWE IRRIGATION SCHEME (FROM THE CISKEI DEPARTMENT OF AGRICULTURE AND FORESTRY, 1981)**

Month	Mean rainfall (mm)	Estimated Class A-pan evaporation (mm)
Jan	64,3	191
Feb	70,2	147
Mar	83,6	143
Apr	43,8	108
May	36,1	98
Jun	18,8	88
Jul	22,1	98
Aug	29,4	120
Sep	39,4	136
Oct	58,5	162
Nov	66,3	164
Dec	58,3	181
Total	590,9	1636

Source: Adapted from van Averbeké *et al* (1998).

The substrate at Zanyokwe Irrigation Scheme consists of shale, mudstone and fine textured sandstone of the Balfour formation of the Beaufort group sediments. Dolerite sills and dykes cover extensive areas particularly in the extreme northern and southern sections of the study area (Van Averbeké *et al* 1998; Rural Urban Consultants, 2001). Along the Keiskamma River, alluvial deposits are found.

The study area is situated in the foothills of the Amatola Mountains. Active dissection of the landscape has resulted in a rolling to hilly topography. On its way through the study area the Keiskamma River follows a slightly meandering course which has become entrenched during the process of rejuvenation caused by a relative lowering of the base level. The landscape is approaching maturity, the valley has widened out and concave lower slopes have developed (Rural Urban Consultants, 2001). The alluvial terraces are generally narrow but tend to be more extensive on the inside bends of rivers.

The distribution of soils at Zanyokwe is extremely complex and varied, yet well known and described.

The main limitations are soil depth, heavy texture and high fine sand and silt contents of soils in the study areas. Somewhat low permeability can occur on some of the heavier textured soils in the absence of correct tillage. Drainage problems occur in the hydromorphic soils. A large percentage of soils have a moderately low and low potential for irrigation (LVA, 1983). Small percentages of land in the study area were rated as having moderate or high irrigation suitability (LVA, 1983).

Hill, Kaplan and Scott (1991) indicated that the quality of Zanyokwe irrigation water is excellent. Richards (1954) cited by Van Averbeke (1998) reported also that in the area water is classified as low salinity-low sodium water and can be used for irrigation without any restrictions.

#### 5.2.4 Infrastructural Factors

The Zanyokwe Agricultural Development Trust's building i.e. workshops and administration offices are currently in a state of disrepair. Doors are broken down, walls defaced and windows smashed. Office equipment and stationery have been stolen. After the withdrawal of any support and the collapse of the scheme, no further care was taken or guarding service introduced (Mbane, 2003, personal communication).

Van Averbeke *et al* (1998) argues that one of the complicating factors at Zanyokwe Irrigation Scheme is that the difference in height between Sandile Dam and the scheme lands is in most cases insufficient to provide an adequate hydraulic head to operate pressurised irrigation systems. As a result, there was a need to build storage reservoirs to be fed from the main pipe line linking Zanyokwe with Sandile Dam. According to specifications supplied by Agri-Carmel (1985), the water supply system at Zanyokwe Irrigation Scheme had the following traits. The total demand for water to supply a net area of 731 ha with irrigation water was estimated at 7,765 million cubic meter per annum, which included a safety allowance equal to 50% of the mean annual rainfall to cater for droughts, and was based on an estimated at 40 000 m<sup>3</sup> per day, using 22 working days per month. The capacity of the main pipeline feeding Zanyokwe Irrigation Scheme with water from Sandile Dam is 40 000 m<sup>3</sup> and a second pipeline delivering 20 000 m<sup>3</sup> was planned at the time of the Agri-Carmel report (1985).

Agri-Carmel subdivided the scheme into five zones, each consisting of one or more irrigated blocks of land. Each zone has its own off-take from the main pipeline and each block its own pump station and storage reservoir. Initially it was planned that water from the storage reservoirs would gravitate to the fields. However reservoirs were not positioned sufficiently high to result in an adequate pressure head to operate the field application systems, and booster

pumps had to be added to that part of the system conveying water from the storage reservoir to field lines. At Kamma Furrow, access to irrigation water was obtained by pumping directly from the river (van Averbeké *et al.*, 1998).

The water supply system, therefore, consists of a single main pipe line from Sandile dam, with five off-take points each served by electrical pump, nine reservoirs and nine booster pumps each serving a small block of irrigated lands. At Kamma-Furrow, water is pumped directly from the river to a reservoir. The total capacity of the reservoirs is about 20 000 cubic meter and individual reservoir capacity ranges between 750 and 4000m<sup>3</sup>. The entire system is designed to operate 22 hours per day and 22 days per month. The high cost of delivering water to field edge makes water supply at Zanyokwe Irrigation Scheme an expensive operation, requiring a considerable amount of electrical energy and daily maintenance of the pumps.

In Zanyokwe, irrigation infrastructures are currently rehabilitated. However, some parts of the scheme do not receive adequate water, owing to equipment deterioration.

A lot still needs to be done on infrastructures (irrigation and water conveyance, and the renovation of buildings). Recently, the Department of Water Affairs and Forestry as well as the Department of Public Works have been busy with rehabilitation works (Mbane, 2003, personal communication).

#### **5.2.5 Agribusiness Environment: Credit, Inputs AND Produce Markets**

Access to credit, input and output markets has been a major constraint to the small-scale irrigation farmer for a long time. In terms of credit, the major problem is the lack or absence of suitable collateral against which a loan from the bank may be bonded. The scheme is located in a remote area, away from urban areas. As a result it is very difficult for the scheme to be viable due to the lack of markets for irrigated produce in the vicinity. Farmers are also having problems in organising inputs. In Zanyokwe, farmers are selling their produce to hawkers, and they sell directly from the field. The farmers have to spend the whole day in the field, waiting for the customers. As most farmers do not have transport, they need to get together and hire a small truck, if they need to sell outside the village. The hiring of a truck is usually too expensive to finance and as a result most of the produce rots on the field.

#### **5.2.6 Demography and Social Capital**

As reported in Table 5.4, the baseline survey carried out by Rural Urban Consultants in 2001 shows population figures that closely match those of the 1997 Census, and those of the Department of Agriculture and Land Affairs.

TABLE 5.4: POPULATION ESTIMATES OF THE ZANYOKWE IRRIGATION SCHEME

Year	Source	Estimated Population size
1995	Census-Amatola District Municipality	400
1996/1997	DALA	410
2001	Rural Urban Consultants-Baseline Survey	395

Sources: Census Report DALA and Rural Urban Consultants

Such figures are strikingly low, especially when one considers the millions that have been invested to far into the development of the scheme, with little return so far.

The Zanyokwe Agricultural Development Trust is the local Community Based Organisation, which is fully functional and responsible for the scheme collective management, before any WUA is established. This legal entity has been set up and registered, to oversee the smooth transition of the scheme. The six administrative areas resolved to elect representatives that will constitute a core to the formation of the Trust. The Trust is composed of landowners as well as landless beneficiaries.

### 5.3 MNGAZI IRRIGATION SCHEME

#### 5.3.1 General: History of the Scheme

The Mngazi irrigation scheme lies along the Mngazi river, between the river and the N61, about 10km East of Port St. Johns. The scheme has 20 irrigable ha; with more land which is farmed rain-fed. It involves about 40 farmers. More details are provided in Table 5.2. Figure 5.2 shows the Physical location of the scheme.

In the early 1990s, this land was lying fallow, unused mostly because of roaming cattle that disturbed cropping, and lack of fencing.

A Mr Mphakati (a priest) identified the potential of the area for farming. He discussed with the chief the possibility of bringing the land together and forming a trust with the PTO holders willing to farm. He would organise production and farmers would be paid back in kind (bags of maize) for renting out the land. The PTO holders would retain ownership on the land. They were asked to help buy fencing, and to grow crops, mostly in summer, on dryland. The land and the group of farmers were registered as a trust. At that time there was only one group of farmers.



At first, Mr Mphakati decided to crop the land alone. He borrowed land from the PTO holders and in return agreed to give 10 bags of maize per year to each PTO holder (who would not farm but let his/her land). Farmers were not much involved at that stage. Some were working as labourers. Mr Mphakati started on a small piece of land, with cabbage, beetroot and tomato that he watered with a watering can from the river. This proved very profitable so he decided to expand.

In 1996, Mr Mphakati took 6 PTO holders and he divided a piece of the land into 6 portions (15 lines each) where the members grew cabbage. Each made a profit of about R4 000. This proved to be a great incentive to PTO holders to come farming on that land.

During the same period, the MEC for Agriculture in the Eastern Cape (Mr Mamase) visited the scheme. Support was arranged; the fences were extended and initiative finally became an irrigation scheme, equipped with electric pumps, pipes and sprinklers. Farmers pooled the income generated by sales into a common bank account (trust), shared benefits and re-invested money in buying inputs for the next season. Two pumps, some fencing and pipes were donated to the scheme. One of the pumps is still operating.

Suspicion of exploitation and misuse of land and farmers' efforts by Mr Mphakati led to a split-up. It resulted into two groups of farmers being formed: A and B. Group B farmers were all PTO holders farming their plots, while group A farmers were more often farming on other owners' plots. The two groups formed two trusts, and money was pooled accordingly into two bank accounts. One pump served all, and infrastructures such as pipes were common, hence some conflicts and disputes arose between the two groups.

It seems that most problems originated from lack of agreement between farmers about the proportion of income generated from farming that should be re-invested into further farming. Some preferred to enjoy most of the profit, while others wished to reinvest in inputs, especially fertilisers.

At some stage it appears that Mr Mphakati no longer paid over the 10 bags and PTO holders decided to form their own group and to farm themselves whilst some others decided to operate as individual farmers.

Some farmers blame the split into two groups on Mr Mphakati, whilst others maintain that it could be attributed to the attitudes of certain farmers. "We were nowhere; it's Mr Mphakati who took us where we are now."

Currently, Mngazi has two groups of farmers. Group B comprises 19 members (9 women, 10 men) cropping 8 ha under irrigation and 11 ha dryland, giving 0.42ha under irrigation per farmer. Group A consists of 15 members farming on 12ha that can be irrigated. Some members cannot access irrigation and do dryland farming. This gives 0.80ha under irrigation per farmer, which puts Group A in a more profitable position than Group B, possibly also explaining the sustained issues between groups.

### 5.3.2 Evolution: Farming, Infrastructures, Environment, Support, Markets

The major change has been irrigation infrastructures. But also, under the guidance of Mr Mphakati, farmers' participation increased. Although Mr Mphakati is gone the initiative he started is still going on, even though some of the farmers do not keep up with inputs. Marketing skills have improved also and farmers have good contacts with hawkers.

Some younger farmers have also now become involved; they have their own plots to farm. The Government involvement has increased, mostly in the form of extension officers being quite active in supporting farmers on marketing and production.

Throughout the process leading to the current situation, from 1994, evolution took place (cropping systems, learning processes) and progress was made (access to new marketing options, access to equipment). Farmers are trying out new crops (onions, carrots, potatoes), or expanding by planting on larger scales (butternut).

### 5.3.3 Current Infrastructures

One electric pump is still in operation, it is mobile and can be retrieved from the river bank in case of floods. According to the farmers, one pump is enough for bulk supply, but pipes are insufficient and must be shared, hence the occasional tension situation.

Pipes and sprinklers were all subsidised at the outset. Currently, the number of pipes allows for irrigating only 8ha at a time (4 Group A, 4 Group B).

There was some misunderstanding / disagreement with Eskom regarding the amount that should be paid for electricity. The tariff is based on about R 100 per ha per month, so theoretically, farmers in

Group A pay more per person than farmers in Group B, all accounts are settled as groups, not as individuals.

There are no storage or transport facilities at the scheme or farm level. Hawkers and customers provide their own transport when buying. Farmers collectively organise a van from Kokstad or Libode for input supply. Lack of own transport is a major problem. After delivery of inputs (fertilizers), these are stored in a shack, on the other side of the road, opposite the scheme.

#### **5.3.4 Soil and climate**

Soils developed over weathered alluvial sediments from the river (terraces), according to the farmers the soil was analysed at the time of settlement and farmers are of the opinion that the soil is good and pose no specific issue. The soil appear to be deep alluvial soil with medium texture, non rocky and suitable for irrigated farming (Perret, own assessment, 26/02/2004). The soil is dark grey in colour indicating reasonably good organic matter content.

The area is frost-free and falls in the summer rainfall area with some rain in winter.

#### **5.3.5 Markets and Agribusiness Environment**

Farmers are very reluctant to go to any bank for loans, as individuals. No individual loans are being contracted. Revenue from previous harvests is managed through a common bank account. The young farmers and some other farmers want to benefit from the money held in the bank and are reluctant to reinvest part of it into farming inputs. Money is usually shared every 3 months. Savings cater for electricity bills (pumping), inputs and hired labour.

Group B has obtained a loan (R30 000) currently being repaid to Uvimba. A grant of R18 000 from the local municipality was obtained in 2002 (Group B). Both these amounts have been used mainly to support living expenditures at household levels (after serious crop failures prevented profits from farming in 2002 and 2003) and also to re-invest in further crops.

One extension officer is in charge of the whole scheme (Mr Neno), with possibly other specialists on request. His role involves advice on sources of finance / support, general technical advice, planning of cropping systems, consult / contact other specialists if necessary (e.g. crop health). He also sometimes takes samples to potential buyers. He visits

the scheme about twice a week. He is also in charge of 2 other schemes, a number of dryland farmers and some school projects.

Now that farming has proved profitable in the area, people tend to stick to their land. At the same time, farmers acknowledge that they cannot make a full living/livelihood out of farming alone, farming must complement other sources of income. Farmers believe that the plots are too small, and that there are too many people.

However, farmers say that farming is not optional, people need it to survive.

In Group B, members have pooled their plots into a registered trust. In Group A, everyone farms his/her own plot, but they pool income from sales into a common bank account.

Farmers hire several labourers from the surrounding villages. It is quite common, because seedlings and harvests require manpower. Labourers are paid R15 to R35 per day, depending on the task. Labourers are paid on a full day basis (07h00 to 18h00). Six to seven labourers are required for planting, which takes about 3 days for 1ha and harvesting also requires 6-7 labourers. All in all, 12-13 different persons are hired in the scheme during the year.

Both groups sell most of their produce in Mngazi. Usually, they consume what does not qualify for markets. Presently there is no market outlet on the land.

Sales are mostly to hawkers, but some sales are done at the roadside. The scheme is very accessible and visible from the main R61 road. Also, an open market supported by EC DALA is currently being organised on the other side of the road, opposite the scheme. This is considered as an improvement by the farmers.

Farmers are not interested in marketing through big contractors. In the past, some unscrupulous customers made promises (about dates or prices), but did not keep these. So farmers rely on the contacts they have established with the same hawkers, even though other markets are needed. Lack of transport is a major problem. Farmers advertise their produce at different shops in Umtata and Port St. Johns, and with hawkers.

Information circulates to farmers through the extension officer. Information days are also hosted by EC DALA, and there is training by

Department of Labour. Meetings are arranged among the farmers, and also with farmers from other schemes.

Inputs are bought with the funds available in the common bank account. Most inputs come by van from Kokstad (160kms), some from a Farmer Support Centre in Libode (6-7 km away).

### 5.3.6 Organisations

The organisations' main assets are: two farmer groups, 1 pump, 2 trusts (Group B), 2 bank accounts, 2 committees. No WUA has been established so far.

The electricity bill is sent by Eskom to Mr Mbambi (one member in Group A). It is paid from the bank account. The bill varies according to season, more in winter, less in summer. The average is about R2 000 to R3 000 a month.

Due to lack of equipment, only 8 ha can be irrigated at once (4 in group A and 4 in group B). Farmers say that "sometimes it takes 3 days to finish just one ha", due mostly to the lack of pipes and sprinklers, which have to be moved and shared between the two groups. Most of the time, there is enough water in the river, so this limitation does not refer to a limited resource. Farmers try not to all plant at the same time. Sharing water and the cost of it between groups remains a problem.

In group A, each farmer farms his/her own plot, although they decide as a group what and when to plant and they share equipment. In Group B, the committee decides what and when to plant, and everything is done collectively.

The chief plays an important role, trying to settle the problems between the two groups.

The management committees are respected and strive to settle all issues. Some conflicts are nevertheless unresolved or pending.

With regard to control of water, two committee members from each group switch the pump on and off.

After harvesting, the committee in Group B decides what is to be shared between members and what should be saved for the next planting time. This happens almost every 3 months. Members seem largely happy with the system, although income depends a lot on the last harvest. Sometimes, farmers find it difficult.

In Group A, the committee plans planting. If any farmers would wish to plant his/her own way, it would be possible. But it never happens.

Mr Mphakati was originally the leader. Now that he has gone, the two co-chairs of the committee have taken over (one per group).

Although they can farm their own plots as individuals, farmers prefer forming a group, because:

- they can sell more easily to hawkers (larger quantities),
- they have a name, they are known (visibility),
- they order inputs and seedlings together (economy of scale),
- there is security being part of a group when any individual fails or perform under par.

The private sector is not much involved. Inputs are bought in and come from Kokstad. Seedlings come from Richmond (close to Pietermaritzburg), on request. Farmers still hire tractors and implements from Mr Mphakati. Greenfoods (a vegetable store in Port St. Johns) sponsored the advertising banner along the road.

The private sector only consists of contractors (tractor and equipment) and sellers (seedlings from Kokstad, Flagstaff, Umtata, Richmond and East London).

The public sector involved consists of EC DALA (Extension, support, advice), Department of Labour (training), Local Municipality (funds) and maybe Department of Public Works.

### 5.3.7 Applying the Sustainable Livelihoods Framework

As mentioned in Chapter 3 – Methodology, a Sustainable Livelihoods Framework was used as a tool to collect qualitative data from farmers at Mngazi. A brief summary of the findings are represented here to provide a thumbnail sketch of farmers' perception of their ability to make a livelihood from their farming activities. Details of the framework itself, and an in-depth setting out of the farmers' responses are to be found in Appendices B and D respectively.

The findings are presented under headings taken from the Sustainable Livelihoods Framework. Comments from researchers are quoted verbatim, and then followed by a brief summary under each heading.:

#### Conflict

Conflicts occur between Groups A and B. It is sometimes referred to the chief or even to the police when insults are reported. Real reasons for split-up and persisting conflicts remain unknown. It's a very sensitive topic, especially from Group A view point (very offensive when it comes to this topic). It looks as if after the split-up and whatever the reason of it, a feeling of competition and jealousy grew between the groups.

Group B farmers believe that the split-up into two groups prevents any further problems and conflicts. They feel better being a smaller group. Group A farmers are very sensitive on this topic. They do not wish to discuss it.

***In summary, conflict stems from the community-based structure of the farming unit.***

#### Skills

Farmers believe they have a good background. According to them, training by the Department of Labour has been very effective. Some said they still lack skills on potato cropping.

***In summary, farmers' perceptions of their skills are somewhat superficial – what is really lacking is an appropriate understanding of farm management issues***

#### Water

Farmers find it suitable for irrigation.

There is usually enough water in the river. The problem refers more to silting. There is sand in the river and farmers find it difficult to position the pump inlet.

***In summary, availability of water is not an issue. Problems relate to on-farm management of water reticulation.***

#### Livelihoods

"For most farmers, pensions, childhood grants, remittances from migrant relatives, complement farming income. However, some depend only on the scheme."

"Farming is not optional, people need it to survive. But at the same time, they cannot make a living out of it. "Plots are too small, and farmers are too many".

"So, farming expected outcome is mostly improved income. Even food security is not really an outcome as most produces are sold. Also,

acquiring a status / reputation / recognition through farming does apply only to some few leaders. Also, farmers probably like farming.”

***In summary, farming activities are not able to provide a full livelihood. Income is often supported from outside sources, in farmers' words “plots are too small and farmers too many”.***

#### 5.4 CONCLUSION

This Chapter has provided background information and an overview of the case study schemes, as well as exploring the context frameworks in which the schemes are being analysed.

Overall, it appears that the history, and the conditions of establishment and development of both schemes differ immensely.

Zanyokwe has been established and developed on the basis of external inputs, ideas and management. Emphasis has been mostly on financial and physical capital, while social and human capital had to adapt and follow decisions and management organised by outsiders.

Conversely, the history at Mngazi shows that the scheme developed on the grounds of strong endogenous human and social capital, and consequently physical and financial capital were well taken care of.

Production features and performance of both schemes are affected by such histories; further information is provided for illustration in Chapter 6.

## 6 PRODUCTION, MARKETING AND IRRIGATION

by D Mosaka<sup>13</sup>

Vital issues in the hypothesis that the long-term viability of small scale farming schemes is influenced by the support structures surrounding the scheme, are undoubtedly production, marketing and irrigation. This chapter sets out to explore the contribution of these support structures to the success or failure of Small-scale Irrigation Schemes (SISs) and the possible influence tenure could have on the specific function.

In doing this, regard will be paid both to the insights provided by national and international literature, and to the findings of the research team in the study area, with particular regard to the selected case studies.

In this chapter, the wisdom embodied in the literature will be discussed and the situation revealed by the case studies will be dealt with. Production will be discussed in section 6.1, marketing in section 6.2 and irrigation in section 6.3. The findings stemming from these discussions will be brought together in section 6.4: Conclusions.

### 6.1 PRODUCTION

Crosby *et al* (2000), in reviewing the prospects of small-scale irrigation in the Limpopo (then Northern) Province, write:

"It is unbelievable that, with the exception of sugar projects, there are virtually no schemes that have been successful [and] the pattern of failure is so similar that it is not really necessary to undertake a needs analysis for individual projects. This similar pattern of failure is what we refer to as 'downward ratchets'".

In Crosby's analysis, the downward ratchets are evident in the "common aspects [which] are:

"Total dependence → dilapidated water supply infrastructure → ineffective water management → low production levels → little knowledge of crop production or irrigation → ineffective extension → lack of markets and credit → difficulty in sourcing inputs → expensive and ineffective mechanisation services → un-repaired fencing → damaged soils".

---

<sup>13</sup> Mosaka Associates

Crosby goes on to state that the overall micro-economic dynamic is such that piecemeal interventions with marginal benefits will most likely fail to re-launch the small-holder schemes into a significantly higher trajectory of productivity and farm incomes from where the irrigation community can take the additional costs and effort of self-management into their stride.

Based upon insights gained during the literature survey (Appendix A), the author has concluded similarly on conditions elsewhere in South Africa and Africa as a whole and found that farmers in small-scale schemes need and want support systems that go far beyond just irrigation if they are to significantly improve their livelihoods.

However, a critical issue in terms of productivity is the size of land, which is capable of providing a living for a household. Many observers focus on the high productivity of tiny holdings and this is supported by a good deal of empirical evidence. For example, a case study of the Rural Women's Association shows the value of productivity/ha to be remarkable for manually irrigated vegetable crops on 100 square meter plots. Similarly, Mpahlele et al (1999) estimate the gross margin per ha of vegetable crops to be R8 800 – R20 500/ha for tiny food plot owners, but less than R600/ha for wheat and R1 500 for maize for 2.5 ha and 5 ha farmers.

Nobody can gainsay this internationally supported negative relationship between farm size and productivity. The point is that irrigated farming income *per* household for food plot owners as well as so called commercial farmers remains too low for them to meet their subsistence requirements and generate the surplus needed for development. As a result, food plot farmers who achieve high productivity as well as 2.5 ha plot owners who do not – all 'could be classified as poor or vulnerable to poverty' with their average household income hovering around R740, the South African poverty line (Mpahlele et al 1999, p23).

The reality is that even if the productivity on the small plots is substantially better than those of the large scale commercial farmers, the net income generated on the small plots is too low to lift the small scale farmer out of his poverty level. The plot sizes in future will have to be large enough to supply an enterprising individual with sufficient income to provide a decent level of livelihood to him/her and the family.

At present, the irrigation productivity on many small-scale irrigation schemes country-wide is quite low and, in most schemes plot holders pursue low-input subsistence farming that yields a low net income per

hectare. Since holdings are very small, the net income from irrigated farming per household is also small and can only meet a small part of household livelihood needs.

In these surroundings, it is futile to expect scheme members to self-manage and self-finance the irrigation scheme since, in most cases; management transfer will leave them in greater misery.

They have been reliant on support from the start and, if the government withdraws from these schemes, a majority of the schemes will decline with plot holders turning to rain-fed farming. If small holders are somehow enabled to move up the net income/hectare curve for commercial crops to more realistic levels, upward ratchets will set in, and farmers would be willing to increase their investment in improving the quality of irrigation as is seen in sugar farming projects in KwaZulu-Natal and Mpumalanga.

In summary, then, the issue in making success of small-holder irrigation thus is not one of getting the 'process right' nor of getting laws and rights right but of devising a 'lift strategy' to replace the downward ratchets mentioned above by upward ones.

### 6.1.1 Farmer Typologies

Historically, in South Africa, small-scale farmers had been perceived as a one-dimensional entity. Holding size, for a long time has been the most common basis for classifying farmer in South Africa and previous models have followed this modality by classifying small-scale rural farmers according to holding size classes (Bembridge, 1996). It must be recognized however that this needs to be developed to take greater account of the different opportunities and constraints facing different small-scale farmers in this country, and which reflect into their strategies and practices. This can be a useful tool for strategic development policy planning.

In the data collected from the Zanyokwe scheme (Ntsono 2005) farmers are regrouped on the basis of the following criteria:

- the level of marketing (as opposed to subsistence);
- the level of diversification (number of crop sold); and
- the livelihood system (source of income). In the analysis, 5 types of farming households have been identified in Zanyokwe. Table 6.1 recaps these typologies.

These typologies were taken into account when compiling crop budgets, in order to provide the most representative cross-section of farmers and

consequently the most convincing budgets. In addition, the table gives a clear breakdown of the manner in which the land in Zanyokwe is being used. It is interesting to note that specialised farmers are producing a gross margin in excess of that of commercial farmers, and this provides a direction for possible future development of these schemes.

TABLE 6.1: TRAITS AND PERFORMANCE OF FARMING SYSTEMS IN THE ZANYOKWE SCHEME

Farmers types	Farm area (ha)	No. of farmers	Gross margin R/ha	Gross margin R/farm	Water consumption (m <sup>3</sup> /farm)	Gross margin R/m <sup>3</sup>
Non-farming plot users	3.55	18	-	-	-	-
Dry-land involved farmers	4.64	7	-368	0	0	0
Specialized Crop farmers	4.15	9	2932	4105	4236	0.69
Commercial oriented farmers (full-time)	5.61	20	2146	19134	5557	0.44
Transitional commercial oriented farmers	4.78	10	1772	11695	4917	0.32

source: Yokwe 2004; Lavigne and Stirer, 2003; Ntsono, 2005; Perret et al., 2003

NOTE: All figures are in average. The water consumption used here has taken into account rainfall, conveyance loss, bulk irrigation loss, and on-farm irrigation loss.

### 6.1.2 Crops and Crop Budgets

The following terms have been used in crop budget presented below:

$$\text{Total Revenue (TR)} = \text{Product Price} \times \text{Output.}$$

$$\text{Gross Margin (GM)} = \text{TR} - \text{Variable Production costs.}$$

Production costs include fertiliser costs, costs of tillage, costs of herbicides, transportation costs for inputs, and labour costs. gross margin does not consider implicit costs such as the opportunity costs associated with employing the resources in their current use rather than using resources in the next best alternative (meaning that some income is forgone) nor does it consider so-called fixed costs. Under fixed costs are grouped costs that are not directly allocable to a specific crop. However, the gross margin should not be seen as the net income gained at farm level, since it does not take account of further charges possibly shouldered by the farmer, such as overheads costs and external factor costs (payment of borrowed capital, hired land & rental management i.e. taxes, water fees, land fees, depreciation of capital).

TABLE 6.2: CROPS AND CROP BUDGETS

Crop	unit	Total revenue : R/ha	Producti on costs: R/ha	Gross Margin: R/ha	Water consumption: m <sup>3</sup> /ha	Gross Margin: R/m <sup>3</sup> water
Potato1	10kg/bag	3807.14	1852.84	1954.3	4470	0.44
Potato2	10kg/bag	19791.11	5865.60	13925.51	4470	3.12
Cabbage1	25kg/bag	4042.50	3116.48	926.02	2720	0.34
Cabbage2	25kg/bag	17768.33	6993.87	10774.4	2720	3.96
Carrots1	Bundle	6720	2609.28	4110.72	2660	1.55
Carrots2	Bundle	5285	1159.98	4125.02	3040	1.36
Beetroot1	Bundle	780	439.52	340.48	2640	0.13
Beetroot2	Bundle	7370	687.31	6682.69	2340	2.86
Butternut1	15kg/bag	3298.44	971.55	2326.89	3650	0.64
Butternut2	15kg/bag	12638.89	2091.87	10547.02	3650	2.89
Dry-maize	50kg/bag	6832	1329.53	5502.47	4530	1.21
Green maize	cobs	12900	2256.25	10643.75	4530	2.35

Source: Ntsono (2005)

Table 6.2 above summarises recent production activities at Zanyokwe in the selected crops. Although the schemes were generally producing at a loss during the last days of Ulimocor and some farmers are still doing so, the distribution of the total revenue across the selected crops indicates a great diversity among farmers within the scheme, with some doing fairly well and others performing poorly. The same trend is also observed in the gross margin/m<sup>3</sup> where the level of heterogeneity is quite high and varies from one crop management style to another and among the farmers within the scheme. The crop water consumption was downloaded from Sapwat for each crop and divided in to the total revenue of each crop to get gross margin/m<sup>3</sup>. Gross margin/m<sup>3</sup> in this case is not really the water productivity because not all factors like land price, management and capital were considered since the information in small-scale farmers is lacking. Gross margins/m<sup>3</sup> indicate the maximum amount that can be paid per cubic metre for water used by each crop. For example in Table 6.2 cabbage 1 (low-yield, low-costs) the gross margin is 34 cents/m<sup>3</sup> of water, and for dry maize it is R1.21 cents/m<sup>3</sup>.

### 6.1.3 Zanyokwe Production Comparison

No analysis of the production at Zanyokwe would be complete without comparing it to estimated potential production under similar production conditions. It is obviously impossible to find exactly the same climatic and soil conditions than those prevailing in Zanyokwe, however by using data from the Combud budgets for sites in the Eastern Cape it is still possible to make some comparisons with the other sites.

**TABLE 6.3: PRODUCTION COMPARISONS BETWEEN ZANYOKWE AND OTHER SITES IN THE EASTERN CAPE**

Product	Site Yield in ton/ha	Zanyokwe Yield in ton/ha
Cabbages	Gamtoos 40 tons	20.6 tons
	Sundays River 55 tons	
Potatoes	Gamtoos 13.6 tons	5.93 tons
	Sundays River 20 tons	
Butternuts	Gamtoos 15 tons	7.69 tons
	Sundays River 20 tons	

Source: - Authors' Data Survey

From the Table 6.3 it appears that the yields at Zanyokwe are far below the potential results from other sites in the Eastern Cape. The data for Zanyokwe comes from the survey done for this project and were gathered from the farmers themselves and it is necessary to make some comments about the quality of the answers supplied by the farmers. In a visit to the scheme and during an informal discussion with the farmers the question was posed to groups about the size of a specific piece of land. Remembering that a hectare is 100m x 100m, it was obvious that the farmers were overestimating the size of the specific piece of land. In gathering the data from the farmers they were also asked to give the size of the crop production area plus the yield in bags. If the specific production area was not properly measured this could contribute to the low yields. However even a 50% over estimation of the area still leaves the yields miserably low.

It must also be said that the Gamtoos and Sundays River production areas probably experience more suitable climatic conditions for vegetable production than Zanyokwe. However in the case of potato production the colder climate at Zanyokwe should contribute to better yields.

After analysing possible extenuating circumstances one still must come to the conclusion that the yields are below expected norms. The reasons for this could be due to the lack of knowledge of the farmers, wrong seed material, wrong fertilising program or any other production issue.

#### 6.1.4 Production and Tenure

It is also necessary to discuss the possible influence of tenure arrangements on the production yields. In discussions with a group of the farmers they refer often to our land and our farming and then again to my land and my farming. Probing makes it clear that there are uncertainty about the role of the community and the individual. Probing about the credit facility from Uvimba it appears as if they are very often not sure if the repayment is their individual responsibility or the group's. This confusion is probably because of the tangled web of their tenure and management arrangements. The lasting impression after the informal discussion is that a large number of the farmers want to be treated as individuals in their business arrangements. That could only become a reality if their tenure is formalised and accommodate their aspirations and make provision for proper identified plots.

As discussed in Chapter 4 freehold tenure is not the only option to attain freedom to produce the crops of your choice. Various possibilities also now exist with different levels of quitrent and leasehold options as points of departure.

## 6.2 MARKETING

Marketing is a vital factor in the successful development of small-scale irrigation farming. Such schemes should be able to serve their own immediate hinterland, and local communities should be involved in the distribution and retailing of the produce. However if the schemes become productive units the possibility arises that wider and further a field markets will have to be developed. The degree of organisation and formal structures that are required to achieve this will vary greatly from one area to another.

For example, there could be co-operative transport and marketing of produce through conventional marketing channels such as regional markets, but this requires a considerable degree of sophistication, not only in production, but also in packaging and marketing. An alternative is the formation of a linkage with exiting processors, packagers or marketers of general commodities. This could be through a citrus packinghouse, a canned fruit or vegetable installation, or a sugar mill.

This is an attractive alternative but may impinge on farmer independence.

A check-list of some key questions that need to be addressed include:

- Has the possibility of providing for the fresh produce needs of local communities been assessed?
- If this exists, can it be extended?
- What would the future potential be?
- What would the impact on the 'bakkie' trade and 'spazas' be?
- Has the potential for marketing in competition with other producers been assessed?
- Have organisations that can assist/participate been identified?
- Has the potential for co-operation with commodity groups been assessed?
- Are there niche markets or specialised products that have potential?

### 6.2.1 Marketing Infrastructure

A number of case studies have shown that effective marketing is crucial to obtaining high gross margins, with lack of markets that leads to low returns:

The local market may not always be adequate or popular because of a lack of purchasing power amongst the local community

There is a need, particularly on larger schemes, to investigate and establish marketing partnerships with traders and wholesalers, including possible processing of crops on or near the irrigation scheme.

Marketing of any new products should be thoroughly investigated.

Market prices are essential in order to determine the value of outputs from present and proposed cropping programmes.

Rehabilitation of irrigation schemes is only justified if there is an assured market. WUAs will need assistance from agricultural economists and other specialists, including processing organisations, in developing suitable marketing outlets for local produce.

Infrastructure, including access roads, telephone services and electricity are all essential requirements for marketing to function effectively.

### 6.2.2 Market Access

Access to markets and market information are items often raised by emerging farmers (small-scale commercial operations). Most successful small-scale farmers have established a variety of selling operations to reduce risk.

The opportunities afforded by mobile telephones and Internet access are beginning to be exploited in order to determine market prices and selling strategies. The need to improve quality and delivery time has been recognised and is being addressed by emerging small-scale farmers.

The literature indicates that most of the success has been due to farmers using their own initiatives although marketing assistance to emerging farmers (if they are to sell their surplus produce) will become important in the future and is probably best provided by extension officers.

In the Case Studies, access to markets varied considerably. Zanyokwe, which lacked the physical infrastructure needed for effective transport suffered in terms of market access. Roads were poor, and farmers' transport facilities almost non-existent. As a result, the Scheme was reliant on hawkers for selling their produce. Mngazi, on the other hand, was alongside the main road leading into Port St Johns, and getting produce to market was much easier. The proximity of a town such as Port St Johns also provided a ready market.

### 6.2.3 Marketing Services

Marketing refers to all those activities that facilitate the removal of produce from the farm-gate to the point of sale. Adequate attention therefore needs to be given to:

- the grading standards required and equipment needed
- the storage requirement in a particular target area i.e. associated with depots
- the opportunities for increased local marketing of produce
- the infrastructure required for local marketing i.e. roadside stalls and public markets
- opportunities for marketing outside the target area
- means of privatising market functions, in particular transport and storage arrangements
- the timeliness of payment for produced delivery into the controlled marketing system
- the legal constraints that prohibit the sale of agricultural produce within a region.

The catalyst to efficient marketing service is the extension officer working with the producers in the farming households. They are usually responsible for providing market information, facilitating the development and maintenance of infrastructure and transportation.

In the rural areas of the Eastern Cape Province, many of the rural farming community households indicate that marketing of their farm produce is a major problem for them. According to several sources that

have evaluated irrigation schemes during field investigations, many farmers were unaware of simple marketing channels after successful harvest of their crops. The lack of comprehension of the details of markets, formation of co-operatives and setting of competitive prices, credit selling/buying and profit margins means that extension-marketing specialists have not been successful in the education of farmers about rural market systems. This comment is typical of the situation, which was found in the Case Study Schemes.

#### 6.2.4 Price Comparison

The farmers at Zanyokwe and Mngazi makes an issue of the lack of proper marketing arrangements and the problems they experience in an effort to sell their products. In Table 6.4 the prices they receive at Zanyokwe are compared with the average prices at the East London fresh produce markets as published in the Department of Agriculture (2004).

**TABLE 6.4: PRICE COMPARISON BETWEEN PRICES REALISED BY PRODUCERS AT ZANYOKWE AND THE NATIONAL FRESH PRODUCE MARKETS**

Product	Market Prices <sup>1</sup> (Rand per ton)	Zanyokwe Prices <sup>2</sup> (Rand per ton)
Potatoes	R1865	R1704
Cabbages	R680	R840
Butternuts	R1183	R1062

Source: - 1 Abstract of Agricultural Statistics (2004)

2 Authors' Data Survey

It must be kept in mind that the Market price is a gross price and transport and commission must still be subtracted. With that in mind the potato and butternut prices compare quite favourable with the market prices and the cabbage is even better than the national market price. It would thus appear as if the prices attained at Zanyokwe are in balance with the local demand.

As no such detailed marketing prices were available for Mngazi no comparison was made.

An issue, which is quite clear from the above analysis, is that if production starts to increase over time more formal marketing channels will become necessary.

### 6.2.5 Marketing and Tenure

Where farming takes place in a communal arrangement it is impossible for an individual to market his own produce. The situation applies at Mngazi where the association sells all the produce and all proceeds are deposited in a common account. The surplus cash is only distributed after all accounts are paid. All though this appears to work well at Mngazi the question that crops up is: - How do you accommodate individual pride in your product? In a very competitive trading environment quality products and niche markets is the places where better prices are received. That can only be reached if the tenure system makes provision for individual production and marketing and where necessary the use of outside capital.

Co-operative marketing is an accepted norm in agricultural marketing and does serve the individual well in the period of acquiring experience. That however does not mean that the production process must also be a group activity. In a communal farming set up the marketing function will also be a group activity. A system that makes provision for individual production gives the producer the freedom of choice in his marketing arrangement. The consumer will reward those capable of delivering better quality produce.

In the final analysis it must be said that marketing channels is a result of the tenure system and other community factors in place, rather than the tenure system being a function of the marketing system.

## 6.3 IRRIGATION SYSTEMS

Irrigations systems essentially take the form of furrows carrying water from dams or weirs, or sprinklers supplied with water under pressure. The irrigation systems in the study area are made up entirely of these two.

### Sprinkler Systems

The sprinkler systems commonly used are quick-coupling and dragline sprinklers. These systems can comprise rigid pipes only, or rigid mains with flexible pipes to the sprinkler heads, facilitating positioning of the sprinklers. Some centre pivots are also found in the study area, but these are in the minority. More sophisticated and water efficient systems using drip irrigation, micro sprays or piped furrows are also available but are not present on any of the study schemes.

Most aspiring small-farmer irrigators regard sprinkler irrigation as being the norm to which they are entitled (Bembridge, 2000). The perception

is that sprinkler irrigation can be used with a minimum of land preparation, accommodates sandy soils, allowing easy control of applied water quantities and not requiring constant attention throughout the day. All that is required is to move the pipes once or twice a day!

The downside to this picture is that sprinklers are very dependent for efficient operation on maintenance of the correct pressures in the system; the capital and operating cost of pressurized schemes is a concern; motors and pumps must be maintained and there is a need for greater technical support. These costs must enable production to be at a level that provides sufficient income to be able to pay for the irrigation system and its operation and maintenance

#### Surface

In the past, the majority of small-farmer irrigation schemes were based on flood irrigation, and this is found at Qamata. Although not one of the chief case study schemes, this scheme was visited to evaluate the effectiveness of their flood irrigation system, given the overwhelming presence of sprinkler irrigation.

In areas where flood irrigation has been applied for many years farmers have learned, with experience, how much they can irrigate, what area they can irrigate under specific circumstances, and generally how to match the area irrigated to the quantity and rate of water supply.

It is nevertheless true that conventional field-scale flood irrigation requires great experience and skill if it is to be used to best advantage. However, under good management, the system does tend to become self-correcting.

Other forms of furrow irrigation include short furrows and piped furrows. These were not encountered in our case studies, but are mentioned since they deserve consideration when new schemes are being designed.

### **6.3.1 An Overview of Irrigation in SISs**

Although sprinkler irrigation is widespread amongst small-farmers, this does not indicate that it is without problems, because both the water use efficiency and maintenance can usually be improved.

One of the difficulties experienced by farmers, particularly in the communal areas, is the difficulty of obtaining skilled advice on equipment selection and design, as well as the difficulty of carrying out routine

maintenance chores, such as replacing rubber washers and worn nozzles, and repairs tend to be left until it is too late.

Sprinkler irrigation can also present a management problem when there are severe water shortages, because sprinklers are designed to distribute water over the whole area. Another problem stems from the tendency to make ad hoc changes to the system, which require it to operate outside its design parameters. A common example of this is the addition of sprinklers and/or laterals in order to cover more ground, without making any changes to pump capacity or pipelines.

A major advantage of sprinkler systems is that a farmer can start in a small way and expand the system as he learns how to use it and can afford it. If the farmer plans to do this, provision should be made at the planning stage.

It is also noteworthy that in the past the State have generally, directly or indirectly, accepted responsibility for the maintenance of systems. Despite this the schemes have failed (Bembridge, 1996).

It is important irrigation technology should in all respects be appropriate to the scheme it is serving. This is particularly important in the case of small-scale farmers and even more so in the case of emerging farmers. It has been stated before that small farmers are frequently commercial farmers operating on a small scale (i.e., they are already entrepreneurs) whilst emergent farmers are in the process of breaching the gap between subsistence farming and commercial farming. As such their operations are intensely dependent on profits, and any unnecessary costs must be avoided. It is important, then, that technology should be employed only at the lowest level necessary to produce the required results – again it should be emphasised that high-tech invariably brings with it high costs, especially where users are not necessarily sufficiently experienced.

Identifying the most appropriate technology is unfortunately not straightforward. It is dependant on the product being produced, the rate of development of technological skills by participants, the relative costs of alternative inputs, and the support of outside organisations and cash flow. Crosby (2000) has put forward the following list of considerations:

- Has consideration been given to phased applicable appropriate technology?
- What is the water supplies infrastructure?
- What crops will be produced, and in what quantities?
- What training initiatives will be required, and are they available?

- What technical support facilities will have to be provided?
- Irrigation methods?

Additionally in pumping schemes, the state of pumps and motors, as well as in-field sprinkler equipment needs to be carefully assessed and costs obtained from engineers and dealers. The choice of technology is influenced by manageability, labour requirements, size of plot and distance from the field

Costs are of course important. Gravity fed schemes generally has much lower running costs than pumping schemes. The most economic delivery system, including adequacy of pump stations, needs to be investigated, before any decisions on technology can take place.

The above arguments are predicated upon the assumption that pressure irrigation with sprinklers is to be used. However, proper thought should be given to the possibility of using furrow irrigation in one of its guises before too much thought is given to more expensive systems, unless they can be properly justified.

### 6.3.2 Irrigation Systems in Place in the Study Area

In 1998 there were some 50 SISs established in the Eastern Cape. Irrigation methods vary somewhat between the schemes, but there is an overwhelming preponderance of sprinkler systems, sometimes combined with draglines. There are isolated instances of draglines alone, furrow systems, and centre pivots.

Table 6.5 below shows the percentage use of the various types and combinations mentioned

**TABLE 6.5: INCIDENCE OF USE OF DIFFERENT TYPES OF IRRIGATION SYSTEMS**

Method of Irrigation	Incidence
sprinkler	39%
sprinkler/dragline	39%
dragline	7%
flood	9%
flood/sprinkler	2%
centre pivot	2%
centre pivot/sprinkler	2%
	100%

Source: Research Team

It will be seen that sprinklers and draglines, or combinations of the two, constitute some 85% of the irrigation systems in use. It is also noteworthy that only some 10% of the systems are flood irrigation.

TABLE 6.6: IRRIGATION SYSTEMS USED IN SHORT-LISTED CASE STUDY SCHEMES

Scheme Name	Irrigation system
Horseshoe	Electric pump, pipes, sprinklers
<b>Zanyokwe</b>	<b>Electric pump, pipes, sprinklers</b>
Keiskammahok	Gravity, pipes, sprinklers
<b>Mngazi</b>	<b>Electric pump, pipes, sprinklers</b>
Zikolwethu	Electric pump, pipes, sprinklers
Vukani-Mathole	Diesel pump, pipes, sprinklers

Source: Research Team

It has been mentioned elsewhere in this report that the short-list of schemes selected for the case-study show a rich diversity in all of the important areas, except irrigation. As will be seen from Table 6.6, all of the schemes use pipes and sprinklers, with either gravity feed or diesel/electric pumps. The two schemes ultimately chosen as case studies (shown in bold type in the table) have identical irrigation systems.

This lack of diversity has meant that it has not been possible to have a detailed insight into the contribution, which different irrigation systems might have made to the long-term viability of the case study schemes. The discussion has therefore concentrated on how effective the sprinkler systems have been, and what impact costs and maintenance problems have had.

#### 6.3.2.1 Discussion

Bembridge (2000) has said that most aspiring small-farmer irrigators regard sprinkler irrigation as being the norm to which they are entitled. Amongst the short-listed schemes it is true that the preponderance of irrigation is by sprinklers in various forms. However, it was interesting to

see that Qamata had a functional furrow system, although there was a faction of farmers who believed that a centre-pivot was the way to go.

At Zanyokwe farmers use sprinkler irrigation systems, where the sprinklers are directly connected to the lateral pipes of the system. The system is old and very labour intensive, as the laterals with their sprinklers have to be shifted every time a move is made to irrigate an adjacent area.

At Mngazi the irrigation was by sprinkler, but here the sprinklers are connected to the laterals with flexible pipes so that individual sprinklers can be more easily moved and a greater area can be covered before the laterals themselves need to be moved. As the scheme was started in 2000 the equipment is still new and in good condition. It is well looked after and provision is made to be able to readily move the main pump in times of flood. As reported in Section 3, the history of Mngazi, the major change has been irrigation infrastructures. This irrigation system certainly represents a considerable advance on the watering-can system, which was initially used by Mr Mphakati.

#### 6.3.2.2 Findings and Implications

In considering various issues surrounding the irrigation systems at Zanyokwe and Mngazi, it needs to be born in mind that the schemes have very different histories. Specifically, Mngazi is a new scheme a few years of age, whilst Zanyokwe is a scheme of long standing. Problems brought on by aging of equipment and long-term neglect have not yet had an opportunity to become manifest at Mngazi. Furthermore, the chequered history of Zanyokwe has provided a fertile environment for disillusionment to set in, and this could also colour the attitude of farmers to their irrigation equipment.

##### Effectiveness

Subject to the comment made above, it has to be admitted that the irrigation schemes in both Zanyokwe and Mngazi are doing their jobs of providing irrigation. However, at Zanyokwe the ravages of time are apparent and it needs to be queried how long this can continue without intensive maintenance and some refurbishment.

At Mngazi, with newer equipment equipped with flexible laterals (making the labour of moving sprinklers less arduous) and new pumps, farmers are not yet voicing objections to their system. Cost comparisons currently being carried out should indicate whether they are likely to run into trouble later due to inadequate maintenance.

At Qamata there is a furrow system in good repair (it was undergoing maintenance when the research team visited the scheme in July 2003) and it is claimed by one faction of farmers that it is doing a good job. However, as mentioned above, there is still a faction that advocates the use of a centre-pivot. In the light of the expense, maintenance requirements and management problems of a centre-pivot on small farming enterprises, this is an aspiration, which is difficult to appreciate.

Capital costs of irrigation schemes are considerable, and can contribute substantially to the ability of small farmers to remain viable. A brief comparison of current capital costs (Authors' survey) of irrigation systems is:

- furrow – R 700 /ha
- sprinkler/dragline – R8 500/ha
- centre pivot – R12 500/ha
- drip – R18 000/ha

#### Technology

Conventional sprinkler systems seem to set the standard in this respect, although it would be interesting to see why furrow irrigation has not been more used. A move towards technically intensive and expensive centre-pivots is, under the circumstances, difficult to understand.

### **6.3.3 Most Appropriate Technology**

It is believed by the research team that the focus for irrigation systems should be one of "appropriate technology".

Schemes developed during the late 1950s and 1960s tended to follow this philosophy in that they would employ a relatively inexpensive design using furrows to convey water from a weir or a dam.

However, most aspiring small-farmer irrigators now regard sprinkler irrigation as being the norm to which they are entitled (Bembridge, 2000), and aspirations of farmers tend to be for even higher levels of technology, possible in the belief that it will reduce labour requirements without introducing any other problems.

The literature details other systems such as short furrows and piped furrows, which were not encountered in this research, but could surely warrant consideration in designing a framework for future implementation of SISs.

However, whatever level of irrigation technology is employed, it is essential that the farmers be adequately trained in the operation of the

equipment, its need for maintenance, and in the methods of maintenance.

#### 6.3.4 Irrigation and Tenure

There is not all ways a link between tenure and irrigation systems, but in cases where during the planning process a decision to install a centre pivot is taken individual decisions on production is eliminated. The system can thus dictate or influence the tenure option.

It is also necessary to distinguish between the bulk water supply system and the on the land irrigation system. In all SIS the bulk water supply system is shared by the farmers and is there for a group responsibility. That does not necessarily apply for the on land system, where a group or individual approach is possible. In is thus possible that a choice about tenure can determine the irrigation technology installed. It is there for necessary that in the planning process of the irrigation system provision is made for the individual's position. If he or she only wants to be part of the bulk water supply system and not part of a group farming enterprise the system must be in a position to accommodate the individual.

At Zanyokwe and Mngazi the present equipment in place make it possible that it can be used in a communal or individual farming system.

#### 6.4 CONCLUSIONS

The Zanyokwe Irrigation Scheme at Keiskammahoek and the Mngazi Irrigation Scheme at Port St Johns present two interesting contrasts. Zanyokwe is old, beset with problems, has poor access to markets and is unsuccessful. Mngazi is new, functions fairly well, has easy access to markets and is relatively successful, despite the fact that the farms are still not able to provide the farmers with sufficient income.

As discussed in the appropriate sections, one of the most pressing problems at both Zanyokwe and Mngazi is at present to increase production to acceptable levels. Improving the managerial and production competence of the farmers can achieve this. However it is also necessary at Zanyokwe to get the farmers to accept responsibility for their decisions, one avenue would be to sort out the tenure tangled web, demarcate the plots and encourage entrepreneurial skills by encouraging individual farming units. Taking the present situation in consideration Zanyokwe would probably be one of the sites where a range of tenure options is possible to accommodate all the different aspirations. If production at Zanyokwe starts to increase the specific

locality would dictate when and how formal co-operative marketing channels must be developed.

At Mngazi it appears as if the present leadership are acting responsible and has the support of the farmers. However they would over time have to address the question of outside finance, individual development and ambitions and more formal marketing structures. The present communal farming practised dictates a group marketing structure and if production increases more formal marketing channels will have to be developed.

From the above discussion it is clear that production, marketing and irrigation technology is inter linked and also effected by tenure arrangements. Proper application of irrigation technology will improve production; increased production will affect marketing. Tenure arrangements can effect the selection of irrigation technology while vice versa irrigation technology can influence the tenure option.

It is there for clear that the tenure options and their implications must be sorted out up front before any decision on technology or marketing is taken.

It is now also necessary to allocate values in the matrix to value the influence that production; marketing and irrigation have on the other identified factors.

### **Production**

- Production on tenure – no influence and a 0 allocated
- Production on marketing – the produce variety will have a considerable influence on marketing and a 2 is awarded.
- Production on irrigation – the type of production cycle or crop could influence the irrigation system and a 1 is awarded.
- Production on financing – the profitability of the proposed crop can influence the availability of finance and a 1 is awarded.
- Production on institutional – no direct influence could be identified and a 0 was allocated.
- Production on social – although the influence would not be large but the production of profitable crops can be of influence on the social structure of the community and a 1 is allocated.

A total of 5 were awarded for the influence of production on the other factors.

### **Marketing**

- Marketing on land tenure – no direct influence could be identified and a 0 is awarded.

- Marketing on production – the availability of markets can influence production and a 1 is awarded.
- Marketing on irrigation – no direct influence of marketing on irrigation could be identified and a 0 is awarded.
- Marketing on finance – the availability of markets can influence finance and a 1 is allocated.
- Marketing on institutional – the availability of markets can influence the organisational and management arrangements of the SIS and a 1 is awarded.
- Marketing on social – no influence from marketing on social was identified and a 0 was allocated.

A total of 3 were awarded for the influence of marketing on the other factors

### Irrigation

- Irrigation on land tenure – if a decision about an irrigation system is taken before the decision on tenure it could influence the decision and a 1 is allocated.
- Irrigation on production – the irrigation system in place could play a huge role in the decision on which crops to produce and a 3 is awarded.
- Irrigation on marketing – irrigation plays no role in marketing and a 0 is awarded.
- Irrigation on financing – no influence by irrigation on financing could be identified and a 0 is awarded.
- Irrigation on institutional – the irrigation system installed will effect the organisational and management arrangements and a 1 is awarded.
- Irrigation on social – no influence was identified and a 0 was awarded.

A total of 5 were awarded out of a maximum of 18 for the influence of marketing and irrigation systems on the other factors, which indicates a relative low overall influence

All though these issues are important they appear to play a lesser role in the success or not of a SIS.

**FIGURE 6.1: PRODUCTION, MARKETING AND IRRIGATION MATRIX**

	land tenure	production	marketing	irrigation	financing	institutional	social	all	definitions
land tenure	-	-	-	-	-	-	-	-	freehold, quitrent, communal, trust, leased
production	0	0	2	1	1	0	1	5	quantity and quality of output, crop selection
marketing	0	1	0	0	1	1	0	3	effectiveness in reaching markets
irrigation	1	3	0	0	0	1	0	5	adequate water, appropriate irrigation systems
financing	-	-	-	-	-	-	-	-	access to, and effective management of, finance
institutional	-	-	-	-	-	-	-	-	WUAs, CMAs, CPAs, Acts, management
social	-	-	-	-	-	-	-	-	Community attitudes, skills bases, level of training
all	-	-	-	-	-	-	-	-	

NOTE: All impacts are row upon column

## 7 FINANCING

by CJ Williams<sup>14</sup>

The literature is insistent upon the need for small-scale farmers to have access to and to be able to service finance. It was, however, found that whilst effective financing arrangements are essential elements of a successful SIS, they alone do not dictate the ultimate viability of a scheme. Issues such as land tenure and availability of markets, for example, play an equally critical role, as has been discussed previously. Furthermore, other issues which were not originally specifically highlighted as critical, such as adequate training and farmers' attitudes towards commercial farming were found to play an important role in the long-term viability of SISs.

### 7.1 A HISTORICAL PERSPECTIVE

Providing credit and finance to emerging farmers has ever been a major issue in most developing countries. According to Bembridge (1985), "the lack of credit and available finance provided to the farmer at the right time may constitute a constraint to development".

The absence of credit, input and output markets is a constantly recurring theme in the literature. Shah *et al* (2000) say that "another major constraint that African small-scale schemes face is the difficulty of accessing credit, inputs and output marketing facilities. Most small-scale farmer schemes are located in remote areas away from towns and cities with which they often have poor linkages. In the previous regime, output marketing and input supply were centralised. Such markets as existed previously gradually disappeared. As a result, today, on many schemes, the most binding constraint on making small holder schemes viable is the absence of credit, input and markets". The emphasis on inputs and markets as well as credit availability is noteworthy. In the same vein, Backeberg and Groenewald (1995) comment "irrigation development was delayed considerably due to shortages of operating and fixed capital. Given the capital intensity of irrigation farming and the risk of too high loan financing, lack of available equity capital as a source of financing limited successful entry into farming". In this respect it must also be borne in mind that irrigation schemes in particular frequently involve high-cost systems which if not used to their best advantage can

---

<sup>14</sup> Economic Project Evaluation (Pty) Ltd

result in high levels of indebtedness. Maintenance costs can also be prohibitive.

The recent history of rural and small farmer finance in South Africa can best be summarised by the work of the Commission of Inquiry into Rural Financial Services, better known as the Strauss Commission (Strauss Commission, (1996). This Commission was active in 1995 and 1996.

The Commission considered the major policy objectives of government and its brief to contribute towards increasing access to financial services for rural people. These services were identified as transmission services, savings products and loan products for consumption smoothing and productive loans (for "on-farm" and "off-farm" activities). The Commission also identified that state grants would be necessary under certain circumstances, and called for a detailed set of guidelines on the management of subsidies and grants, including their phasing out.

A role was identified for the state to facilitate as well as co-ordinate the provision of financial services (with special attention to the needs of women). In this regard the Commission proposed that the Land Bank be tasked to fulfil this role. It was argued that the way in which the Land Bank, the state and other institutions act must be in support of the market. At the same time the inherent weaknesses in the existing institutional fabric should be acknowledged, as these institutions are not able to contribute to the aims of rural reconstruction on a national basis without appropriate and active support.

In essence, the, the Strauss Commission considered the reality of the rural areas of South Africa, the demand for financial services and the current institutional structure. Against a set of guidelines, it also made a number of recommendations directed at different problems.

Perhaps one of the major emphases by the Commission has been the rejection of a supply-driven system of rural credit, thus rejecting subsidised interest rates and state-driven credit programmes.

An important part of the historical fabric relating to finance provision for small-scale farmers is provided by the Development Bank of Southern Africa (DBSA). In South Africa prior to 1994, small-scale farmers especially in the former homelands had access to credit and loan facilities, and government-approved institutions such as the DBSA were able to finance groups of farmers with full government participation in the project. However, experiences with respect to loan repayment, especially from resource-poor farmers, was not good and brought about changes in lending policies (Thomas and Stilwell, 1994).

The DBSA has also been involved in supporting efforts by providing guidelines for establishing Farmer Support Organisations. Writing about these guidelines, Van Rooyen *et al* (1987) cite, *inter alia*, two principles, *viz.*:

- Purely commercial ventures should enjoy equal investment opportunities throughout Southern Africa, with comparable access to financial resources.
- The access to farmers in Southern Africa should be on an equal basis.

It needs to be recognised that promotion of developing farmers may require substantial support, protection and incentives, especially during the initial phase of development. Guidelines drawn up by the DBSA would in principle consider partially financing some or all of the financial (input, capital, etc) requirements of a specific farmer support programme.

The implications of the above discussion are that institutions such as the Land Bank, the DBSA and similar parastatals have been looked to to provide financing for small farmers, with the emphasis moving away from subsidies. However, Coetzee and Cross (2002) estimate that less than 1% of the portfolio of the Land Bank is for small farmer financing (less than R10 000).

Commercial Banks also have a role to play in providing small-scale farmer finance. They would, however, be interested in supporting creditworthy projects and individuals, and these ideals are not readily achieved in the field of emerging farmers. These banks would be reluctant to lend money where there is uncertainty about reaping appropriate returns on the project. Increased tenure security and long term leases may facilitate farmers' access to credit, but banks would not be willing to accept title as collateral unless the land is saleable.

## 7.2 CURRENT APPROACHES TO PROVISION OF FINANCE

### 7.2.1 Land Bank

Coetzee and Cross (2002) comment "the Land Bank has largely reformed itself in terms of its political positioning. However, the Bank's systems and products, as well as clarity on mandate, have not materialised as clearly. In the micro-finance arena the Bank managed to launch their Set-up product successfully in April 1998. At the moment they are approaching 43 000 clients and the repayment level is around 80%. The product is being handled by the Start-up group in Cape Town and the payments and accounts system is handled by First National Bank and the Postbank. The intention is to expand this product. It starts

at R250 loans and the ceiling of the last repeat level has recently been increased to R20 000. The mere fact that the Land Bank is entrusting this product to an agent indicates its approach to co-operation and its use of third parties. They lack a service structure, since they have only 25 branches. These branches service their biggest sources, namely individual farmers and co-operatives. The Land Bank does extend loans to emerging commercial farmers in their "bronze range" of products (maximum R50 000).

Members of the project team to assess their activity in the Eastern Cape interviewed the Land Bank in East London. They were asked about their experiences in providing finance for emerging farmers. The response was that since 1997/8 the bank has approved approximately 600 loans from small irrigation farmers. However, 65% of these loans were not repaid promptly and many farmers defaulted. It was stated that ever since these developments the bank has adopted a much stricter approach and currently many loan applications are being rejected.

The feeling was expressed that it is too risky to do business with small-scale farmers due to the lack of expertise and training amongst prospective farmers, and lack of proper physical infrastructure.

Nevertheless, the Bank services emerging farmers, even when they are farming on communal land. Bank policy allows loans of up to R25 000 to be granted, and the money can be used for purchase of inputs and purchase of land. These loans are granted on a 10% fixed interest rate for 2 years, although for previously disadvantaged individuals and for certain categories of loans there are different interest rate ceilings.

The Bank is facing competition from the commercial banks, which are also making inroads into the agricultural sector. There is a feeling that the commercial banks are luring the most creditworthy customers away from the Land Bank (cherry picking) and they are also able to offer other products such as savings and current accounts.

### **7.2.2 Uvimba**

A credit and saving mobilisation programme is currently being run in Eastern Cape by Uvimba, which was formed to replace the closed former Ciskei and Transkei Agricultural Banks. It has been successful in serving a number of credit groups (including woman based groups) in both rural and urban communities, and has been delivering credit and promoting savings since 1998. Although it covers a wide range of micro-lending activities, it is active in the arena of small-scale farmer financing.

Discussions were held with officials of the Uvimba Development Bank in King Williams Town mainly to determine their attitude towards the loans they were administering for the Zanyokwe Scheme. During this discussion, the issues raised by the farmers at Zanyokwe were taken up.

Officials were asked about the rate at which some farmers default on their loan repayments and what the consequences of defaulting are, given the burden of the debts they have inherited in the past. The response was that the rate of default is not very high and that most farmers try their best to pay off their loans. However, in the event of farmers not honouring their obligations in this regard, the legal route would definitely be considered. It was also acknowledged that some of the farmers shoulder the burden of the debt inherited in the past, and efforts were being made to have debt inherited under the previous regime liquidated.

The team also asked them for views on the fact that the farmers consider the 10% interest rate as too high. The Bank indicated that it considered the 10% interest rate to be generous and indicated that the farmers were a bit spoilt. The implication was that most of them, after generating income, do not think of paying off their loans promptly, but rather consider spending their income for other purposes like paying for university fees for their children, and then, after exhausting all their income, they claim that they are not able to repay their loans.

Asked for an opinion as to why there was such apathy at Zanyokwe and other schemes they may be financing, the Bank responded that their feeling was that:

- the farmers are spoilt and not determined to work hard. They cited the dependency syndrome as their main problem. This is attributed to farmers being heavily dependent, as in the past they had everything done on their behalf by middlemen and parastatals such as Ulimocor.
- the Zanyokwe Development Trust lacks capacity and required skills and support structures. It was felt that the Department of Agriculture should play an active role in capacity building and be instrumental in addressing the plight of the farmers.

As well as the two formal credit providers catering for emergent farmers discussed above, the history of the schemes in the area point to financial support having been obtained from various parastatals as well as government and local government. These include Eskom, Department of Public Works, Department of Water Affairs and Forestry, Eastern

Cape Department of Agriculture and Department of Labour, to name some of them.

### 7.2.3 Private Sector

It is clear that commercial banks are interested in moving into the small loans market, and with that in mind the management of commercial banks was approached to determine their interest in financing emerging small farmers.

In these meetings, the following questions were used to guide the discussion:

- Does land tenure influence the ability of commercial banks to access finance?
- Is there a niche developing vis-à-vis financing emerging farmers, given that the Land Bank is being steered towards commercialisation?
- Is there a model, which would allow commercial banks to participate in this market?

In response to the first question, it was clear that the overweening issues as far as the banks were concerned were risk management and land rights. The banks conduct their business in line with well-founded notions of risk. This essentially means that loans should be covered by collateral. In the case of farming, this would need to take the form of land over which the applicant had a suitable right of ownership, or use. Thus the form of land tenure under which the land is being used becomes all-important. Where land is communal or in any way jointly owned, it is difficult to establish the applicant's right to the land if it is to be used for collateral purposes. Land tenure, then, is a definite stumbling block in terms of accessing finance from the banks where the individual right of ownership or use over the land is not clearly established, as is the case with communal or tribal land.

In considering the second question, a clear distinction was drawn between development financing, which inherently involved a high risk, and commercial financing. It was felt that the Land Bank, which had been instituted in order to assist agricultural development, should continue to do so, and that commercial banks would continue to service the market, which conformed to their notions of risk. The commercial banks saw no problem with assisting with financing emerging farmers, but only subject to keeping the business within their risk profiles.

In terms of there being a model under which commercial banks could become involved in financing emergent farmers, there was really only

one comment, and that was "land rights". Only when finance seekers could demonstrate appropriate land rights could the banks begin to show interest.

#### **7.2.4 Summary of the Current Situation**

Discussions with credit providers (such as the Land Bank and Uvimba) have indicated that sources of credit for small-scale farmers are available through formal channels, and these sources are being used in our study area. In considering this situation, however, the difference between small-scale commercial farmers and emerging farmers must be kept in mind. Small-scale commercial farmers, whilst small in size and output are nevertheless commercial enterprises, committed to an entrepreneurial approach to wealth creation through farming. Emergent farmers, on the other hand hover on the brink between subsistence farming and commercial farming. As a result there is frequently a lack of motivation to move from being a food provider or a hired hand to accepting the challenges that managing a commercial enterprise entails. Partly due to this, and partly due to the hardships of establishing a viable enterprise under unfavourable conditions, emergent farmers' records of loan repayment are not encouraging. This is leading to a hardening of policy on the part of formal credit organisations such as Uvimba and the Land Bank, leading in turn to even greater difficulties for existing and new emerging farmers to access credit.

Other sources of credit, such as commercial banks are moving into the area of small-scale farmer financing, as borne out by the comments of the Land Bank, but these organisations are accustomed to dealing with commercial enterprises, and it is likely to be some time before they will be prepared to accept the risk of financing emergent farmers.

Finally, it is undoubtedly true that loan repayments can only be made from profits, and there are many factors other than access to credit that influence the ability of an emerging enterprise to generate profits, as discussed in previous Chapters.

### **7.3 FINANCING SYSTEMS IN PLACE, AND FARMERS' PERCEPTIONS**

Of the 50 or so small irrigation schemes established in the Eastern Cape, there are a great variety of sources of finance evident. To give a sample of some of these, Table 7.1 lists the financing arrangements for some of the schemes, which were short-listed for case study purposes.

FIGURE 7.1: SOURCES OF FINANCE FOR SIS

Scheme Name	Sources of Finance
Horseshoe	Land Bank loan to CPA
Zanyokwe	Loans through the Trust by Uvimba; supported by PWD, DWAF, EC-DA
Keiskammahoek	Individual loans; DC-DA, PWD, Eskom, Land Bank, Dept Labour, DWAF, etc
Mngazi	Supported by EC-DA
Zikolwethu	Individual loans; Land Bank and Uvimba
Vukani-Mathole	No loans, no debts; supported by AngloGold, EC-DA

Source: Survey by Project Team

Key players are the Land Bank and Uvimba, together with support from various government and parastatals organisation. The discussion, which follows focuses on the two schemes, which were chosen for case studies, viz. Zanyokwe and Mngazi. These schemes obtained finance through Uvimba and the Eastern Cape Department of Agriculture. In both cases opinions were sought from both the farmers and the finance providers, and their sometimes-divergent views are discussed below.

### 7.3.1 Zanyokwe

This scheme has 534 ha of irrigated land, of which very little is currently being farmed. The main cash crop farmed is cabbage, with potatoes, butternut, carrots and beetroot being the preferred alternatives.

The present situation is characterised by apathy and neglect. Much of the irrigation system, plus some other equipment (i.e. an expensive potato-sorting conveyor) is in a state of disuse. Farmers perceive that major constraints to progress include a lack of machinery and tractors, poor access roads, high input costs and limited marketing.

The Uvimba Bank (which provides much of the finance to farmers in this scheme) is of the opinion that the farmers are spoilt and are not determined to work. The bank believes that the main problem is the

"dependency syndrome" as a result of these farmers having been heavily dependent on middlemen and Ulimcor in the past.

This scheme was the initiative of the former Ciskei homeland in 1983. The establishment of the scheme was motivated by an endeavour to alleviate poverty and to achieve development objectives that would provide people with a stable livelihood as part of a ten-point plan initiated by the former Ciskei homeland. The scheme was established by an Israeli concern that was commissioned by the then Ciskei homeland. As well as establishing the scheme, the role of the Israelis was also to implement capacity building and training with regard to farming and farming practices in the communities. After the Israelis had fulfilled their mandate, they left the schemes in a viable condition in the hands of Ulimcor. Major problems, concerned with the management of the scheme by Ulimcor, surfaced immediately. As a result of these problems, the farmers began to quit and the scheme started to collapse. The current Eastern Cape Government, in an endeavour to revitalize the scheme, made a sum of R900 000 available. According to the farmers, from this amount, which is administered by Uvimba Bank, a sum of R10 000 was given to individual farmers to resume farming activities.

This does not appear to have had any positive results, and as mentioned above, the prevailing mood is one of apathy and gloom.

Interviews held with farmers involved in actual farming activities revealed their perception of major constraints to further progress to be lack of adequate finance, machinery, tractors, high input costs, lack of physical infrastructure (no access roads) and marketing.

In Zanyokwe the principal issue was the R900 000 made available to re-establish small-scale farmers, and which was distributed amongst them in packets of R10 000. These amounts were made available at an interest rate of 10% and the Zanyokwe Development Trust made recommendations for their allocation to Uvimba Bank, which disbursed the loans accordingly. Initially this amount was meant to be a grant, but to avoid a "dependency syndrome" (where farmers accustomed to the role of a middle man become unable do things for themselves) and lack of discipline, it was decided to make it a soft loan.

The research team asked the farmers at Zanyokwe as to how do they regard the current *status quo*. In response they stated that the R10 000 amount is inadequate and that the 10% interest rate charged on this loan was too high for them. They highlighted their belief that in most cases the farmers are not in a position to repay the loan and in some instances

they have to borrow money from micro lenders and loan sharks to repay the loan from Uvimba Bank. This resulted in further exacerbating their level of indebtedness.

### 7.3.2 Mngazi

The Mngazi Scheme was established in 2000. In contrast to Zanyokwe, farmers at Mngazi are more successful, despite the fact that only 6 of the available 26-hectare area are under irrigation.

Here, cabbage and spinach are the most popular crops. In 2002, farmers were able to generate a gross income of R114 000 from the sale of 100 000 cabbages. In addition, farmers are now trying new crops such as onions, carrots, potatoes and butternut – all crops that command a relatively high price in the market.

The current impression is of a flourishing scheme that is productive, economically viable and well supported by the local political and commercial environment. Now that farming has proved to be profitable, people tend to stick to their land and even some youngsters have started to farm in this scheme. However, it must be acknowledged that farmers cannot make a complete living from farming – most farmers in this scheme rely on other sources of income (e.g. pensions, labour, etc.) – as plots are perceived to be too small and there are “too many farmers”.

Possibly the most important contributor to the success of this scheme is the fact that it is very close to the R61 road. This means that hawkers are easily able to reach the farmers to buy their produce. This is a very significant factor as these farmers do not have their own transport and are reliant on the hawkers using their own transport to reach the farms. Scheme farmers are also able to sell some of their crops from a roadside stall they have built. This relatively easy access to markets/customers tends to support the contention made in the literature that market access may be the most significant factor in determining the success or failure of a small-scale irrigation-farming scheme.

Scheme members do not own any big farming equipment. This has to be hired from contractors, some of whom are not reliable, which can affect planting and harvesting. However, the supportive infrastructure (i.e. Extension Officers, easy access to markets, a nearby seed plant nursery, training, finance, etc.) has contributed to the success of the Mngazi scheme. In addition, the fact that this scheme is relatively new and, therefore, is not hampered by “baggage” from the past (e.g. debts,

old, non-functional equipment, etc.) has also contributed to its relative success.

At Mngazi the main providers of finance have been the local municipality and Uvimba Bank, as well as NCASA (the National Cooperatives Association of South Africa). The Uvimba Bank has lent the farmers R30 000, using a subsidiary of Absa bank (the Meet bank) as a repayment channel.

During discussions with the mayor of Port St Johns it was indicated that the local municipality has earmarked an amount of approximately R2million for the support of emerging farmers. This budget is mainly to assist the farmers with input costs and management expenses. There was some feeling of commitment behind this action, since the Mngazi scheme is seen as part of an Agro-tourism initiative in the area.

It was indicated that the Mngazi irrigation scheme is a registered Section 21 company and this has also made it much easier for them to attract finance especially from NCASA.

It is thus evident that the Mngazi farmers are at all times surrounded by a well-developed and functioning support system. This is a common thread which ran through financing, extension support, training and external services. Notable was a seed-plant nursery financed by NGOs which provided seed plants to the farmers.

#### **7.4 DISCUSSION**

Having examined the situation surrounding the provision of finance to SIS farmers, particularly as regards the two case study areas, the interactions between finance, land tenure and other sub-systems, which form part of the environment of SISs, will now be investigated.

##### **7.4.1 Land Tenure**

Up till now the private commercial financial sector has not been very active in providing finance to the small emerging farmer sector. Although many reasons are put forward to explain this situation, this Section will concentrate on the possible linkage between land tenure systems and financing.

One of the reasons put forward by commentators is the absence of security/surety of funds provided to the communal farmer. In South Africa, as previously explained, the perception has developed that freehold is the only tenure system that make it possible for a provider of financial assistance to recoup the money if the lender fails to repay the

loans. In other words, the value of freehold land has acquired an intrinsic value and could therefore act as guarantee for any outstanding loans: Over time a system has developed where not only the land was bonded, but also the crops grown upon the land.

The result of this was that in the case of default by the farmer he/she not only lost the use of the land, but also his/her homestead. All the role players in the so-called commercial areas accepted this. This however is not acceptable in the communal areas where the use of cultivated land is for the individual but grazing is shared and the person's right to his house is nearly sacred.

Up till now only the government institutions have been prepared to invest in communal land and it will be a challenge to all role players to find an acceptable solution to overcome these problems. On the one hand the security of tenure issues around community ties must be addressed, and on the other, ways must be found to ensure that private institutions still have a reasonable chance of recouping their money in case of default.

This issue has been spotlighted again with the Government's statement of their intention to transfer up to 30% of presently white owned land to black farmers. If this intention also includes 30% of irrigation land, huge strain will be put on the government's capabilities and resources, if they are to remain the main provider of finance. Where irrigation schemes are to be acquired by groups that intend to farm the irrigation land, government organisations will have to provide finance, or the land tenure arrangements will have to be such as to meet the requirements of commercial finance providers.

It should however not be impossible to overcome it if the right to home/house and the right to use of the irrigation land can be separated in a tenure arrangement. If there is a clear usage right of the land, and a clearly defined body in whom this right of usage is vested, then commercial service providers should be prepared to become involved.

#### **7.4.2 Finance**

Here we find a clear divergence between the perceptions of the bank and the farmers. The Uvimba Development Bank feels that farmers are not managing loans responsibly and that they need training, whilst the farmers feel that they have both the necessary skills and training. Each appears to be adopting a self-protecting attitude and there is a great need for common ground to be developed before such issues can be settled.

It would seem that the Land Bank is much closer to the needs of emergent farmers than Uvimba but it is clear that they are feeling pressure from the Commercial Banks, whilst at the same time being driven into a more open market mode. This has resulted in their increasing caution in taking on risk in the form of emergent farmers.

#### 7.4.3 Training

Although many of the farmers claimed that they were sufficiently well trained, there were clear indications that greater support and capacity building would improve the viability of the schemes.

Farmers at Zanyokwe were questioned about the need for training and capacity building. It was indicated that under the previous regime when the parastatals were still in charge 90% of farmers received adequate training and 10% of the farmer still remained untrained. The finance providers, on the other hand, were quick to underline the need for training of farmers, particularly in financial management.

The Land Bank was asked what measures they could take or what role they could play in assisting with building the capacity of the farmers on the issue of financial management. The response was that the Bank can do this, but it would necessitate the creation of another and unique department. Uvimba felt that it was not part of their remit to provide such training to their customers.

At Mngazi, asked about the need for training and capacity building for the farmers, it was indicated that the local municipality has enlisted the services of BLT as a service provider to train the farmers in all critical areas of farming. They further indicated that this initiative is in line with the National Skills Development Strategy's introduction of SETAs. The Tsolo Agricultural College is also active in this regard.

#### 7.4.4 Institutional

Recognising that institutional and organisational arrangements were having a marked impact on the viability of the schemes visited, although not always directly connected with the provision of finance, some of the arrangements in place were examined more closely.

Asked about the effectiveness of extension officers, members of the farming community at Zanyokwe provided the following comments:

- The extension officers employed under Ulimocor regime introduced their own policies, which ushered in an era of anarchy.

- The extension officers trained local farmers with the intention that farmers should work for them. This resulted in an employer-employee relationship instead of an extension officer-farmer relationship.
- The extension officers took loans on behalf of "farmers" from the Ciskei Agricultural Bank without their consent and used those funds for their own purposes. This led to the debt trap situation the farmers found themselves in.

At Mngazi It was indicated that in total six extension officers preside over the area which comprises 17 wards, and that they were understaffed at present. The Mngazi irrigation scheme was initially a group scheme where actual farmers work on the land themselves, which implies that they did not incur the costs of hiring labour. During data gathering exercises, however, it became clear that farmers do in fact hire labour from nearby communities. This added to the negative impacts on profits. In addition the scheme's demographics are quite unique, as it comprises both young and old people. However, the elder farmers indicated that it is not easy to work with young people, as immediately after harvests and sale of produce they demand their share of the profits. However, the farmers are being trained and advised on bookkeeping, banking, and courses on Conflict Management are also offered to them.

## 7.5 CONCLUSIONS

As already alluded to above, long-term viability of SISs does not depend solely upon access to finance. Many of the schemes reviewed have at some time had access to loan finance, but Mngazi is one of the few that has been able to sustain repayments. Clearly, loan repayments can only be made on a sustainable basis if sufficient profits can be brought into the enterprise. The ability to generate profits depends on many aspects of the enterprise environment, such as institutional support, physical infrastructure, attitudes and aspirations of farmers and competence of farmers, to name but a few.

However, the ability to access loan finance on a commercial basis is going to depend upon the ability to demonstrate clear right of ownership or use to finance providers, and the land tenure system in operation will play a crucial role in being able to do this to the lenders' satisfaction.

There is a feeling amongst loan providers that their role is to select creditworthy customers and hold them to their repayment obligations under the weight of the law. The concept of providing assistance and training in issues such as financial management was not generally seen as part of the credit provider's brief. Whilst this may be well and good in

the case of commercial farming enterprises, it would seem that if emerging farmers are to successfully emerge they will need more nurturing in terms of financial management than they have at present.

Of the secondary issues, which were not included explicitly in the sub-systems chosen for study, one which stood out clearly was the level of training which farmers had had. Many claimed to be adequately trained, but there was evidence that their financial management skills, for example, were not adequate. This is also borne out by the credit providers.

There was also evidence that there was a lack of young farmers, necessary for ongoing viability. Zanyokwe is an old scheme, established in 1985, and at that time many farmers found themselves there by force of circumstance rather than personal inclination. Consequently they did not necessarily have the entrepreneurial abilities or farming interests required for the sustainability of the scheme.

Whilst these issues do not impact directly on access to finance, they do have an impact on the ability of farmers to indulge in sustainable farming activities, and that in turn leads to an inability to service loans satisfactorily.

In terms of the long-term viability of the schemes researched, and the role that access to credit plays in the ultimate success or failure of the enterprise, it needs to be recognised that the blame (or praise) cannot be attributed to one factor alone. A framework for successful implementation of needs is to take a holistic view of all the issues raised in this document.

The above considerations will now all be brought together by allocating quantitative values in the summary matrix to identify the influence that financing has on land tenure and the other support functions.

- **Financing on tenure** – Whilst the land tenure system in place has an impact on the ability to attract finance, the reverse is not the case. However, in an era where land tenure options can be changed, the need for finance could influence farmers to choose options which were more acceptable to finance providers: a 1 is allocated;
- **Financing on production** – Financing of production inputs is an integral part of farm management, and neither case study schemes had reached the stage where they could sustainably finance inputs from profits: a 3 is allocated;
- **Financing on marketing** – As in the case of production as net income increases funds for marketing efforts would become available. However, in the case studies little effort was given to

market development. Only when a more sustainable net income situation is reached, finance for marketing may become necessary: a 1 is allocated;

- **Financing on irrigation** – In the case studies it was found that upgrading or maintenance was needed on the irrigation systems and lack of funds was cited as holding back these activities. The ability to attract and service finance would enable improvements to take place and help to improve turn-over: a 2 is allocated;
- **Financing on institutional** – The institutional problems discussed above relating to the case studies would in general not be ameliorated by financing at a farmer level: a 0 is allocated; and
- **Financing on social** – The same comment applies as for institutional issues: a 0 is allocated.

Thus a total of 7 out of a possible 18 were awarded for the influence of financing on the other factors, as indicated in the matrix below. These figures will be carried forward to complete summary matrix, and discussed in Chapter 10.

FIGURE 7.2: FINANCING MATRIX

	land tenure	production	marketing	irrigation	financing	institutional	social	all	definitions
land tenure	-	-	-	-	-	-	-	-	freehold, quitrent, communal, trust, leased
production	-	-	-	-	-	-	-	-	quantity and quality of output, crop selection
marketing	-	-	-	-	-	-	-	-	effectiveness in reaching markets
irrigation	-	-	-	-	-	-	-	-	adequate water, appropriate irrigation systems
financing	1	3	1	2	0	0	0	7	access to, and effective management of, finance
institutional	-	-	-	-	-	-	-	-	WUAs, CMAs, CPAs, Acts, management
social	-	-	-	-	-	-	-	-	Community attitudes, skills bases, level of training
all	-	-	-	-	-	-	-	-	

**NOTE:** All impacts are row upon column

## **8 INSTITUTIONAL, ORGANISATIONAL AND MANAGEMENT ARRANGEMENTS**

*by D Mosaka<sup>15</sup>*

### **8.1 INTRODUCTION**

This Chapter deals with the institutional, organisational and management arrangements related to land tenure and water management systems, and their impact on SIS.

The Chapter has been structured so that institutional and organisational arrangements are grouped together, with management being dealt with as a separate topic. In all instances, this Chapter presents an historical and current perspective of these topics in an effort to contrast the philosophies and approaches inherent in these periods.

### **8.2 KEY OBJECTIVES**

The key objectives of this chapter are to:

- Analyse the relevant institutional and organisational arrangements that will have the most impact on SISs in order to identify, if possible, which of the land tenure options is best suited to the explicit and implicit intentions that underpin these institutional and organisational arrangements
- Identify the "off-farm" and "on-farm" management arrangements that will be most appropriate for the optimum land tenure options, and
- To evaluate the likelihood of the most appropriate management arrangements that can be successfully implemented based on the observations of experts in the field of small-scale irrigation farming and the insights gained from the case studies investigated as part of this project.

### **8.3 INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS**

This Section presents an overview of the historical and current institutional and organisational arrangements that impact on SIS, as well as an interpretation of the affect that these institutional arrangements would have on small-scale irrigation farmer's attitudes and behaviours. The Section firstly addresses the institutional and organisational

---

<sup>15</sup> Mosaka Associates

arrangements affecting land tenure, followed by a similarly structured Section on water management.

### 8.3.1 Land Tenure

#### 8.3.1.1 Historical Perspective

As indicated in Chapter 4, the history of land tenure in small-scale irrigation has to be understood against the background of the political system that prevailed during the 20th century.

During this time, Blacks were only allowed to farm in predetermined areas. Most irrigation schemes were only started after the publication of the Tomlinson Commission report in 1955. This report had a major effect on land use patterns and irrigation development in rural areas, and many of its effects are still noticeable today. The Commission, as mentioned before, suggested that irrigated holdings of between 1.3 and 1.7 ha would be adequate to provide "a family with a living that would satisfy them, whereby the whole family would work on the holding".

During the 1970s, the so-called self-governing states became independent at a political and administrative level. Land was bought from white farmers and was incorporated into the self-governing states and was placed under the control of the South African Development Trust. In a few cases, attempts were made to settle individual farmers on economic units. However, in most cases, a community based tenure system was introduced, with community participants having housing, grazing and cultivation rights, but no rights that allowed them to sell or lease the land.

The net result of these 20<sup>th</sup> century developments was that most SIS schemes were centrally managed by government, with the participants being no better than labourers with very little decision making power. The key focus was to provide rural communities with a livelihood that would keep them in their rural areas, without regard for the commercial/financial viability of their irrigation farming operations.

All of the institutional, organisational and management arrangements were made and operated by various government departments and government owned institutions. Government funded the arrangement, managed and operated it (with labour input provided by rural communities) and assumed all of the financial and business risk associated with this arrangement.

### 8.3.1.2 Current Perspective

Since the transition to democracy in 1994, land reform in South Africa has been pursued under three broad headings: (As stated in Chapter 4 paragraph 4.4 - repeated for the readers convenience.)

**Land Restitution**, which provides relief for the victims of forced dispossession

**Land Redistribution**, involving a system of discretionary grants that assist people in purchasing/acquiring land; and

**Land Tenure Reform** that is intended to secure and extend the land tenure rights of the victims of past discriminatory practices, and which involves changing the rules that govern land and related property rights.

The framework for land reform policy is set out in the White Paper on South African Land Policy (the White Paper), released in April 1997. The White Paper is based on the following guiding principles: (As stated in Chapter 4 paragraph 4.5.1 - repeated for the readers convenience.)

- Land Tenure Reform must move towards legally enforceable rights to land and away from permits
- Land Tenure Reform must build a unitary, non-racial system of land rights that accommodates flexible and diverse systems of land rights within a unitary framework
- Land Tenure Reform must allow people to choose the tenure system, which is appropriate to their circumstances. Both group based and individually based ownership systems play valuable roles under different circumstances and the match between the circumstances and the system must be made by the people affected.
- All tenure systems must be consistent with the Constitution's commitment to basic human rights and equality, e.g. group based tenure systems must deliver the rights of equality and due process to their members.

In order to deliver security of tenure a rights based approach has been adopted that recognises and accommodates the *de facto* vested rights which exist on the ground. Vested interests include legal rights, as well as interests, which have come to exist without formal legal recognition

In addition to the White Paper on land policy, a number of acts have been promulgated to address tenure security and reform. These include: (As stated in Chapter 4 paragraph 4.5.2 - repeated for the readers convenience.)

**The Upgrading of Land Tenure Rights Act (Act no 112 of 1993)**, which is meant to facilitate the upgrading of various forms of tenure to higher levels of tenure security;

**The Land Reform (Labour Tenants) Act (Act no 3 of 1996)**, which introduces measures to extend tenure security to people defined as labour tenants;

**The Extension of Security of Tenure Act (Act no 62 of 1997)**, which amends the Land Tenure Rights Act and extends security of tenure to farm workers;

**The Communal Property Associations Act (CPAA) (Act no 28 of 1996)**, which facilitates procedures for communities to buy farms, secure tenure for the members of the association and to conduct and manage farming activities; and

**The Communal Land Rights Act (CLRA) (Act 11 of 2004)**, which provides for the transfer of communal land to persons or communities in full ownership, subject to certain conditions. In terms of this Act, the outer boundary of the affected land will be held communally, whilst individual members of a community will be granted registerable land rights for the land they occupy or use in terms of occupation and usage rights.

The White Paper, and the associated legislation described above, advocates a land policy that is focussed on legally enforceable, flexible land tenure rights. In contrast to the historical situation, the current position will enable individuals and/or communities to acquire a secure form of ownership of their land by selecting the tenure option that best suites their circumstances.

Having reviewed the institutional and organisational arrangements related to land tenure, the next section deals with water management.

### **8.3.2 Water Management**

#### **8.3.2.1 Historical Perspective**

Under the previous government regime, commercial farmers operated in an extremely regulated market environment. Over time, this situation

became institutionalised in a number of acts. As indicated in above, most SISs were established on communal land and operated by government and Parastatal agencies.

The then water act gave farmers almost unlimited control over the use of water for irrigation purposes through an organisational arrangement of Irrigation and Water Boards. Farmers were supplied with affordable, subsidized water, where levies were based on the recovery of operating costs and farmers were only responsible for maintenance of the "on-farm" infrastructure.

In the case of SIS, there was no necessity to establish an irrigation board and the government took responsibility for the management of the irrigation equipment.

#### 8.3.2.2 *The National Water Act*

The new National Water Act (Act 36 of 1998) [NWA] provides an opportunity to rethink the paradigm underlying water management in South Africa, and to develop new institutions. Water is now considered a common asset. The right to use water is granted to users, most of whom have to be registered and licensed, and who now pay for this right. Other new concepts of water management included in the new dispensation are management decentralization, and water service cost recovery.

The introduction of the NWA has given rise to two new organisational structures: Catchment Management Agencies (CMA) and Water User Associations (WUA).

##### Catchments Management Agencies

The NWA divides the country up into nineteen river basin groupings, which are known as WMA. It is government's intention to decentralise the management of these WMAs, and to establish a CMA in each WMA. CMAs are intended to be financially independent bodies. The functions and responsibilities of CMAs include:

The development of a Catchment Management Strategy that is in accordance with and gives effect to the provisions and requirements of the National Water Resource Strategy (NWRS) and may not be in conflict with this overall strategy

The management of water resources and the co-ordination of all of the water-related activities of water users and other water management institutions within its WMA

Additional functions can be delegated or assigned to a CMA by the Minister, i.e. the financial and administrative responsibilities for setting and collecting water use charges, and the technical water resources management functions based on the issues identified in the Catchment Management Strategy.

The intention was to have the first CMA established by the end of 2004. The introduction of the remaining eighteen CMAs will take some time. However, once they are established, the management of water in South Africa will be decentralised.

#### Water User Associations

WUAs are co-operative associations of individual water users who wish to undertake water related activities at a local level for their mutual benefit. WUAs operate in terms of a formal constitution as set out in guidelines prepared by DWAF. They are expected to be financially self-supporting based on water use charges that have been determined in a pricing strategy, and that are payable by WUA members.

A WUA falls under the authority of the CMA in whose area of jurisdiction it operates. The WUA may receive delegated powers and duties from the CMA to undertake activities that are within the scope of its constitution. Although new WUAs may be established for any purpose, it is expected that the majority will focus on supporting agricultural water use. Existing irrigation boards must either be transformed into WUAs or be disbanded.

A license to use water may only be issued by a "responsible authority" (i.e. a WUA) to which a prospective user must apply. Water Use Licences give existing or prospective water users formal authorisation to use water for productive or beneficial purposes. Compulsory licensing is intended to:

- Achieve a fair allocation of water from a stressed water resource
- Achieve equity in water allocations
- Promote beneficial use of water in the public interest
- Facilitate efficient management of the water resource, and
- Protect water resource quality

WUAs will be responsible for managing the water allocated under the compulsory licensing system described above in their area of jurisdiction. In areas where no WUA exists, the responsibility will rest with the CMA in whose area of jurisdiction a water license applies.

The NWA urges rural communities and small-scale irrigation farmers to form WUAs. As regards existing SIS, members of these schemes will be

transferred to WUAs. In addition to the responsibilities described above, these rural community WUAs will be able to:

- Support the existing subsistence-oriented farming systems in order to provide food security
- Promote the emergence of commercial farmers using water-conservation technologies,
- Facilitate co-ordinated access to water by the whole community for irrigation, stock watering and domestic uses, and,
- Protect the community's water rights.

These responsibilities should be accompanied by a series of measures and incentives in order that other key functions may also be carried out by the WUA, i.e. access to farming inputs, credit, products, services and information.

The above description of CMAs and WUAs clearly indicates that government is committed to decentralising the management of water affairs. Unlike in the past, where water users simply paid the water use levies that they were charged and left the management of water supply infrastructure to government institutions, the new situation will require that water users become directly involved in managing (and even establishing) their own water supply infrastructure.

This responsibility includes the critical task of setting and collecting the water use levies that will largely fund the entire water supply system in South Africa. This is an onerous responsibility that will require considerable expertise and commitment. The NWA will encourage small-scale irrigation farmers to take responsibility for managing the supply of the water they use, and will require them to pay a water tariff that is more fully representative of the real cost of water supply.

### **8.3.3 Summary of Institutional and Organisational Arrangements Affecting SIS**

Table 8.1 below presents a summary of the current and new institutional and organisational arrangements that will affect small-scale irrigation farmers.

TABLE 8.1: SUMMARY OF INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS

	INSTITUTIONAL ARRANGEMENTS		ORGANISATIONAL ARRANGEMENTS	
	Land Tenure	Water Rights	Land Tenure	Water Rights
"Off-Farm" Arrangements	The White Paper on Land Policy (April 1997)	The National Water Act (Act 36 of 1998) [NWA]		Catchment Management Agencies (CMAs) Water User Associations (WUAs)
"On-Farm" Arrangements	The Upgrading of Land Tenure Rights Act (Act no 112 of 1993) The Land Reform (Labour Tenants) Act (Act no 3 of 1996) The Extension of Security of Tenure Act (Act no 62 of 1997) The Communal Property Associations Act (CPAA) (Act no 28 of 1996) The Communal Land Rights Act (CLRA) (Act 11 of 2004)		Community Property Associations (CPAs)	

Source: Authors' analysis

Table 8.1 indicates that there is a considerable amount of new legislation that affects mostly "on-farm" land tenure arrangements. As we have seen, this legislation is aimed at ensuring that small-scale irrigation farmers (amongst others) will be able to obtain legally enforceable rights to their land. Furthermore, this legislation makes provision for various

forms of individual (i.e. freehold) and communal ownership arrangements such as the Community Property Associations that have been formed to purchase and manage farms on a communal basis.

In the case of water management, the NWA affects mainly the "off-farm" water supply and management situation. In essence, this new legislation decentralises water management into the hands of the new CMAs and the WUAs organisational structures. The thrust of these new arrangements encourages farmers/water users to take "ownership" of and responsibility for their livelihoods. Clearly, these developments have serious implications for the management of both water supply infrastructure and the irrigated farms affected by these arrangements.

The net result of the changes to institutional and organisational arrangements affecting land tenure and water management is that government will no longer be directly involved in controlling SIS. Small-scale irrigation farmers will now have the right and responsibility for determining their own land tenure and water management arrangements, and for directly managing their SIS.

#### 8.4 MANAGEMENT ARRANGEMENTS

So far, this Chapter has presented an overview and discussion of the historical and current institutional and organisational arrangements of land tenure and water management systems that affect small-scale irrigation farmers. This Section focuses on management, which is discussed in the context of "off-farm" and "on-farm" management arrangements.

Unlike in the past, where government departments mostly centrally managed water, the current situation creates a need for small-scale irrigation farmers to become involved in "off-farm" management arrangements such as the CMAs and the WUAs. The definition of "off-farm" and "on-farm" management used in this Chapter is as follows:

##### "Off-farm" Arrangements

"Off-farm" arrangements include all institutional, organisational and management arrangements that relate to bulk water supplies that take place between (mostly) existing bulk water supply infrastructure (i.e. dams, weirs, pipelines, pumps, etc.) and existing and new local water users.

##### "On-farm" Arrangements

"On-farm" arrangements include only those organisational and management arrangements that relate to the on-going, day-to-day operational management of small, irrigated farms, i.e. purchasing of input supplies; land preparation and management; crop planting, watering, fertilising, harvesting and marketing; farm resource management - including land, equipment, finances, people, information, etc.

#### **8.4.1 Historical Perspective**

In the case of commercial irrigated farming, Irrigation Boards were responsible for the maintenance of the "off-farm" water infrastructure and the overseeing of the supply and use water by individual farmers. Nearly all farmers farmed as individuals within a system of private tenure, and only shared the water delivery system provided by the irrigation boards.

As we have seen, SISs were established in the homelands on specially constructed sites situated on communal land. There was no necessity to establish irrigation boards, and the government took direct responsibility for the management of "off-farm" and "on-farm" water supply, as well as all "on-farm" operations.

#### **8.4.2 Current Perspective**

With the advent of the new Government, many of the old structures were dismantled, and management of both the "off-farm" and "on-farm" arrangements was transferred to provincial government departments and directly to the farmers.

In many cases, provincial agriculture departments struggled to establish appropriate structures and to effectively manage the transformation process. People were simply not properly prepared to accept and manage the SISs. Officials from the old homelands had very little experience of commercial agriculture, whilst others were used to a centralized management style implemented by the central government. There was infighting about areas of seniority and responsibility linked to inexperience, which was a recipe for slow decision making and failure of the irrigation schemes.

#### **8.4.3 "Off-Farm" Management Implications for SISs**

As indicated in Table 8.1, "off-farm" management for SISs is focussed on the involvement of small-scale irrigation farmers in the governance and management of CMAs and WUAs.

#### 8.4.3.1 *Involvement at the CMA Level*

In the case of CMAs, there will, in all likelihood, be very little involvement for small-scale irrigation farmers at this level. One or two individuals will probably be required to attend CMA meetings, and to negotiate the inclusion and involvement of their WUA in the overall Catchment Management Strategy that will be applicable to the WMA within which they are located. Clearly, effective involvement at this level will require a competence in long term, strategic thinking and planning, and effective negotiating skills.

#### 8.4.3.2 *Involvement at the WUA Level*

Small-scale irrigation farmers will be directly and intensely involved in their WUAs. In all likelihood, small-scale irrigation farmers will be required to set up their own WUAs and, therefore, will not be able to "piggy back" on the expertise that exists in WUAs where more experienced water users may be present. Essentially, small-scale irrigation farmers will have to "paddle their own canoes".

Management at the level of a WUA will require some competence in long term, strategic planning as regards ensuring adequate supplies of the right quantities and qualities of water, and the establishment and maintenance of appropriate water supply infrastructure. This competence will underpin the ability of the members who will represent the WUA at CMA level.

However, the main competences that will be required at WUA level will be the knowledge, skill and aptitude to effectively manage and administer the operations and the finances of a WUA. An element of these competencies will be "water/technical" in nature, however, the main competencies will focus on administering the allocation and metering of water to individual users, the setting and collection of levies, and the management of WUA finances, including maintaining provisions for maintenance and repair expenses and capital improvements.

Clearly, the requirements for functioning effectively at both a CMA and WUA level imply that individuals who are involved in the management of WUAs and who represent WUAs at CMA level will need to be competent managers. They will not only need to have the strategic and functional knowledge and skill to operate at these levels, but they will also need the aptitude (i.e. attitude and talent) to fulfil these responsibilities effectively.

In areas where irrigation boards with proven administrative capacity exist, it will be relatively easy to transform these into new WUA entities.

However, DWAF has found that it is much more difficult to establish WUAs in areas where, previously, there was no formal organisation structure. Factors that are delaying the process include a lack of funds, unwillingness on the part of water users to pay levies, and a shortage of capable people from the local community to serve on the WUA governing boards.

#### 8.4.4 "On-Farm" Management Implications for SIS

The new institutional and organisational arrangements affecting land tenure and water management have major implications for "on-farm" management of a SIS. These new arrangements will compel small-scale irrigation farmers to:

- Decide which land tenure option they wish to choose that best suits their circumstances; and, having made this choice;
- Make their own arrangements regarding their involvement in the "off-farm" organisational structures that affect their water supply (i.e. the CMAs and WUAs); as well as deciding on how they will manage all of the "on-farm" activities that they now have responsibility for (i.e. operations, finance, marketing, etc.).

If the farmers choose a community-based land tenure system (i.e. a CPA), they are committed to managing their "off-farm" water supply and "on-farm" activities on a shared responsibility basis. Conversely, if they were to choose some form of individual ownership option (i.e. freehold rights), each farmer will be individually responsible for his/her own "on-farm" activities, whilst participating in the election of individuals to represent them at the CMA and WUA level.

#### 8.4.5 A Comparison of Community and Individual Management Systems

Table 8.2 presents the relative strengths and weaknesses of community versus individual management systems as related to the management of a SIS that operates in the current institutional and organisational arrangements affecting land tenure and water management.

Irrigation farming, on itself, places disciplines on farmers that are not present in dry land farming. Irrigating crops imposes a fairly rigorous daily and crop cycle routine that must be carefully followed if irrigation farming is to be a productive operation. Adhering to this routine requires commitment and discipline, particularly on the part of the farm owner/manager.

Given the fact that SIS farmers operating with the current institutional and organisational arrangements must pay for the water they use, as

well as paying for the cost of maintaining their off and "on-farm" water supply and irrigation equipment, means that SIS farming must be a financially viable enterprise. Financial viability will affect many decisions regarding farming operations (i.e. crop selection, technology selection, crop management, financing, staffing, marketing, etc.). Frequently, these are difficult decisions to make when a balance needs to be struck between social/community versus profitability considerations.

**TABLE 8.2: RELATIVE STRENGTHS AND WEAKNESSES OF COMMUNITY VERSUS INDIVIDUAL MANAGEMENT SYSTEMS**

	Community Ownership/Management	Individual ownership/Management
Strengths	<ul style="list-style-type: none"> <li>Ability to create groups of specialists</li> <li>Shared work load</li> <li>Communal wisdom</li> <li>Rooted in cultural heritage</li> </ul>	<ul style="list-style-type: none"> <li>Congruent accountability, authority and responsibility</li> <li>Optimal decisions – more focussed</li> <li>Faster decision making/response time</li> <li>Encourages/rewards entrepreneurship</li> <li>Committed owners/managers (if properly incentivised)</li> <li>Can encourage growth and expansion</li> </ul>
Weaknesses	<ul style="list-style-type: none"> <li>No single accountability</li> <li>Consensus decision making – time consuming</li> <li>Compromise vs. optimum decisions</li> <li>Individual commitment often lacking – may suppress individual entrepreneurship</li> <li>May not encourage growth and expansion</li> </ul>	<ul style="list-style-type: none"> <li>Centralised authority – command style</li> <li>Overloaded individuals</li> <li>Can discourage participation / commitment of workers if not properly incentivised</li> </ul>

Source: Authors' analysis

Table 8.2 suggests that individual ownership/management may be more suitable for managing a successful, financially viable SIS. In addition to the factors presented in this table, experience shows that private sector financiers tend to favour individually owned/managed-farming enterprises.

This implies that communally owned SIS may not be as successful as individually owned/managed options, and they may also be more dependent on government funding to sustain their operations.

## **8.5 CASE STUDY EXPERIENCES**

This Section presents the findings emanating from the case studies analysed as part of this project.

### **8.5.1 Institutional and Organisational Arrangements**

With regard to the case study sites, it was evident that the current institutional and organisational arrangements are still new to small-scale irrigation farming. A case in point is the issue of WUAs.

It was abundantly clear that the farmers at Zanyokwe and Mngazi were not familiar with the concept of a WUA. In the case where a WUA had been formed, small-scale irrigation farmers have had a very poor success rate. This state of affairs can be attributed to the fact that these farmers are not well informed about the intentions and workings of WUAs, and other institutional arrangements in general. Irrigation boards are still viewed by farmers as a burden due to the fact that they are still inexperienced. This aspect, as well as that of irrigation management transfer, needs to be entrenched with farmers in the study area so that they can start adapting to the new institutional and organisational arrangements.

The farmers would like to see both Provincial and local Agricultural and Water Affairs Departments performing education and awareness training. However, they are concerned about the poor level of co-ordination and communication that takes place between different government agencies, especially at provincial level.

A further factor affecting farmers at the case study sites is the institutions governing the use of communally held land, which is a common tenure system at the case study sites. The existing systems do not provide individuals or farmers with economic incentives to invest.

The following organisational services are still out of reach at the case-study sites.

- Banking services
- Land preparation and maintenance services
- Training and extension services
- Retail outlets and marketing services
- Input markets (including planting material, fertilizers etc.)

The general perception of farmers at the case study sites is that banks need to be innovative and design banking products that are tailored to suit their needs, especially the Land Bank. They believe that this will enhance their repayment of loans.

With regard to marketing services, the University of Fort Hare is assisting farmers in forming a partnership that will open up a marketing channel with Pick and Pay. This arrangement, if successful, will encourage farmers to produce high quality products and boost their morale.

The Mngazi scheme is situated next to a very busy road and farmers at this site are selling directly to customers along the road. However, the ideal situation would be for farmers to enter into supply contracts with formal retail outlets.

Another important issue is training and capacity building. The farmers at the case study sites, and the Provincial Extension Officers that are supposed to support them, are not adequately trained as regards farming operations. This lack of support is contributing to the farmers being frustrated and being unable to achieve their goals.

It is important that the Primary Agriculture and Education Training Authority (PAETA) become more active at places like the case study sites. This will improve the level of training of farmers through the various skills programs and learnerships offered by this organisation.

#### **8.5.2 Management Arrangements**

With regard to the Zanyokwe and Mngazi irrigation schemes, the following issues warrant discussion: a lack of properly qualified scheme managers, water bailiffs, extension officers and the farmers themselves.

The farmers are looking to the extension services to provide marketing, production, management and other advisory services. However, due to a lack of commitment on the part of the extension service officers, this is lacking.

At Zanyokwe, the dependency syndrome that was created by the previous parastatals is still very much in evidence. In contrast, the situation at Mngazi appears to be much better. The extension officers there are qualified and appear committed to supporting the farmers operating at this site. The overall management of this scheme appears to be sound, judging by the progress that has been made regarding farming operations and marketing arrangements.

In summary, the new institutional and organisational arrangements are not functioning well at the case study sites. The communal ownership option that applies at these two sites, and the culture of disempowerment created by the past management system, does not seem to be encouraging farmers to tackle the issues that face them. Secondly, the WUAs that need to be established at these two sites are also not functioning properly, with the result that there is much confusion regarding who is responsible for ensuring and maintaining adequate water supply.

The most significant issue seems to be the poor level of extension services support that farmers are receiving, particularly at Zanyokwe. The analysis of these two case study sites suggests that these farmers are still a long way from being able to function effectively within the new institutional and organisational environment. They will need a considerable amount of education, training and support before they are able to independently manage financially viable SIS at these sites.

## 8.6 CONCLUSIONS AND RECOMMENDATIONS

As indicated at the beginning of this Chapter, the key objectives in analysing the institutional, organisational and management arrangements related to land tenure and water management systems, and their impact on SIS, were to:

- Analyse the relevant institutional and organisational arrangements that will have most impact on SIS in order to identify, if possible, which of the land tenure options is best suited to the explicit and implicit intentions that underpin these institutional and organisational arrangements
- Identify the off and "on-farm" management arrangements that will be most appropriate for the optimum land tenure options, and
- To evaluate the likelihood that the most appropriate management arrangements can be successfully implemented, based on the observations of experts in the field of small-scale irrigation farming and the insights gained from the case studies investigated as part of this project

As discussed in this Chapter, the institutional environment within which small-scale irrigation farmers operate has changed dramatically. The new NWA and, specifically, the creation of CMAs and WUAs will have a major impact on SIS. The clear intention of this Act is to decentralise the management of water supply and to compel water users to take direct responsibility for managing their own water supply, including setting and collecting levies. In the case of small-scale irrigation farmers, these people are now required to successfully managing their own SIS farming

operations, without the level of Government involvement that took place in the past. As such, small-scale irrigation farmers are no longer disempowered workers, labouring on their own farms, but are now fully responsible farm owners and managers.

### 8.6.1 Conclusions

With regard to "off-farm" management of water supply, small-scale irrigation farmers will need to play a central role in managing their WUAs. The two case studies analysed as part of this project indicate that small-scale irrigation farmers are not as yet ready to play this role effectively. For one thing, they are not even aware of the role they are supposed to be playing, let alone having the management competencies to function effectively at this level.

As regards "on-farm" management, small-scale irrigation farmers are now obliged to take full responsibility for managing the financing and operations of their farms, as well as the marketing of their produce. The case studies indicate that the farmers operating in these two sites are struggling to survive. They do not have the level of expertise to function independently, and are still very much dependent on effective extension services for finance, advice and support.

In evaluating land tenure options, and, in particular, the communal and freehold options, it seems as if the NWA is neutral as regards "off-farm" management of water supply. Land ownership status should not affect the ability of water user representatives to function effectively at either a CMA or WUA level. These individuals will be the elected/selected representatives of groups of water users. As such, they will need to consult with these groups to ensure that the needs of these users are being satisfied by collective decisions made at CMA and WUA level. Therefore, land ownership status should not be a significant influencing factor at this level.

As regards "on-farm" management, land ownership status is likely to be a more significant issue. Farming experience in South Africa, both dry land and irrigation farming, suggests that freehold farming is more successful than communal farming. However, this differentiation may actually have less to do with land ownership status, and more to do with the level and quality of support given to farmers.

It is common cause that, in the past, (mostly white) freehold farmers were given significant levels of support of all kinds, i.e. financial, operational, marketing, etc. In many instances, services were provided

by government organisations (i.e. Land Bank, Co-operatives, marketing boards, etc), whilst many resource inputs were heavily subsidised. This system made it possible for many marginal farms (and farmers) to sustain profitable operations, despite their inherent unsuitability. The fact that a significant number of these farms have been liquidated since the introduction of more free-market policies in the broader agricultural industry supports this argument.

As regards small-scale irrigation farming, these (mostly black) communal farmers were, in the past, in fact nothing more than labourers, working on SIS that were financed, established and operated by government departments. This system did nothing to encourage or support farmers to take responsibility for their farming operations. Rather, it was a disempowering system that, in the new agricultural environment, has left most of these small-scale irrigation farmers totally unprepared for survival in a competitive, free market where government is in the process of withdrawing into an enabling/facilitating role as apposed to its active participant role of the past.

To the extent that this assessment is valid, land ownership status for small-scale irrigation farmers is not likely to be a significant factor in their survival. Rather, the availability and quality of the financial, operational and marketing support they receive is likely to be a far more important factor.

### **8.6.2 Recommendations**

This conclusion suggests that government should not be too hasty in withdrawing from small-scale irrigation farming or, for that matter, any kind of farming where emerging black farmers are involved. Experience suggests that government should place significant emphasis on providing subsidised financing (or security) and high quality extension services to this group of farmers.

In addition, it is also very obvious that the changing institutional environment necessitates the development and implementation of comprehensive training programs for present and future farmers. These programs must make provision for practical farming operations training, but must also address financial, marketing and more general management requirements as well.

Most of the institutional changes implemented by government so far have resulted in making the South African agricultural industry more competitive, and have encouraged increasing productivity. However the

question must be asked whether what is appropriate for established commercial farmers is necessarily good for small-scale farmers from a very disadvantaged background.

#### **8.6.2.1 Extension Services**

Observations made at the case study schemes force us to comment that, at present, the support services available to small-scale irrigation farmers have not adapted as quickly as the institutional environment, and these farmers do not understand the concepts of economic efficiency and sustainability. Therefore, it is necessary that an enabling environment be created to guide and support these farmers through their initial start up years.

Comprehensive extension services must be an integral part of the agricultural policy of the government. These services must exist for an array of farming disciplines, so that advisory services can be delivered over a wide range of skills. Frequently, existing extension staff has not received multi-disciplinary training. Most of the time, they can competently advise farmers on practical farming problems, but they are not trained in management, marketing, finance, conflict resolution, etc.

The present policy seems to be to create regional extension offices, with specific field officers dedicated to specific areas, supported by skilled specialists in each office. However, the case study analysis indicates that these specialists are not being called upon, possibly because the field officers are concerned about losing face if they have to ask somebody else for help.

Furthermore, the case study analysis indicates that there appears to be a shortage of irrigation farming skills in some of the regional offices. Irrigation agriculture is a very demanding, and much of the knowledge required to advice on practical irrigation matters can only be acquired over time.

A further issue is that, given that many of the irrigation farmers are woman, there is a need for more trained female advisors.

#### **8.6.2.2 Farmer Training**

In any business, formal and informal training in background knowledge and practical skills is an integral part of the success of the venture. One of the problems of introducing the rural population to irrigation farming is that these future farmers have very little knowledge of what is involved

and they very often could not envisage the strict and strenuous management regime that would be involved in irrigation farming.

The top down management structure adopted by the development agencies of old did not encourage self-development. Any training that did take place was a product of the policies of the time and was very haphazard. Furthermore, in the rural Xhosa tradition, the men were the warriors and the stock farmers, whilst the women worked the lands. However, when the first SISs were introduced, the men were identified as the prospective farmers. All training was focused on them, ignoring the fact that it would actually be the women who would be doing the actual farming.

One of the conditions for successful future SIS farming will be that prospective farmers are properly trained in a number of applicable skills. In order to make a success of training, it will be necessary to first expose prospective farmers to processes that can identify individuals that will benefit from training. This recommendation is based on the belief that only certain individuals will have the necessary talent and motivation to manage a small-scale irrigation farm successfully. Once these high-potential individuals have been identified, they would receive more intense, in depth training in the broad variety of fields in which they will need to become competent.

Training must be practical, i.e. it must include an appropriate balance of knowledge theory and practical skills training. Ideally, the extension officials described in the previous Section should deliver much of this training.

#### **8.6.2.3 Land Tenure**

Government has declared its intention to reform land tenure arrangements in the tribal areas and, although no finality has been reached yet, it is clear that the goal is to empower individuals and communities rather than traditional tribal leadership.

To some extent, "on-farm" management structures will depend on the land tenure arrangement in place and the links, family or otherwise, that exist between farmers. As such, it will be necessary to formalize these structures in order to, as far as possible, prevent conflict.

Practical matters such as irrigation periods, crop selection, financial issues, non-payment of water levies, weak performance by members, etc must be addressed as part of the irrigation management arrangements put into place. In addition to "on-farm" irrigation matters,

the questions of grazing and home ownership rights should also be addressed. If these can be separated from irrigation farming issues, non-performing irrigation farmers could be sidelined and replaced by more competent individuals, which would safeguard members' homesteads and the right to communal grazing, whilst making it possible to introduce the concept of individual performance.

#### **8.6.2.4 Financing and Managing a WUA**

The management and financing of WUAs will be the responsibility of the local community in the area in which they operate. The involvement of the SIS in the running of the WUA could be seen as a positive contribution to the community as it would expose them to administrative and management processes.

Financial contributions could become a burden, especially if the SIS has to carry a substantial segment of the cost. It will probably be necessary for either the Department of Water Affairs or the Department of Agriculture to provide some form of relief in the initial stages of the process.

Most WUAs will require start up funds; with the result that exempting a SIS from paying levies will not be enough, particularly as this might encourage a culture of non-payment. As such, some form of subsidy for the WUA would have to be as a bridging step in order to allow these schemes to adjust to the changing circumstances.

#### **8.6.3 Conclusion**

As a final comment, this chapter suggests that land tenure arrangements (i.e. communal versus freehold rights) are not likely to be a major issue with regard to the institutional, organisational and management arrangements affecting SIS farming. Rather, appropriate training and development and high quality extension services are likely to be far more relevant issues in ensuring the success of this form of farming in future.

In the following section the matrix for this chapter would be completed to determine the influence of the Institutional, Organisational and Management arrangements on the rest of the identified factors playing a role in the success of a SIS.

All though this chapter discusses the Institutional, Organisational and Management arrangements we will only mention institutional when actually referring to all three factors.

- Institutional arrangements on land tenure – the Government sets the scene for the development of the tenure options, it is therefore a very influential player and a 2 is awarded.
- Institutional on production – the influence of the three factors are low on production and a 0 is allocated.
- Institutional on marketing – the factors does play a role in marketing depending on Government policies at any given time and a 1 is awarded.
- Institutional on irrigation - no influence were identified and a 0 is awarded.
- Institutional on finance – the policy framework put in place by Government and the organisational and management measures flowing from this will impact on finance and a 2 is awarded.
- Institutional on Social – policy initiatives like the introduction of the Community Lands Rights Act and Water Use Associations does impact on the social life and community structure of the rural population and a 2 is awarded.

The total for this Section adds up to 7 out of a possible 18, which indicates that it is important, but not the only factor playing a role.

FIGURE 8.1: INSTITUTIONAL, ORGANISATIONAL AND MANAGEMENT MATRIX

	land tenure	production	marketing	irrigation	financing	Institutional	social	all	definitions
land tenure	-	-	-	-	-	-	-	-	freehold, quitrent, communal, trust, leased
production	-	-	-	-	-	-	-	-	quantity and quality of output, crop selection
marketing	-	-	-	-	-	-	-	-	effectiveness in reaching markets
irrigation	-	-	-	-	-	-	-	-	adequate water, appropriate irrigation systems
financing	-	-	-	-	-	-	-	-	access to, and effective management of, finance
institutional	2	0	1	0	2	0	2	7	WUAs, CMAs, CPAs, Acts, management
social	-	-	-	-	-	-	-	-	Community attitudes, skills bases, level of training
all	-	-	-	-	-	-	-	-	

NOTE: All impacts are row upon column

## 9 INFLUENCE OF SOCIAL FACTORS

by D Mosaka<sup>16</sup>

### 9.1 BACKGROUND

Both small-scale and large projects in the irrigation sector could be impacted on by social factors, although dealing with them may differ between the two categories. For small-scale projects, handling the social impacts on the project is essential for its sustainability.

The potential impacts of social factors on small irrigation schemes are widespread, but in this section the focus will be on the following:

- Socio-psychological factors
- Socio-economic factors
- Social and physical factors

In this section pertinent issues relating to each of the three categories will be examined and a perspective will be provided for each from both a theoretical and case study analysis point of view. Of great importance is the fact that a perspective will also be provided on how land tenure impacts on this social issues. This is in line with the basic model around which the methodology used in approaching this project has been built (see Figure 3.1).

This model places land tenure at the hub and in so doing requires interactions between various sub-systems to continually refer back to the land tenure issue. This structure is followed in order to ensure that the focus of the research remains with land tenure, and that the whole action is played out against the pervasive background of the social issues which have formed the core of the development of many SISs.

### 9.2 THEORETICAL PERSPECTIVE

In this portion an examination of socio-psychological, socio-economic and social and physical factors based on the literature dealing with the subject of different farm tenure systems and support structures for establishing small-scale irrigation farmers in long-term viable conditions is carried out.

---

<sup>16</sup> Mosaka Associates

### 9.2.1 Socio-psychological Factors

Examples of major socio-psychological factors to be considered in small-scale irrigation projects are culture, conflict and gender. These are discussed below.

#### Culture

Land and culture are intimately related. A community or a nation's vision of who they are, its identity and culture is bound up with land. Culture in this portion is used in an anthropological sense, to refer to the shared meanings, norms and understandings which people living in communities used to make sense of themselves and others, as well as the world around them (Cohen, 1993). It is very important to explore the cultural meanings which are inextricably attached to land. Integral to this aspect is to consider as well the culture of irrigation practices on land, the culture of livelihood patterns and the culture of indigenous knowledge in irrigation farming practices. Muriithi et al (2003) suggests that if projects undertaken are put through the filter of cultural values, and then compared to the project environments in Africa, an appropriate framework can be developed. Using this framework, appropriate approaches to project implementation in Africa can be proposed.

In the author's experience, relevant examples of cultural values that are dominant in African culture are:

- Extended family ties. The overwhelming patterns of allegiance are to families, clans and ethnic group.
- Individualism/collectivism is the extent to which people define themselves as individual entities or in terms of groups (e.g. family, clan etc.) as the primary source of work and solutions to their problems. African cultures are thus seen as collectivist, leaning towards extended family ties, clans and ethnic groups.
- Masculinity/femininity. Masculine traits are valued over feminine values.
- In Africa, society has a moralist orientation. Individuals are judged by fulfilling their moral obligations to family, clan, and ultimately to ethnic group.

The impact that the above-stated issue have on small-irrigation schemes should never be underestimated.

#### Conflict

Possible causes of conflict in small irrigation schemes found in the literature and during site visits to the case study schemes are varied and could include:

- Minor disputes involving for example damage to crops;
- Access to water;
- Competition over scarce land, together with lack of off-farm opportunities, frustration and lack of hope for the youth;
- In-migration by different ethnic groups seeking land;
- Gender disparities in access to irrigated land;
- Shrinking land area available per person;
- Dispossession of small-scales by customary chiefs, government officials and urban investors seeking to buy land;
- Uncertainty regarding rights over land, due to the confusion between customary and modern legislation regarding tenure;
- Lack of communication and opportunities to meet and discuss the growing tension;

Very often one of the contributing factors in the failing of the schemes is conflict between the farmers. It is often rooted in political differences between groups or family (clan) oriented feuds. Also in the case of existing schemes there are cases of jealousy, perceived corruption or being excluded from the decision making process by other farmers.

Cotula et al (2004) propose a number of recommendations for handling conflicts, amongst which are:

- Support to rural development including off-farm income generating activities, to relieve pressure on land.
- More intensive, yield enhancing measures to help raise harvests and enable small-scale farmers to diversify into new forms of farming, such as fruit trees, fattening of small stock, and vegetable gardening.
- Reforming the large-scale commercial sector, which has taken much land away from small-scale farmers, uses it inefficiently, and generates little or no revenues for re-investment locally.
- Finding ways to bring together the different parties to discuss how to reach a collectively agreed solution.
- Training of local administrators and community level personnel to carry out such tasks, with checks and balances provided by local structures, NGOs and other civil society groups.

#### Gender Issues

Disparities in male/female access to land are virtually universal. In most African counties men and women do not have equal access to land, even in those countries where legislation has removed gender barriers to land ownership.

Throughout Africa, women enjoy very limited rights to land. Natural resource legislation tends to be gender neutral or to explicitly prohibit sex or gender discrimination in relation to land. However, legislation is

scarcely implemented in rural areas, and customary land tenure is what is usually referred to.

Women's rights under customary systems vary considerably from place to place. Substantial differences exist between patrilineal and matrilineal societies, with women generally having greater land rights under matrilineal systems, as well as between different matrilineal systems and between different patrilineal systems. However, broadly speaking, women usually only have rights derived from those of their husbands or male relatives. Moreover, women face discrimination with respect to the allocation of individual fields. When access to a plot is granted, this may be on land which other male relatives do not want because, for example, it is not very fertile, difficult to work, or not suitable for animal traction. Despite this the expected role of women is to be the workers on the land.

Rural communities need to be sensitised through participatory methods to encourage them to incorporate female members in their local organisations management committees, and ownership of land by women will be encouraged within the reality of socio-cultural constraints.

Women will be encouraged to participate in small scale irrigation projects through public awareness campaigns that can allow women to go through exchange visits and seminars.

According to Cotula et al (2004) Government needs to promote the greater involvement of women in community organizations and irrigation developments. This will include:

- Ensure that public awareness campaigns concerning irrigation programs include women;
- Facilitate women's participation in irrigation decision making, plot ownership and management;
- Recognise the importance of gender roles in irrigation in all training programs;
- Tailor public awareness campaigns and extension services in irrigation programs to the different roles and priorities of men and women;
- Ensure that irrigation extension service is provided to female headed households;
- Encourage the development of women's organisations in rural areas in collaboration with concerned Ministries and non-government organisations (NGOs);
- Remove barriers against women in accessing credit and land.

### 9.2.2 Socio-economic Factors

There exists a wide range of socio-economic factors that have a bearing on both the success and failure of small irrigation schemes. In this instance the issues in regard to the impact of socio-economic factors that will be dealt with are poverty and HIV/AIDS.

#### Poverty

Land is a principal source of income and employment for majority of households in rural communities. In rural areas where most communities are hosted, size and quality of irrigation land are some of the determinants of poverty.

Poverty in terms of land owned also means limited capability to benefit from public services such as education and health. Land determines both the social status and political participation. On the other hand, the undeveloped state of agriculture, lack of irrigation, use of traditional technology, subsistence production, in access to market, have driven even relatively large landholders into the state of poverty. Improved land distribution accompanied by modernising agriculture has the potential to dramatically reduce the incidence of poverty.

The high incidence of poverty among small holders is due to both low holding size and own land productivity. Indeed, incidence of poverty among relatively large holdings attest the importance of considering productivity along with holding size in identifying the incidence of poverty.

Moreover, within the context of land redistribution, past experience shows that providing the landless with access to land achieves little if this is not accompanied by improved access to credit, extension and markets. This issue should therefore be addressed when implementing land redistribution programmes.

Changing the patterns of land holding and use may also be a crucial element of broader poverty reduction strategies. However, the Poverty Reduction Strategy (PRS) developed by many African countries over the last decade rarely identify land reform as a key instrument for poverty reduction.

Thus, land policies and laws need to be formulated and implemented within the broader context of a coherent and comprehensive policy and institutional environment geared towards agricultural development, food security and poverty reduction. (Hunter *et al* 2003).

### HIV/AIDS

Recent case studies from Kenya, Lesotho and South Africa (Drimie, 2002), document the effects of HIV/AIDS on land use, on land rights, and on land administration systems. As for land use, the main effects relate to loss of labour force caused by the disease. This may entail that households are no longer able to farm their lands at the level required to meet their subsistence needs. For instance, in some countries in Africa it was found lower agricultural yields as some land farming activities had to be abandoned or postponed due to labour shortages. In some cases, households are able to cope with increased vulnerability by hiring labour, by renting out land, by entering into sharecropping arrangements or by selling land. Hiring external labour requires resources to pay wages and is therefore limited to the households that can afford it. Renting out land provides families with constant cash flow but is often constrained by underdeveloped or even prohibited land rental markets. Entering into sharecropping arrangements in a situation of vulnerability, such as that caused by a HIV/AIDS-affected "breadwinning" family member, weakens the negotiating power of the family vis-à-vis third parties. Where families are unable to respond to the situation, land may be left fallow or under-cultivated. Besides negatively affecting agricultural productivity, this may create problems in countries where effective occupancy and use regulations require land forfeiture in case of non- or under-use. For instance, in some countries the Land Act provides for land reallocation if the land is not cultivated for two years. This measure, originally conceived on productivity and equity grounds, entails that HIV/AIDS affected families may lose their land if they are unable to cultivate it.

### **9.2.3 Social and physical Factors**

Since 1994 the Government put a lot of effort and funds into rural development in an attempt to create a physical and social infrastructure that would encourage development. However, the backlog is so large that it will take a long time before equality is reached. It is not only physical infrastructure that requires attention but also social infrastructure. The social and physical factors that will be the focus of attention are health and social services, water and sanitation, education and training, communications and transport, electricity, and education and capacity building.

#### Health and Social Services

Over time health services have deteriorated in the black rural areas; many of the hospitals are in urgent need of upgrading.

The government has made a concerted effort to construct clinics in the rural areas where a wide range of free health services are offered to the local population. It is however difficult to attract qualified medical staff to these areas, so much so that the government has introduced a community service year for young qualified doctors and also introduced a number of monetary measures to entice qualified people to come to these areas.

Although as said above the services are improving the reality is that it will be impossible to bring these services to the doorstep of all communities and will some of the more distant communities always have to travel a substantial distance to make use of the services.

#### Water and Sanitation

Many of the rural poor are still dependent on surface water sources for their drinking water needs. However, local and provincial authorities have made concerted efforts to improve the situation especially as far as drinking water is concerned. The situation is however not yet under control and in most cases sanitation facilities are very rudimentary.

Improved facilities would obviously led to an improvement in the general health of the population and the general well being of the community.

#### Communication and Transport

Public transport is in most of the rural areas in a poor condition and must the population use available private facilities, which is very often unreliable and expensive.

The physical infrastructure in as far as roads and telephone services are in many cases not good, very often there is one good road (tarred) and the rest of the roads not much more than dust tracks. Around most of the town's cellphone reception is available but out into the rural areas it is not available, the same apply for landline telephone services.

#### Electricity

The availability of electricity is improving but the cost is becoming a restrictive factor and it would probably be impossible to supply a connection to each outlying village or home.

#### Education and Training

Since a unified school system has been introduced with a single matriculation exam at the end of grade 12 the shortcomings of the rural black schools have been highlighted year after year. Overcrowding, lack

of learning material, dilapidated infrastructure and a lack of qualified high school teachers have all aggravated the situation.

After school training facilities is also not available in the rural areas while employment opportunities are limited.

If the demographic realities are taken into account the prospective male farmers will be elderly. A number of the prospective farmers will be female. Both groups would probably be semi-illiterate with only primary and junior secondary education levels at best. The group would probably been exposed to present farming methods prevailing in the area which is probably of low management, low cost and low yield levels. Some of them, specifically the women would because of family, tradition and other realities never have travelled very far and the world that they know is very localised.

These realities will have to be taken into accounting the development of a capacity building program. It will have to make provision for an adult education program, the basic rules of business management, bookkeeping and exposure to new ideas. Very often capacity building programs just concentrate on teaching the future farmer the practical know-how, this is necessary but it is also important that the beneficiaries from the beginning be introduced to rest of the programs. He or she must understand that to be farmer is not only to move the pipes but also to understand why the pipes must be moved!

The selection of beneficiaries of the irrigation project would cause tensions in the community, which will have to be addressed in a community development program as part of a capacity building program. As previously stated the community is an integral part of the everyday lives of rural Africans and an irrigation project can only benefit a limited number of households. It is therefore necessary that this reality be addressed to minimize tension in the community.

It is important to note that it is evident that cross-linkages exists among the three broad categories of social factors discussed. Hence it is not easy to conclude that a particular set of social factors have an upper hand over the other. Of great importance is that this factors considered both in isolation as well as synergistically have a bearing on the failure or success of small irrigation schemes universally.

### 9.3 FINDINGS OF THE CASE STUDIES

In order to contextualise the issues that emerged through literature review in regard to socio-psychological, socio-economic and social and

infrastructure factors, analysis of case study schemes regarding this issues is carried out in this portion. This analysis will be carried out and discussed alongside the perspective provided by the literature review.

### 9.3.1 Socio-psychological Factors

From the discussion of socio-psychological factors it is evident that a very sound social infrastructure is critical in regard to the success or failure of small irrigation schemes. The experience with regard to the influence of socio-psychological factors in the case of studies visited, confirms to what most of the literature reports on these factors. For instance in both the schemes which in this case is the Zanyokwe and Mngazi irrigation schemes there exists a culture of collective action in regard to irrigation agricultural practices. However, this could be limited to issues such as crop culture. For instance in both schemes the common crop culture is the planting of cabbage and butternuts despite other underlying factors. In regard to both schemes the culture of collective action is also different. In Zanyokwe irrigation scheme there is for instance the Zanyokwe Irrigation Trust which oversees some scheme activities whereas in the Mngazi irrigation scheme the farmers have registered a close cooperation. One other popular culture evident in both schemes is that farming is a thing of the older generation, which is supported by a small percentage of farming engagements by young people.

The issue of conflict is also common in small irrigation schemes.

As indicated in the theoretical section that the causes of conflict in irrigation schemes are multiple, it is interesting to note that in the schemes studied for case study analysis there were actual conflict situations as well as potential conflict situations. For instance in Mngazi the main source of conflict is the financial proceeds from the sale of produce as well as the generation gap.

For example the older generation are in favour of using surplus proceeds from their production to save it or expand their operations whereas the younger generation farmers (i.e. the youth) prefer distribution of proceeds among all farmers for immediate consumption.

Potential conflict situations in Mngazi might arise when farmers will be obliged to pay for water in the event Water User Associations becomes fully operational. At the moment there is a culture of non-payment of water because such institutional structures are not yet in place. Potential conflicts may not be caused by access to water as there is an

abundance of water in the Mngazi irrigation scheme, but by some of the farmers who might fail to pay money required for payment of water services.

The very same problem might arise in regard to the Zanyokwe irrigation scheme. The issue of Water User Associations has not yet filtered through and there is also a culture of non-payment in regard to water. The following tables provide opinions on water supply in Zanyokwe.

In Table 9.1 the results of the question put to the farmers of who should pay for the water is represented..

**TABLE 9.1: OPINION OF RESPONDENTS ON PAYMENTS FOR WATER SUPPLY AND RELATED SERVICE**

All participants	Those who are irrigating	Those who are irrigating a lot	None
3.6%	18.2%	78.2%	0%

Source: Research Team Data Base

Although farmers are not yet paying for water supply in Zanyokwe, the question was asked as to who should pay for water supply related services, in order to understand farmers feelings. A majority of farmers (78.2%) believe that those farmers who are irrigating a lot should pay for water services.

In a follow up question the respondents were also asked what will their situation be in regard to willingness to pay for water supply related services and to give an indication of how much they are prepared to pay. The outcome is captured in Table 9.2.

**TABLE 9.2: RESPONDENTS' WILLINGNESS TO PAY FOR WATER SUPPLY**

Not willing to pay per ha/year	Less than R100 per ha/year	R100 to R150 per ha/year	R300 per ha/year	Average of all answers per ha/year
40%	12.7%	40%	7.3%	R78.25

Source: Research Team Data Base

About 40% of respondents were very negative and not willing to pay at all. However, the majority of farmers, 60% were willing to pay for water supply related services. On average the farmers are willing to pay R78.25 cents per ha per year. Interestingly, 60% of farmers are willing to pay for water services but the question remains as to how subsistence

farmers with low productivity and low cash income can pay back for water supply.

This amount (R78) is low if compared to the current costs of water supply and infrastructure and it is obvious that the farmers have no sense of the actual costs involved. It is important to note that small-scale farmers are not used to pay for cost recovery of the scheme. The government used to provide free services for them and this proved to be costly for the government alone. These farmers are expected to pay for recovering the costs incurred.

The issue of gender disparities in regard to the working of land and access to land is not that prevalent in both schemes, which is also a factor, which at times can trigger conflicts.

Situations are encountered whereby one by virtue of belonging to a particular political party will be against any form of infrastructure development that is suggested by farmers belonging to an opposing political party even though there is merit to that development. Interesting to note in one of the schemes visited farmers from a particular faction were in favour of centre pivot irrigation system whereas those aligned to the opposing political party were in favour of furrow irrigation.

Lastly, the perceived problems which were characteristic of small scale irrigation farmers in the past as cited in literature such as water supply and water quality are not prevalent in the case studies. Water supply assurance levels are very good in the areas where case studies are situated. The only problems, although not severe that are prevalent are that some irrigation systems are still in the state of disrepair and crop theft is still an occurrence.

### 9.3.2 Socio-economic Factors

As already stated many of the schemes were or would be established in areas where poverty is rife. In many of the black rural areas the number of females exceeds that of males. In the Eastern Cape rural areas the women population is estimated to make up to 60% of the population in some districts. Very often a large number of the males are either pensioners or disabled. Also with the onset of Aids family structures are under pressure and are the financial position of many of the households insecure.

Household income and expenditure is a crucial factor as identified in the case studies. Firstly income and expenditure is a measure of relative

well-being and secondly it illustrates the degree of dependence on local farm and non-farm resources.

Important to note is that household incomes of people located in the case studies are very low. Hence households consume irrigation produce and leave little to sell for a profit.

Many of the small-scale irrigation schemes in the case studies show very little if any profit. To support the above-mentioned statements an analysis of socio-economic characteristics of sampled, households in Zanyokwe is provided.

Household characteristics in general provide a more detailed insight into the scheme members. In Table 9.3 an descriptive information on Zanyokwe Irrigation Scheme is provided.

**TABLE 9.3: SUMMARY OF DESCRIPTIVE INFORMATION ON ZANYOKWE IRRIGATION SCHEME**

<b>Average age of beneficiaries in years</b>	52.7 (10.84)
<b>% of female headed households</b>	9%
<b>% of male headed households</b>	91%
<b>Average household size</b>	4.8 (1.45)
<b>Average land size (ha)</b>	4.7 (2.42)
<b>% of farmers using loans</b>	81.7%
<b>% of farming farmers</b>	81.7%
<b>Marketing channel</b>	Hawkers

Note: Mean values with standard deviations in brackets.

Source: Research Team Data Base

The table above indicates that the majority of the respondents (80%) believe that they are farming and are using loans from the government in the form of soft loans. Most of the products available for sale are marketed through hawkers. The hawker plays an immense role in this regard by organising sales and distribution and exposing goods for sale. They link the farmer on one hand and the consumer on the other in the distributive sector of marketing.

It has been reported that access to credit, has been a major constraint to the Zanyokwe irrigation scheme for the past few years after the

parastatal left the scheme. The major problem is the lack or absences of suitable collateral against which a loan from the bank may be bonded. This is because of the lack of title deeds for the land used for farming. But recently the department of agriculture in the Eastern Cape Province assisted by Uvimba development bank developed a strategy of financing the small-scale farmer especially Zanyokwe irrigation scheme at a low interest rate for production inputs..

In Table 9.4 below the age group and different categories of farmers are presented

**TABLE 9.4: SOCIO-ECONOMIC FEATURES AS PER OCCUPATIONAL STATUS**

	<b>Retired/pensioner</b>	<b>Full-time farmers</b>	<b>Part-time farmers</b>
Size of household	4.8 (1.41)	4.7 (1.39)	4 (1.41)
Age of households (head)	63 (9.33)	50 (7.50)	49 (19.79)
Years of settlement	12 (6.44)	9.8 (5.45)	2 (0)
Land size (ha)	4.9 (2.90)	4.68 (2.07)	2 (0)

Note: Average values with standard deviation in brackets.

Source: Research Team Data Base

All households' members were asked to record their occupational status, given that all households were farming. The households were classified based on sources of income. The main categories identified were full-time farmers, retired/pensioner and part-time farmers. Isolating these three dominant livelihood occupations highlights differences between the groups of farmer households. Full-time farmer's households are dominating the scheme. Old age pension farmers have bigger land size as compared to full time and part time farmers. It is also observed that years of settlement and size of household are higher in the case of retired/pensioners than the full-time and part-time farmers.

In Table 9.5 the socio-economic features of the farmers at Zanyokwe are presented.

**TABLE 9.5: SOCIO-ECONOMIC FEATURES AS PER EDUCATION STATUS**

	Grade 1-6	Grade 7-9	Grade 10-12	Certification
<b>Size of household</b>	4.8 (1.45)	4.5 (1.27)	5.6 (1.8)	4.2 (1.30)
<b>Age of household (head)</b>	56.42 (9.43)	47.85 (8.54)	45 (12.98)	47.4 (13.72)
<b>Years of settlements</b>	9.94 (5.7)	8.69 (6.81)	7.8 (4.66)	4.6 (3.7)
<b>Size of land</b>	4.65 (2.38)	4.55 (1.74)	3.54 (2.56)	6.3 (3.67)

Note: Average values with standard deviation in brackets.

Source: Research Team Data Base

Most of the farmers interviewed have a schooling level between grade one and six which constitutes 58% of the group. The level of education of house hold heads and house hold members in general affects household' livelihood in various ways. It is accepted that between grades 1 to 6 in South Africa, is where a person can read, and write and is considered a literate person. Previous study's indicated that a farmer's low level of education can significantly affect the farmer's capability of adopting new technology. Being illiterate effects his self esteem, which affects training programs and transformation negatively.

In Table 9.6 the socio-economic features of the farmers are presented in terms of gender.

TABLE 9.6: SOCIO-ECONOMIC FEATURES AS PER GENDER

	Male headed	Female headed	Pension
Size of household	4.86 (1.42)	4 (0)	4.55 (1.69)
Age of household (head)	50.64 (9.15)	44.5 (0.71)	62.18 (12.7)
Years in settlement	8.81 (5.46)	2 (1.41)	11 (6.75)
Size of land	4.8 (2.29)	3.05 (2.19)	4.77 (3.01)

Note: Average values with standard deviation in brackets.

Source: Research Team Data Base

As indicated in the Table 9.6 female-headed household have smaller sized farms, household sizes are smaller and they have also only settled in recent years. It was established that 91% of the farmers in Zanyokwe are male-headed household.. Male-headed household means, the male or husband plays a dominant role in decision making in the household. Male-headed households are characterized by larger sized households and they also farms the most hectares. Exceptions occur when the husband is deceased; in that case the wife assumes the responsibility of decision-maker. Pensioner household are, by definition, headed by an adult receiving the state old age remittance (R740,00 per month, 2003). The qualification of pension is based on women 60 years and men over 65 years. These households record the highest number of years settled in the scheme.

Low productivity in Zanyokwe for instance has the potential to exacerbate poverty. Rapid agricultural growth is essential for rapid reduction in incidence of poverty. On the other hand in agricultural society, without land one is poor. And when a larger mass is poor, there is no scope for off-farm opportunities. Hence poverty cycle can be broken by giving access to land. Thus land policies and laws need to be formulated and implemented within the broader context of a coherent and comprehensive policy and institutional environment geared towards agricultural development, food security and poverty reduction. In Mngazi for instance there exist huge potential for Agri-Tourism, if the farmers could get their act together this could even provide positive spin offs for them and it could also improve there income.

Another issue that has a bearing on increasing poverty is HIV/AIDS.

According to MAP (2000) the progression between 1998 and 2000 of prevalence rates of HIV infection in the Eastern Cape are as shown in Table 9.7:

**TABLE 9.7: HIV/AIDS PREVALENCE RATES (%), 1998 AND 2000**

Area	1998	2000
Eastern Cape	15,9	20,2

Source: Department of Health, 2000.

The economic impact of HIV/AIDS is generally characterised in the form of a reduced household income and an increased expenditure usually to health related expenses. A common pattern around the impact of HIV/AIDS on poor households begins with the disease the resources of the person living with AIDS.

A further economic impact experienced by some households that compounded the crisis of HIV/AIDS was cultural practice. It has been well documented that women play a significant role in agricultural production and as contributors to the household livelihood strategy. Widows, however, are not allowed to work on their agricultural land for six months following the death of their husbands as this period is traditionally reserved for mourning.

An issue closely related to the above is that of the reduced capacity of a household to effectively utilise their assets within their livelihood strategies. This capacity is undermined as a result of a household having to care for a diseased person, which increases the likelihood that productive assets would be sold. The most notable assets that are normally sold are livestock, in particular cattle and goats. The proceeds from these sales are largely utilised for medical purposes and funeral costs. The sale of such assets affects the ability of such households to utilise land-based livelihood strategies. The indirect costs of taking care of sick household members are reduced labour inputs, which diminish the quantity and quality of household produce, such as vegetables.

With regard to the two case study sites researched the issue of AIDS was not given attention. However, it might be having an impact on a wide range of issues relating to the failure of small irrigation schemes especially levels of productivity and the increase of poverty.

### **9.3.3 Social and Physical Factors**

Social and physical factors also play an important role in regard to the success or failure of small irrigation schemes. With regard to Zanyokwe

irrigation scheme the following problems were faced by farmers, according to interviews held with the people on the ground.

**TABLE 9.8: PROBLEMS FACED BY ZANYOKWE FARMERS**

Lack of water	Lack of equipment (pipes)	Lack of machinery (tractors)	Lack of capital	Poor infrastructure (roads)
25.5%	9.1%	32.7%	23.6%	9.1%

Note: % of answers given by all interviews.

Source: Research Team Data Base

Respondents were also asked to list and rank the problems they perceive with regard to their farming activities in Zanyokwe irrigation scheme. The table above indicate that the majority of beneficiaries, 32.7% have a problem of getting tractors at the time they want to plough. They mentioned that tractors are so scarce. They have to be in a waiting list for a long time. The respondents mentioned that water availability is also a problem. This is due to the closure of electric pumps by Eskom since the farmers fail to pay the electric charges and not a shortage of water.

The Zanyokwe Agricultural Development Trust's buildings i.e. workshops and administration offices, are currently in a state of disrepair. Doors are broken down, walls defaced and windows smashed. Office equipment and stationery have been stolen. After the withdrawal of support and the collapse of the scheme, no more care taking or guarding service took place.

In Zanyokwe, irrigation infrastructures are currently rehabilitated. However, some parts of the scheme do not receive adequate water, owing to equipment deterioration. A lot still needs to be done on infrastructures (irrigation and water conveyance, and the renovation of buildings). The Department of Water Affairs and Forestry as well as the Department of Public Works are busy with rehabilitation works.

One important finding at both Mngazi and Zanyokwe irrigation scheme is a lack of a comprehensive strategy for capacity building and training. This situation is worse in Zanyokwe and could be attributed to the fact that the relationship between the farmers and the extension officers, who is suppose to facilitate such programmes are not good. The importance of capacity building and training should not be underestimated, especially in the wake of BEE initiatives currently underway regarding

the Agricultural Sector. It is of great importance that beneficiaries are empowered in all respects to ensure the success and sustainability of small irrigation schemes. However, one could also state that educational and health services are not in a crisis situation. In the schemes visited the issue of child labour was not common. This is usually attributed to lack of educational facilities were children end up working on farms.

At some of the schemes the former parastatals have left behind a huge amount of infrastructure that is falling more and more in disrepair. It will require a paradigm shift from the farmers so that they can accept responsibility for the repair and maintenance of the infrastructure. The level of farmer participation must also be dramatically increased so that they can accept responsibility for the management of the schemes.

Important to note is the fact that the farmers objectives with regarded to these schemes has also shifted to producing goods that they are able to sell to boost household income rather than only to improve their livelihood.

#### **9.4 THE INFLUENCE OF LAND TENURE ON SOCIAL FACTORS**

As already mentioned in the introductory stages of this chapter, how land tenure impact upon social issues is in line with the basic model around which the methodology used in approaching this project. This model places land tenure at the hub and in so doing requires interactions between various sub-systems to continually refer back to land tenure issue. This method is followed in order to ensure that the focus of the research remains with land tenure, and that the whole inter-action with social and other issues which have formed the core of the development of many SISs does not blur the aim of the research.. In this portion the influence of land tenure on social factors will be examined, with attention focussing mainly on socio-psychological, socio-economic and social and physical factors.

##### **9.4.1 Land tenure and Socio-psychological Factors**

In regard to socio-psychological factors, the impact of land tenure will be discussed in relation to three main issues, viz.:

- Culture;
- Conflict; and
- Gender.

It is also important to note that the main focus will be on the impact of freehold tenure system as well as of communal tenure system. A

perspective will also be provided of the middle ground tenure system which in this case refer to the Quitrent tenure system.

#### Land Tenure and Culture

It is important to note that land is a deeply embedded part of the culture of a community's identity. Giving people rights over where they live and the right to access land is very important. Landownership on the other hand comes with such powerful set of cultural expectations. The cultural significance of land holding to rural people need to be explored. For instance the issue of inheritance which is a deeply rooted cultural norm, need to be looked into. The following can act as an example:- land of deceased parents are inherited by their children. This effectively entitles orphans to hold the land as they deem fit. However, in many instances it is clear that when members of the extended family joins such households and assume authority over children, their rights to land becomes threatened. In some instance it is apparent that some relatives arrive at the orphan's households with the motive of dispossessing them. This is generally common under communal land tenure system. Under freehold the owner's of land are accorded full ownership and it won't be easy to dispossess land. Furthermore in relation to inheritance, under communal land tenure system the issue of succession still discriminates on the ground of gender since it is exclusive to males. Most customary inheritance laws try to ensure that family and clan lands remain within the control of the lineage. Thus, they commonly seek to prevent alienation of land to third parties. The most common inheritance systems in Africa are patrilineal, whereby succession and inheritance of property are determined through the male line, and normally only sons or other males inherit land from the family estate. Daughters are prevented from inheriting family land. This is explained by the fact that, on marriage, young women go to live in the house of their husband and become part of another family. If her children were allowed to inherit land form her natal family, it is argued that there is a risk that the strong community links with the land would become fragmented and weakened. However, the danger that land might be inherited by an individual not interested in farming is universal, irrespective of whether it is communal, freehold or quitrent tenure system. Under communal tenure system, farmers are normally not certain about their security of the land, especially when it comes to the issue of inheritance. Of great importance is that a freehold tenure system offers individuals freedom of choice in contrast to communal tenure system. The communal tenure system also encourages collectivism among farmers which also offers a solid support system, but on the other hand it instils a dependency

syndrome among individual farmers. Hence it is important not to overlook the issues stated above as they also bred uncertainty, which could in turn translate into low farming morale and low productivity.

#### Land tenure and conflict

Land issues provide a major source of conflict in rural societies around the world. Feuds between families, neighbours and adjoining communities frequently can be traced back to conflicting claims of inheritance, boundaries and rights. Land issues play a fundamental role in economic rehabilitation. Managing such issues in an effective manner is not only important to avoiding disenfranchisement of local populations from land rights, a primary factor contributing to instability, but also to secure re-engagement of populations in familiar land uses and the resulting agricultural production and food security.

One of the weak points of communal tenures system is that it poses a difficulty to sort out land rights. However, the freehold tenure system due to it being more defined and recognisable by government provide a structure to sort out rights, the main reason being freehold tenure systems are not providing legality nightmares. The quitrent tenure system also has potential for triggering instability, given the fact that a grantee of a quitrent title pays annual rent. The grantor of the Quitrent might decide to charge an exorbitant amount as he deem fit and this might not be accepted by the grantee.

#### Land tenure and gender

Socio-economic and socio-cultural norms and institutional arrangements accentuate women's inequality of access to land, thereby indirectly encouraging high fertility. For instance, the fact that land title and land tenure tend to be vested in men may be a legal condition, but it also reflects socio-cultural tradition. In certain countries, daughters usually waive their land rights in favour of their brothers, to avoid being denounced as "selfish", and risk being alienated from their natal families. This often results in social pressure for women to bear as many sons as possible, as this can be their only means of security of access to land.

On the other hand, most customary inheritance laws try to ensure that family and clan lands remain within the control of the lineage. Thus, they commonly seek to prevent alienation of land to third parties. The most common inheritance systems in Africa are patrilineal, whereby succession and inheritance of property are determined through the male line, and normally only sons or other males inherit land from the family estate.

Thus in some cases even if women have access to land, their security of tenure is often precarious. The culture of suppression is widespread under communal tenure system. With regard to freehold tenure system women are able to escape such menace. Under the quitrent system given the fact that the grantor of the quitrent has an incentive to give any individual access to land irrespective of gender, due to the fact that the grantor receives rent payments, the access to land is not a problem. However, the security of tenure can still be precarious.

#### 9.4.2 Land tenure and Socio-economic Factors

Land tenure patterns have a bearing on socio-economic issues related to small irrigation schemes. In this instance the influence of land tenure on socio-economic factors will be discussed along the issues of poverty and HIV/AIDS:

##### Land tenure and poverty

Land is a principal source of income and employment for majority of households in rural communities. Hence the issue of secure access to land is a central issue for rural development. It is of utmost importance to incorporate land issues into Poverty Reduction Strategies. For instance the strategies must link land issues with land productivity concerns and poverty driven by inadequate land access, tenure insecurity and inability to use land effectively. Communal tenure system encourages collectivism and better support system especially for the poorest of the poor. However one can ask on the other hand as to whether can or will group ownership schemes provide easy entry and exit for members, adequate incentives for individual investment, secure incentives for capital accumulation, increased access to long-term financial capital through use of land as an collateral.

It is only in freehold tenure system that issues such as using land for collateral to access capital are not a constraint. On the other hand in the freehold tenure system. land markets play an important role in providing a source of income, facilitating intergenerational transfers of wealth, enabling access to housing and livelihoods (farming or small-scale enterprise) and in certain cases the means for securing long-term debt. However, in regard to the latter statement, it is only true only to the application of the freehold tenure system. The communal and quitrent tenure system due to tenure insecurity cannot provide for a robust rental market. Land markets under these two tenure systems will always be fraught with uncertainty.

Land tenure and HIV/AIDS

Given the importance of the HIV/AIDS epidemic in many African countries and the major implications this has for land tenure, land policies taking into account the specific needs of HIV/AIDS affected households must be developed.

According to Drimie (2002) many customary tenure systems provide little tenure security to women on the death of their husband as land falls back to the husband's lineage

HIV/AIDS not only affects the productivity of the infected, but also pulls labour of the household and extended family away from other productive and reproductive activities as others take care of the sick. Savings are consumed. Assets are sold to help pay for medical expenses. Farm-land utilization declines as inputs become unaffordable, household labour supply is reduced, and dissipating wealth makes hiring labour difficult. Sooner or later, households fall below the social and economic threshold of "survivability" leaving the survivors – mainly the young and elderly – with limited resources to quickly regain sustainable livelihood.

What then is the implication for land tenure? Land uses, according to Drimie (2002), shift to less labour-intensive uses; in some cases land is left fallow or abandoned. As noted by Drimie, infected households in South Africa used sharecropping arrangements as a means to raise cash, share output, or to avoid land under utilization or abandonment that might result in repossession. Children of HIV/AIDS affected families suffer from poverty in the short run and risk losing their future inheritance if land is taken away by traditional authorities or the state due to abandonment or under utilization. Households need assurance that they will not be evicted as farm workers because of illness, or if land is held, that their land ownership is secure. Informal land markets have allowed households to sell land in some situations. However, forced removals of widows from land and property grabbing are significant concerns.

The menace of the issues raised above are universal in relation to whatever tenure system. However, issues such as land evictions and land seizures due to underutilisation or non-utilization of land can have much impact under communal and quitrent tenure system. Under freehold tenure system the tenure rights of individuals are more secure especially in regard to inheritance issue. Evictions and Repossession would not take place under freehold tenure system.

### 9.4.3 Land tenure and Socio-physical Factors

As already mentioned land tenure arrangements has an impact on secure incentives for capital investment. Under freehold tenure system, tenure rights are secure and long-term capital acquisition and investment can be made through use of land as collateral unlike in the case of communal and quitrent tenure systems. It is important to note that rehabilitation and investment in physical infrastructure can help achieve the following objectives:

- To increase agricultural production for food security and income
- To increase agricultural employment

Small irrigation projects, in the long run, aim to improve the living conditions of people in the project area, particularly in terms of nutrition, health and economic empowerment. To complement or maximize the benefits brought by irrigation facilities, government need to improve the health and education level of communities. Especially in communal land settlement patterns, due to historical reasons people did not have access to better health and education facilities in rural communities. However, currently the government is giving attention to such issues. The current initiative of BEE in the Agricultural sector must also be accompanied by a comprehensive education and capacity building program, especially in small irrigation schemes.

### 9.5 SUMMARY AND CONCLUSION

It is very difficult to conclude which one of the social issues have a profound impact on land tenure or *vice-versa*. One thing that emerged very clearly is that there exist a causal relationship between land tenure and social issues. On the other hand the social issues also have an impact on other issues such as production, management irrigation marketing etc. which are discussed in separate chapters. As already mentioned, social issues are widespread, in this study only socio-psychological, socio-economic and social and physical factors were considered as they have a major impact on the viability and sustainability of SISs.

One issue that is very profound from the social issues discussed is HIV/AIDS. Its impact is very profound and its ramifications permeates and affects issues such as poverty, gender, productivity etc. It would be interesting that future research should be conducted in the case studies in the Eastern Cape regarding the impact of HIV/AIDS. The social issues discussed are also intertwined as it is evident in this chapter that some of the social issues overlap. Hence this issues cannot be dealt

with in isolation. This would also imply that a comprehensive and very robust strategy should be put in place to tackle social issues as well. Two other important aspect that would require immediate attention in the priority list is physical infrastructure and capacity building and training. Physical infrastructure in the form of roads should get immediate attention as they are in a bad state and they impact negatively in regarded to accessing the market, especially in Zanyokwe irrigation scheme. The issue of capacity building and training should be high on the priority list. Currently the Agriculture sector is pursuing BEE initiatives and those initiatives will not achieve intended results if a comprehensive education program as well as capacity building and training program is not put in place.

In the next section the matrix will be completed to determine the influence and importance of Social Factors on the other factors playing a role in the success of a SIS.

- **Social on land tenure** – the rural population's social and community structure do influence the tenure system strongly and a 2 is allocated.
- **Social on production** – the social structure definitely influence's production and a 2 is allocated.
- **Social on marketing** – social structures can influence the marketing option and a 1 is awarded.
- **Social on irrigation** – influence of social factors on irrigation is low and 0 is allocated.
- **Social on finance** – the strong community bonds seems to frighten of the private financial groups and a 2 is awarded.
- **Social on management arrangements** – the social structure influence's the management options available for SIS and a 1 is awarded.

A total of 8 out of a maximum of 18 is awarded to social which indicates a relatively strong interaction between social factors and the other factors analysed.

FIGURE 9.1: SOCIAL MATRIX

	land tenure	production	marketing	irrigation	financing	institutional	social	all	definitions
land tenure	-	-	-	-	-	-	-	-	- freehold, quitrent, communal, trust, leased
production	-	-	-	-	-	-	-	-	- quantity and quality of output, crop selection
marketing	-	-	-	-	-	-	-	-	- effectiveness in reaching markets
irrigation	-	-	-	-	-	-	-	-	- adequate water, appropriate irrigation systems
financing	-	-	-	-	-	-	-	-	- access to, and effective management of, finance
institutional	-	-	-	-	-	-	-	-	- WUAs, CMAs, CPAs, Acts, management
social	2	2	1	0	2	1	0	8	- Community attitudes, skills bases, level of training
all	-	-	-	-	-	-	-	-	

NOTE: All impacts are row upon column

**PART THREE**

## 10 SYNTHESIS OF FINDINGS

by C.J. Williams

The reader will have realised by this stage that our research has revealed a large number of inter-related issues surrounding the viability of small-scale irrigation schemes in the study area. In this Chapter an attempt is made to put these in context by quantifying the results and presenting them in matrix format as outlined in Chapter 3. Before doing that, and in order to refresh our view of the changing environment with which we are faced, it is appropriate to review the history of SISs in South Africa.

### 10.1 A BRIEF RECAPITULATION

**Then .....**

In the first place, it is clear that many of the current problems are derived directly from the apartheid policy that excluded black people from owning or renting land outside the 14 percent of the country delineated as reserves (the former Homelands). Land was mostly state-owned, and usage was granted through traditional authorities and regulations. These areas were typically poor rural areas, where many people lived under conditions of deprivation as harsh as elsewhere in poorer African countries.

Preliminary surveys estimated that the irrigation potential of the Homelands was about 54000 ha, sufficient to settle 36000 families, and schemes were accordingly developed during the late 1950s and 1960s. During the 1970s, these Homelands were encouraged to become independent on a political and administrative level, resulting in the withdrawal of central government, and homelands' administrations taking over.

From the outset and throughout these times, small-scale irrigation within the Homelands was only meant for local food supply, with no market environment or support system in place to promote any form of commercialisation whatsoever (Tomlinson, 1955).

**And now .....**

Since 1994, the South African Government has undertaken massive reforms aiming to address rural poverty and inequalities inherited from the past apartheid regime. Amongst other programs,

it has adopted an ambitious new water legislation that promotes equity, sustainability, representivity and efficiency through water management decentralization, new local and regional institutions, water users' registration and licensing, all of which bring additional cost to the users of water.

With this profound change in emphasis it is hardly surprising to find that many schemes set up in the apartheid era are struggling to come to grips with this new reality. The objective of this chapter is to contextualise findings of the research in this changing environment, and to help understand the situation of SISs in South Africa.

## **10.2 SOCIAL AND ECONOMIC FINDINGS**

This Section firstly presents the conclusions derived at in Chapters 4 and 6 to 9 in summarised form, then brings these together in order to highlight the most critical issues and impacts.

### **10.2.1 Land Tenure**

The two tenure systems currently most practised are freehold and communal. Many communities have opted for CPA to manage their operations. These have not been uniformly successful. In many instances dysfunctional groups were formed that are very difficult to manage, resulting in difficulties in securing long-term finance.

In the case of SISs on communal land individual ownership was in many cases not an option and the scheme was seen as an extension of the communities' activities as regulated by the community structures. In most of the schemes this led to the situation that the schemes were not perceived to be commercial entities that were to become economically sustainable. However, the CLRA has the potential to change the situation and it could become the instrument to bring stability to the tenure situation on the schemes.

Cognisance must be taken of the traditions and wishes of the local people, but simultaneously they must also understand the possible limitations of the option that they have chosen and the possible consequences that might follow.

### **10.2.2 Production, Marketing and Irrigation**

The Zanyokwe Irrigation Scheme at Keiskammahoek and the Mngazi Irrigation Scheme at Port St Johns present two interesting contrasts. Zanyokwe is old, beset with problems, has poor access to markets and is unsuccessful. Mngazi is new, functions fairly well, has easy access to

markets and is relatively successful, despite the fact that the farms are still not able to provide the farmers with sufficient income.

One of the most pressing current problems at both Zanyokwe and Mngazi is to increase production to acceptable levels. By improving the managerial and production competence of the farmers, can contribute to solve this problem. However, it is also necessary at Zanyokwe to get the farmers to accept responsibility for their decisions, and a contribution to this would be to rationalise the current diversity of tenure systems.

At Mngazi it appears as if the present leadership is acting responsibly and has the support of the farmers. However, they would over time have to address the question of outside finance, individual skills development and ambitions and formal marketing structures. The present communal farming practised dictates a group marketing structure, should production increase more formal marketing channels will have to be developed.

Production, marketing and irrigation technology are inter-linked and also affected by tenure arrangements. Proper application of irrigation technology will improve production; increased production will affect marketing. Tenure arrangements can effect the selection of irrigation technology while *vice versa* irrigation technology can influence the tenure option.

### 10.2.3 Financing

Many of the schemes reviewed have at some time in the past had access to loan finance, but inability to sustain loan repayments has always been a problem depending on adequate gross margins.

An issue that stood out clearly was the level of farmer training. Many claimed to be adequately trained, but there was evidence that their financial management skills, for example, were not adequate.

The attitude of loan providers is that their role is to select creditworthy clients and hold them to their repayment obligations. The fact that small-scale farmers frequently do not have the skills to carry this through successfully underlines the critical need for appropriate training in financial management.

In terms of the long-term viability of the schemes researched, attention needs to be paid both to farmers' ability to access credit and their ability to service credit once obtained, and it must be ensured that adequate training is available.

#### 10.2.4 Institutional, Organisational and Management

These issues were divided into "on-farm" and "off-farm" issues. With regard to "off-farm" management of water supply, small-scale irrigation farmers will need to play a central role in managing their WUAs. There is evidence that small-scale irrigation farmers are not as yet ready to play this role effectively.

As regards "on-farm" management, small-scale irrigation farmers are now obliged to take full responsibility for managing the financing and operations of their farms, as well as the marketing of their produce. The case studies indicate that farmers are struggling to survive as they do not have the level of expertise to function independently, and are still very much dependent on effective extension services for finance, advice and support.

In terms of land tenure options, land ownership status was not seen as a significant influencing factor at this level.

As regards "on-farm" management, land ownership status is likely to be a more significant issue. Farming experience in South Africa, both dry land and irrigation farming, suggests that freehold farming is more successful than communal farming. However, this differentiation may actually have less to do with land ownership status, and more to do with the level and quality of support given to farmers.

As regards small-scale irrigation farming, these (mostly black) communal farmers were, in the past, in fact nothing more than labourers, working on SIS that were financed, established and operated by government departments. To the extent that this assessment is valid, land ownership status for small-scale irrigation farmers is not likely to be a significant factor in their survival. Rather, the availability and quality of the financial, operational and marketing support they receive is likely to be a far more important factor.

#### 10.2.5 Social Factors

It is very difficult to conclude which of the social issues has the most profound impact on land tenure or *vice-versa*. One aspect that does emerge is that there exists a causal relationship between land tenure and social issues. Social issues also have an impact on other issues such as production, management irrigation marketing etc.

One issue that cannot be overlooked amongst the social issues discussed is HIV/AIDS. Its impact is very profound and its ramifications

widespread. It affects issues such as poverty, gender, productivity and many others.

Two other areas which have notable impacts are physical infrastructure, and capacity building and training. Physical infrastructure, in the form of lack of roads, impacts negatively on production and market access, especially in the case of the Zanyokwe Irrigation Scheme. Both capacity building and training have notably pervasive impacts. Currently the Agriculture Sector is pursuing BEE initiatives and those initiatives cannot achieve intended results if a comprehensive education program as well as capacity building and training program is not put in place.

#### **10.2.6 Summary of Impacts**

It is clear from the discussion above that there are many cross-linked impacts between the various systems. For example, finance can be said to have a significant impact on production (short-term production finance), and a moderate impact on irrigation systems (ability to upgrade and maintain). By the same token, other systems such as production, land tenure, social, institutions and organisations each have an impact on the ability to attract and service finance.

It is difficult (as well as being impractical) to try to pinpoint any one system as making a prime contribution to the success or failure of the schemes studied, but the use of such a matrix does highlight what the impacts of one system is upon another. With this in mind, the various impacts were graded in severity by the project team, as described in the concluding section of each of the chapters dealing with these impacts, and entered into the matrix.

	land tenure	production	marketing	irrigation	financing	institutional	social	all	definitions
land tenure	0	2	1	1	3	1	3	11	freehold, quitrent, communal, trust, leased
production	0	0	2	1	1	0	1	5	quantity and quality of output, crop selection
marketing	0	1	0	0	1	1	0	3	effectiveness in reaching markets
irrigation	1	3	0	0	0	1	0	5	adequate water, appropriate irrigation systems
financing	1	3	1	2	0	0	0	7	access to, and effective management of, finance
institutional	2	0	1	0	2	0	2	7	WUAs, CMAs, CPAs, Acts, management
social	2	2	1	0	2	1	0	8	Community attitudes, skills bases, level of training
all	6	11	6	4	9	4	6	46	

NOTE: All impacts are row upon column

The picture which emerged is shown below as

FIGURE 10.1: SUMMARY MATRIX OF SYSTEM-ON-SYSTEM IMPACTS

The following issues are of importance when considering the entries in the matrix:

- As indicated above, and explained in Chapter 3, the impacts presented are all row upon column. In other words any entry depicts the impact of the element in the same row upon the element in the same column.
- The final column and row headed "all" indicates the impact of all systems upon any single system and *vice versa*, once again in a row upon column manner.
- The severity of any impact is rated on a four-point scale where 0 indicates a negligible impact, 1 a minor impact, 2 a moderate impact, and 3 a significant impact.

The main contribution to be made by analysing the impacts along these lines, by ranking them according to their aggregate impacts, is an overall picture of which systems exert the greatest impacts on the structure and effectiveness of SISs.

The two most immediate observations which can be made relating to the matrix are the impacts relating to land tenure and to production. Land tenure will be seen to have an influence to a greater or lesser extent on all the other systems under consideration, and as such has the highest rating in the matrix. The system most heavily impacted upon by land tenure systems in operation is clearly finance, and this is an issue which comes through clearly in the chapter on finance, particularly with reference to the case studies. In the light of the enabling acts now in

place surrounding the issue of land rights, there is potential for considerable reform both in terms of existing and new SISs.

Looking at the system which is most heavily impacting on the aggregate effects of all the other systems (last row of the matrix) is social factors. This finding underpins the fact that social factors are very important factors of successful SISs. This is to a large extent due to the issue of training and education being included in this topic. In visiting the case study SISs, the research team was continually made aware of the need for training, particularly in the farm management areas. However the social and community structures of the rural community will for a long time play a very important role in SIS's.

Looking at the factor which is most heavily impacted upon by the aggregate effects of all the other systems (second column of the matrix) is production. This finding underpins the fact that production is a very important kingpin of successful SISs, without production there can be no profits and no growth.

Whilst, as stressed in Chapter 3, this method is not definitive, it presents an ordered picture of how the many systems interact. The important issues to take note of in this respect are that land tenure and social issues provide the greatest impacts on other systems, whilst production and financing are themselves most impacted upon by other systems.

### 10.3 CONCLUSIONS

The use of a System-on-System matrix to rank the impacts of various systems has highlighted the importance of land tenure and production in the ongoing viability of SISs, and supports, in a quantitative manner, the hypothesis that *land tenure and support structures have an effect on the long-term viability of Small Irrigation Schemes*. Attention is also drawn to the need for education and training. It can be said that true BEE cannot be brought about simply through appropriate institutions, and the making of resources available for the purpose. Full empowerment can only become a reality when people are empowered to use resources effectively for their own betterment.

We have noted that our findings apply equally to rehabilitating existing schemes and to establishing new schemes. In the next Chapter we will describe how a framework for analysing the dynamics of change associated with SISs was developed as the project progressed, its relevance to the case study schemes, and its use in studying the establishment and development of SISs.

## 11 CONCLUSIONS AND RECOMMENDATIONS

by C.J. Williams

### 11.1 INTRODUCTION

The research up to this point concentrated on investigating the static situation vis-à-vis existing developments, without paying much attention to the dynamics of development.

In the process of synthesising the findings of the preceding chapters and developing the matrix it became clear that two major issues are driving the process at the moment, namely the size of farms, and the degree of support available to farmers.

#### 11.1.1 Analysing the Dynamics of Change

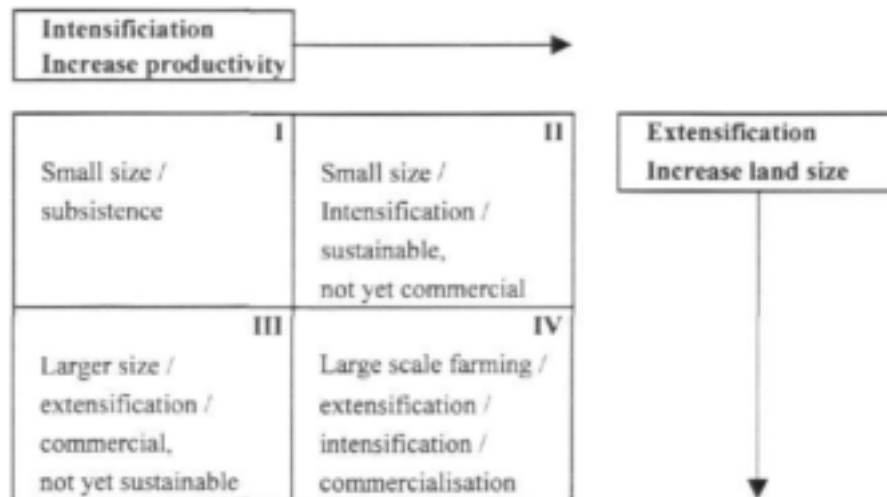
It was decided to use these issues as the underpinnings for developing an analytical framework to explore the dynamics of existing and proposed schemes. In the discussion which follows, these issues are referred to as extensification (increasing land size) and intensification (increasing production efficiency).

Other factors which were also taken into account are:

- The institutional issues which are mainly driven by the government's ideal of attaining both equity and economic viability, as components of sustainable development. The intention is to attain equity by using the black economic empowerment vehicle but simultaneously ensuring that the irrigation enterprises (i.e. the schemes) are economically viable.
- The social and economic issues which will be affected by community perceptions and traditions of the rural populations and will vary between commercial enterprises and various degrees of subsistence units. Also of importance is the motivation of farmers to become economically viable.

Figure 11.1 brings these issues together and provides a compact framework within which development dynamics can be discussed. In addition some additional underpinnings of the framework are considered in more detail below before working through the ramifications of moving through the framework.

FIGURE 11. : AN ANALYTICAL FRAMEWORK



#### Intensification and Extensification

Whilst being fundamental to the understanding of the analytical framework, intensification and extensification are very straightforward concepts. Intensification is a term which implies the use of techniques (and technology) to increase the output from a given size of land, and thereby increase the efficiency of its use. Extensification implies the use of more land to increase the output and productivity. (A lower limit of 1.3 to 1.7 ha being regarded as a minimum size for sustainable irrigation agriculture as mentioned previously.)

#### Equity

The government policy is to promote equity and using Black Economic Empowerment (BEE) as the vehicle to implement the policies. During the research a number of issues and factors were identified that could be classified as equity matters namely, access to land; water resources; capital, extension and health/social services and gender issues. These issues are driven by new acts that give rise to policy directives that are responsible for some very dramatic changes in the farming environment.

#### Economic efficiency (sustainability)

The ultimate goal of the development process is not only equity but also economic efficiency that would lead to sustainable agriculture. Defining efficiency is not that clear-cut because a very large commercial farmer might be sustainable but not necessarily is an efficient user of resources. We will use the concept of economic efficiency to imply that a farmer makes the most of his opportunities and resources and is able to provide

for himself and his family, without being dependent on Government support.

Commercial vs. subsistence farming

It is necessary to capture the farmers' objectives in entering small scale farming, and these are basically either to farm at a "subsistence " level or as a commercial undertaking. Inseparable from these objectives are the underlying concepts of land availability and a community-based approach to projects, as well as the use of the most appropriate technology to achieve the results required. Implicit in the drive towards full commercial farming is the need to derive the returns to scale which would stem from increasing the size of the land being used as a factor of production.

A brief journey through the framework

A scheme (or individual farm) could sit anywhere in the space defined by the framework, depending on its efficiency and degree of commercialisation. The natural entry point into the framework is at the top left (in Sector I), with low equity and low subsistence level. This entry implies that sufficient land and water are available for subsistence farming. With suitable development, the farming enterprise could move in the direction of greater productivity, along the horizontal axis, or greater returns to scale along the vertical axis. Ultimately, the most desirable position is the bottom right (in Sector IV), with maximum commercialisation and sustainability. It should be noted that other positions within the framework are not necessarily undesirable or inappropriate – this depends upon both government and individual aspirations in any given circumstance.

The chief drivers of movement in the framework are:

- availability of land and water
- extensification and intensification, and
- availability of support systems.

At a more detailed level, exploring this framework would proceed thus:

Firstly we need to enter the framework, and then endeavour to identify and define the feasible end states. These may exhibit varying degrees of sustainability and commercialism.

We must enter the framework assuming the availability of irrigable land, water and occupants (aspirant farmers).

At the entry point, individual land allocations may be below the critical size to be viable (vide 1,3 to 1,7ha quoted earlier) and occupants may have no entrepreneurial aspirations. Very often they are where they are by happenstance rather than by desire. At this point we are in Quadrant I near the top left-hand corner.

These farmers can move towards sustainability in the intensification or the extensification directions (or both). At least some movement in the extensification direction will be necessary to achieve a "critical mass" in terms of plot size.

Some distance also needs to be travelled along the intensification route. Minimum levels of technology and other support are necessary before activities can be categorised as farming. Perhaps critical in this respect would be matching land to crops. With greater input from support structures crops can be matched to markets – a measure of viability is then seen to emerge. We are still in Quadrant I, but closer to the lower right-hand corner.

With further intensification, a greater level of viability can be approached. This would take us along the route of intensive cultivation of crops and niche markets. This could be regarded as sustainable (in that it provides a stable income) but not commercial, as without extensification there is little scope for growth. Quadrant II.

From Quadrant I we can also travel the extensification route and acquire more land to get beyond the critical mass. This will take us toward commercialism (in terms of output) but still not necessarily with stable income, and therefore not yet sustainable. Quadrant III.

#### BOX 1

##### **The role of support systems in extensification and intensification**

In general movement along the intensification axis implies development by the more efficient use of existing resources (notably water and land), whilst movement along the extensification axis implies the use of more resources (again notably land and water).

However, we must not lose sight of the fact that any movement to a higher state will make a demand on support systems. More land will probably require financing and financing will only be readily available in the presence of appropriate land rights and management structures. More land will probably mean more technology (irrigation) and infrastructure.

Similarly, a move along the intensification axis will probably also require investment in technology to obtain greater efficiency which in turn will require financing.

So whilst the objectives of moving along the two axes are different (increasing efficient use of resources vs. increasing returns to scale) the catalyst in both cases is provided by the availability of support systems.

In a fashion analogous with described above, the move from Quadrant III to Quadrant IV will be by means of intensification, and from Quadrant II to Quadrant IV by means of extensification. In both cases the end state will be sustainable commercial farming.

As will be seen from Box 1, this move into Quadrant IV, whether from Quadrant II or from Quadrant III, will require greater and more effective use of support systems. With increasing size and technology input will come the need for finance, with increasing output will come need for markets. Sustainability will call for appropriate management and infrastructure development.

From the diagram it is clear that equity could be attained without achieving economic efficiency because the enterprise could either be in the subsistence or commercial block. (Mngazi is a case in point, which is commercial, but still with a very tenuous hold on sustainability). The aim should therefore be to try and use policy tools to move prospective farmers from the subsistence block to the economically efficient blocks, either as subsistence farmers with diverse income streams or as commercial farmers.

It should be noted that the move towards greater economic efficiency generally calls for intensification, or an increase in technology input. This is especially so where the land size is small and greater output is sought without increase in size. To move down the framework towards greater commercialisation generally requires extensification using increased returns to scale to generate improved output. Movement in any direction to a higher state invariably puts an added load on most support systems, either in the form of technology, training or infrastructure development.

## 11.2 CONCLUSIONS

The relationships between land tenure and support systems comprising financing, production and marketing, irrigation, institutions and organisations and social issues have been researched in an endeavour to show that land tenure and support structures have an effect on the long-term viability of SISs.

A matrix was used to synthesise the finding of the research, and it was found that land tenure, finance, institutions and organisations, and social issues played large roles in the ongoing viability of SISs.

It was seen during the data gathering exercise that these issues are very site-specific and a generic picture of SISs did not emerge.

Towards the end of the research period it was realised that the results represented a static picture of the SISs under consideration, and that an ability to examine the dynamics of the development of SISs would be very valuable. As a result, the framework described in this chapter was developed, but it was not possible to use it as a research tool due to the advanced stage of this project. If the research team could have stated the framework upfront, the study could have taken a different route. However, the development or use of this framework presents an opportunity for fruitful further work

Thus whilst many issues have been clarified and highlighted, there still remain many unanswered questions, that could not be addressed within this project.

### 11.3 RECOMMENDATIONS

Given the site-specificity of this type of research, it is recommended that it be followed up with further research on other, possibly less researched sites.

It is recommended that the framework for dynamic analysis be developed and used to provide a tool for guiding both the establishment of future SISs and the development of existing schemes. A possible use of the framework to provide institutional recommendations based on this project is included in Appendix E.

## LITERATURE CITED

1. **Agri-Carmel (1985)**. Rural Land Use and Agricultural Production.
2. **Anim FDK & Lyne MC 1992**. The effect of land tenure on commercial livestock production in the Peddie coastal area of Ciskei. *Agrekon* 31 (4):321-327.
3. **Baber, C. (1991)**. Speech Technology in Control Room Systems: A Human Factors Perspective Chichester. Ellis Horwood Ltd.
4. **Backeberg, G. R. and Groenewald, J.A. (1995)**. Lessons form the economic history of irrigation development for smallholder settlement in South Africa, *Agrekon*, 34(4): 167-171.
5. **Backeberg, G.R. and Odendaal, P.C. (1998)**. Water for Agriculture: a future perspective. In: Proceedings of the 39<sup>th</sup> Ordinary General Meeting of the Fertilizer Society of South Africa, 24<sup>th</sup> April 1998, Sun City, South Africa. pp 49-61.
6. **Bembridge, T.J. (1985)**. Agriculture and rural development in less developed countries with special reference to southern Africa. *Development Southern Africa* 2 (2): 287-296.
7. **Bembridge, T.J. (1986)**. Problems and lessons from irrigation projects in less developed countries of Africa. *Development Southern Africa* 3(4), 600 – 618.
8. **Bembridge, T.J. (1996)** Small-scale farmer irrigation schemes in South Africa. In: Backeberg et al. Policy proposal for irrigated agriculture in South Africa. Water Research Commission Report No KV96/96?, Pretoria, SA.
9. **Bembridge, T.J., (2000)**. Guidelines for rehabilitation of small-scale farmer irrigation in South Africa, WRC Report No. 891/1/00. Pretoria.
10. **Coetzee, G. and Cross, C. (2002)**. Group approaches to financial service provision in rural South Africa: Working Paper 2002-10, Department of Agricultural Economics, Extension and Rural Development, University of Pretoria.
11. **Cohen, A.P. (1993)**. Culture as Identity. *New Literary History*, 24(1), page 29.
12. **Cotula, L. Toulmin, C. and Hess, (2004)**. Land Tenure and Administration in Africa: Lessons of Experience and Emerging Issues. FAO.
13. **Crosby, C.T., De Lange, M., Stimie, C.M., and Van Der Stop, I., (2000)**. A review on planning and design procedures applicable to small-scale farmer irrigation projects WRC. Report No. 378/2/00, Pretoria, South Africa.
14. **Cross, C.R. and Haines, R.J. (1988)**. Towards freehold?: options for land and development in South Africa's black rural areas. Juta, Kenwyn, Cape Town.
15. **Department of Agriculture (2004)**. Abstract for Agricultural Statistics, Pretoria RSA.
16. **Drimie, S. (2002)**. The impact of HIV/AIDS on Land: Case Studies from Kenya, Lesotho and South, Synthesis report prepared for the Southern African Regional Office of the Food and Agricultural Organization of the United Nations, FAO, August.

17. **Feder, M. and Feeny, G. (1991).** Management in developing countries. New York .NY: Routledge.
18. **Hill, Kaplan & Scott Consulting Engineers (1977).** Report on proposed dredging and reclamations. NC/PJH/TB/EDM/7155, pp 12, Cape Town.
19. **Hunter, N. May, J. and Padayachee, V. (2003).** Lessons for PRSP from Poverty Reduction Strategies in South Africa. Working Paper No. 39, March 2003, ISBN No 1-86840-4986.
20. **Lahiff, E. (2001)** "Land Reform in South Africa: is it meeting the challenges? Policy Brief, Programme for Land and Agrarian Studies, University of Western Cape, South Africa.
21. **Lavigne, M. and Stirer, N. (2003).** Transfert de gestion et durabilité des périmètres irrigués en agriculture familiale noire en Afrique du Sud. Unpublished Masters thesis. 170p, ENSAIA-UP-CIRAD, Montpellier, France.
22. **Lyne, M.C. and Niewoudt, W.L. (1990).** The real tragedy of the commons: Livestock production in KwaZulu. The South African Journal of Economics, Vol. 58 (1): 88-96.
23. **MAP (2000),** The Status and Trends of the HIV/AIDS Epidemics in the World XIII International AIDS Conference, 5 – 7 July, Durban South Africa.
24. **Mazibuko, G. and Pegram, G. (2004).** Evaluation of the role of water user associations in water management in South Africa. WRC Report No. TT 204/03.
25. **Mosher, J. M. et al (1971).** California Institute of Technology, Pasadena, California 91109. The American Physical Society.
26. **Mpahlele, R.E., Malakalaka T.M. and Hedden-Dunkhorst, B.et al (1999).** Characteristics of Smallholder Irrigation Farming in South Africa: A Case Study of the Avabie Olifants River Irrigation Scheme, Colombo Sri Lanka. International Water Management Institute.
27. **Muriithi, N. and Crawford, L. (2002).** Approaches to project management in Africa. Implications for International Development projects. International Journal of Project Management 21 (2003) 309-319.
28. **Ntsonto, N. (2005).** Economic performance of Small holder irrigation schemes: A case study in Zanyokwe, Eastern Cape, South Africa. U published M. INST. AGRAR theses.
29. **Perret, S. and Touchain, E. (2002).** A simulation approach to assess the economic viability of smallholding irrigation schemes in South Africa. CIRAC-Tera / University of Pretoria, No 02/02. Pretoria, South Africa.
30. **Perret, S., Lavigne, M., Stirer, N., Yokwe, S., and Dikgale, S. (2003).** The Thabina irrigation scheme in a context of rehabilitation and management transfer: Prospective analysis and local empowerment. Final report: DWAF, CIRAD-IWMI-UP, Pretoria.
31. **Rouzère, H. (2001).** L'établissement d'agences de bassin en Afrique du Sud, principes et implementation. Rapport CIRAD/CNEARC, Montpellier, France. (forthcoming).
32. **Rural Urban Consultants (2003).** A holistic approach to development and poverty reduction, ADB, September 2003.

33. **Saleth, R.M. (editor) (2002)** *Water Resources and Economic Development*. Edward Elgar Publisher, Cheltenham, UK, 527p.
34. **Saleth, R.M. & Dinar, A. (2004)** *The institutional economics of water: a cross-country analysis of institutions and performance*. The World Bank & Edward Elgar Publishers, Cheltenham, UK, 398p.
35. **Shah, T., van Koppen, B., Merrey, D., De Lange, M. Samad, M. (2000)**. *Institutional Alternatives in African Smallholder Irrigation: Lessons from International Experience in Irrigation Management Transfer*. IWMI, Draft Working paper.
36. **Strauss Commission (1996)**. *Final Report of the Commission of inquiry into the provision of rural financial services*. Strauss Commission. RP/108/199.
37. **Taylor, (1988)**. *Varieties of stabilization experience*. Oxford, Clarendon Press.
38. **Tomlinson Commission. Union of South Africa (1955)**. *Summary of the report of the Commission for Socio-Economic Development of the Bantu Areas within the Union of South Africa*. UG 61/1955, Government Printers, Pretoria, SA.
39. **Tuttan, S. (2003)**. *Land tenure and economic development in rural Southern Africa. Natural resource perspectives*, 39, Development Institute, London.
40. **Van Averbek, (1996)**. *Final Report by Task Team 2. Appointed by the Honourable MEC Sigwela of the Department of Agriculture and Land Affairs of the Eastern Cape. To advise on rationalisation of Zanyokwe Irrigation scheme*.
41. **Van Averbek, W. (1995)**. *Land reform research programme, Eastern Cape province: final synthesis report*. Agricultural and Rural Development Research Institute (ARDRI), University of Fort Hare, Alice.
42. **Van Averbek, W., M'Marete, C.K., Igodan, C.O. and Belete, A. (1998)**. *An investigation into food plot production of at irrigation schemes in the Central Eastern Cape*, ARDRI, University of Fort Hare.
43. **Van Rooyen, C.J., Vink, N., and Christodoulou N.T. (1987)**. *Access to the agricultural market for small farmers in South Africa: The farmer support programme*. Development South Africa Vol4, No.2.
44. **Van Zyl, J. Kirsten, J.F., Binswanger, H.P., (1996)**. *Agricultural land reform in South Africa Policies, Markets and Mechanisms*. Oxford University, Press, Cape Town.
45. **Yokwe, S. (2004)**. *Investigation of the economics of water as used by smallholder irrigation farmers in South Africa*. M. Inst. Agrar, Rural Development Planning and Management. University of Pretoria , South Africa, unpublished Thesis.

# **APPENDIX A**

**LITERATURE SURVEY**

## APPENDIX A: LITERATURE SURVEY

### PART I: DISCUSSION

This appendix presents a synopsis of the available literature dealing with the subject of different farm tenure systems and support structures for establishing small-scale irrigation farmers in long term viable conditions. In surveying the literature, an attempt has been made to identify all of the issues raised that are related to this subject, as well as to identify the possible solutions and recommendations that have been identified by the authors.

This appendix presents the results of the literature survey according to the same topics covered in Part II of the main report, but in the following order:

- Farm Tenure Systems
- Institutional and Organisational Arrangements
- The Influence of Social Factors
- Irrigation Schemes
- Production and Marketing
- Financing, and
- Management

Appendix 1 contains a table that reflects the key issues identified within each of these focus areas by the authors of the articles and reports reviewed in this literature survey, plus a summary of the background to these issues and the possible solutions and recommendations made by the various authors. Each of the chapters in Part II of this report will focus on the relevant issues that pertain to this investigation. As such, this appendix attempts to provide the reader with an overview of the scope of each of the above focus areas, and the critical issues effecting the long-term viability of small-scale irrigation farmers.

#### Farm Tenure Systems

There are a number of different tenure systems that can apply to farms: tribal/communally owned land, state and SA Development Trust owned land, freehold (private) and quitrent (erfpag) land. Most of the land held by black South Africans is legally held in trust by tribal authorities for the benefit of the people, while the underlying title is vested in the State. Property rights are communal, which means that individuals do not have the right to alienate their land permanently and the community has the right to revoke land allocations if the land is not used for a designated period<sup>1</sup>. Individuals are awarded exclusive rights to arable land whilst grazing land is communal and open to all households.

About 51,7 per cent of South Africa's people live in communal areas and this population is growing at a rate of over 3% a year<sup>2</sup>. The average farm is no more than two hectares, and yields are low compared with those in commercial agriculture<sup>3</sup>.

The experience of Zimbabwe suggests that land redistribution alone is unlikely to solve the problems of degradation and overcrowding<sup>4</sup>. Rural reform is not just about the redistribution of land but about the restructuring of communal areas<sup>5</sup>. Adaptive policies are preferable to policies that replace communal rights with exclusive freehold title.

Rural reform policy must take account of the link between the rural and the urban areas. Increasing the security of urban property rights will decrease population pressures in communal areas, while improving areas will help to slow population growth<sup>6</sup>. Where commercial and state land is acquired for redistribution and resettlement, preference should be given to emerging small-scale commercial farmers, who should be granted secure and legally enforceable individual title. Incorporations and trusts are able to reduce the problems encountered in undertaking collective action and allow land to move to its most productive agricultural use through the rental market.

The critical issues affecting the long-term viability of small-scale irrigation farmers, include:

- With regard to land ownership, most small-scale irrigation farmers are at the mercy of the local Headman or the government. Interested farmers cannot attain more land, and there is no incentive for uninterested farmers to "sell" the land they occupy.
- Land cannot be used as collateral for obtaining loans, and
- Women have no say in land ownership although they work the land

These factors have a number of inter-related negative impacts on small-scale irrigation farmers. Chapter 3 addresses these impacts in greater detail, along with possible solutions for dealing with these issues.

### **Institutional and Organisational Arrangements**

Institutional constraints and how they are managed are the keys to future development<sup>6</sup>. There are probably as many approaches and combinations of approaches as there are schemes. Standardisation is not possible. No matter what the final organisation that is envisaged, there will have to be a 'board of directors' who take full responsibility for the operation of the scheme. This committee must be truly representative of all concerned with the scheme and the governance of the community. There needs to be checks and balances to prevent the management being taken over by the politically or economically powerful and consequently the structure should develop on an evolutionary basis in phase with scheme development.

There are two groups of issues. Firstly the day-to-day management and physical maintenance and development of the scheme and, secondly, the effective mobilisation of all the many support services required by the community. Unless effective planning and implementation can be achieved this organisation of people can be an overwhelming constraint to further development. Essentially this has been the major stumbling block in the past. Some of the key questions that need to be addressed include:

- Can the present situation be extended/modified to cater for the initial phase of development?
- Are there signs of stress or ineffectiveness?
- Do individuals or groups dominate management?
- What role is there for the tribal institutions?
- Are their relationships with commercial farmers and/or private sector concerns that can be extended?

The most important institutional development that will affect the long-term viability of small-scale irrigation farmers is the introduction of the new National Water Act of 1998. The most critical issue revolves around the requirement that most water users will have to register and be licensed, and will have to pay for the water they use. This will present many small-scale irrigation farmers with the challenge of having to participate in the management of their Water Users Association, and having to find the money they need to pay for the water they use. This issue is dealt with in more detail in Chapter 4.

### **The Influence of Social Factors**

Social infrastructure covers religions, educational institutions and organisations, tribal and communal laws, extension, credit and financial institutions related to or involved in agricultural production<sup>7</sup>. Social considerations may exert greater influence on human behaviour than financial ones and as such, a basic knowledge of the main social factors prevailing within a community and their influence on farmers' behaviour is indispensable.

The body of irrigation research literature is relatively silent on the provision of social infrastructure by government or its parastatal institutions prior to the development of irrigation facilities. What is evident from studies investigated is that many services, especially the educationally and health related ones spring up in these communities after migration into the area has necessitated it. Some services are provided free while others are perceived to be free. In the days of Homeland administration, many communities in the Ciskei and Transkei enjoyed free services ranging from

taxation to water use and healthcare. This has, in some ways, perpetuated the continuation of a dependency syndrome and unnecessarily attracted blame from the beneficiaries to the providers for a slow process of service delivery.

In the Eastern Cape irrigation schemes, especially the ones under investigation, social services and amenities are very limited and the state and quality of service to rural communities is poor. This can be found from the physical neglect of these areas. However, there are a few government built schools and clinics and hospitals are close to nearby towns. Most of the rural areas within the radius of these schemes do not enjoy electricity and proper housing. However, the Reconstruction and Development programme intends to assist in bringing these amenities soon.

In the past, the Agriculture and Rural Development Corporation (ARDC) managed small holder irrigation schemes through an elaborate top-down command and support system, which has eventually proven unsustainable. Under a version of contract farming, irrigation to small holders was fully subsidised, and the ARDC organised mechanised cultivation, planting and fertiliser application in the schemes. It also organised the marketing of pooled produce before deducting all its expenses before turning the residual sum, such as it was, over to farmers. This parastatal's abrupt withdrawal has had a telling effect on small holders.

Household income and expenditure is a crucial variable in two respects. Firstly, income and expenditure is a measure of relative well being and, secondly, it illustrates the degree of dependence on local farm and non-farm resources. Many small-scale irrigation schemes show very little or no profit. As a result, most household incomes are low and households consume their irrigation produce and little is left over to sell for a profit.

The critical issue affecting the long-term viability of small-scale irrigation farmers will be enabling these communities to create economically viable, farm-based structures that are capable of sustaining community life. Chapter 5 addresses this issue in more detail.

### **Irrigation Systems**

The literature identifies a number of different pressurised and non-pressurised (surface flow) irrigation systems. These include: sprinkler systems, drip irrigation systems, micro-irrigation systems, piped, small basin and short furrow (flooding) systems, and centre pivot systems.

On well-established commercial farms, irrigation technology has become accepted, and design and management are based on well informed rules-of-thumb. If the natural resources and the market potential exist in sufficient quantity, there is no reason why water under pressure cannot be used for small-scale farmer irrigation schemes. There is, however, the proviso that the irrigation scheme selected must be designed, manufactured, installed and managed to be appropriate for the circumstances under which it is going to be used.

Technology must in all respects be appropriate. It is usually a relatively simple matter to identify the most efficient methods of undertaking any of the tasks involved in an irrigation scheme. Manageability, labour requirements, and size of plot and distance from the field should influence the choice of technology. However, what is far more difficult is accessing what irrigation method is likely to be the most appropriate at any point in time. This is dependant on the product being produced, the rate of development of technological skills by participants, the relative costs of alternative inputs, and the support of outside organisations and cash flow.

The critical issue affecting the long-term viability of small-scale irrigation farmers is deciding upon an irrigation system that is most appropriate to the social, economic and farming needs of the community. Balancing these some-times conflicting needs will require that trade-offs be made, which may prove to be a very difficult exercise in rural communities not used to such challenges. Chapter 6 deals with these issues in greater depth.

### **Production and Marketing**

#### *Production*

Partly as an outcome of the 'estate-type' farming mode adopted by the parastatals, African small-scale irrigation farming has turned into an unliveable, high cash-cost enterprise<sup>9</sup>. A major

contributor to the high cash cost is the high level of mechanisation of farm operations. Parastatals, like the ARDC, used heavy equipment for ploughing and land preparation, spraying and harvesting. As a result, the tradition of using animal power has disappeared in many small holder schemes.

With the withdrawal of parastatals, accessing equipment at affordable rates has emerged as a major problem. The development of local equipment rental markets has been slow and variable, and rental rates are high. This has squeezed the small holder farm economy from two sides: the margins for irrigated farming have been hit and working capital requirements have increased.

Irrigated crop production usually makes use of high levels of inputs<sup>9</sup>. These inputs include planting materials (hybrid seed, vegetable transplant), chemical fertilisers, chemicals for plant pest and weed control and the use of mechanised implements in land preparation, cultivation and harvesting. In order to maintain high levels of production and quality it is important that farmers have ready access to all the necessary inputs. In the case of small scale irrigated farmers on schemes situated in rural areas, it may be necessary to arrange access to inputs through a central service managed by the Scheme, as was the case at most of the schemes in Former Ciskei and Transkei or through private entrepreneurs

These include power supply, communication facilities, domestic water supply etc. These facilities are essential for rural development. John Howel (1985) states that lack of rural infrastructure is proving to be extremely expensive in terms of production. Most unemployed young people in the prime of their youth do not wish to stay in the rural areas where these utilities are lacking. Hence, they migrate to towns to seek for employment leaving old people in the villages who are usually too weak to cultivate the land effectively due to lack of labour.

In order to market ones produce, it may be necessary to make several phone calls or send a number of facsimiles to various outlets<sup>10</sup>. As such, there are transaction costs involved before the produce gets to the market. These transaction costs can at times be so high as to render and enterprise uneconomical. Thus, cheap and efficient communication service is essential even in agricultural enterprises. In the area of study, communication services are of very poor quality when they are available but in most schemes they are either non-functional or do not exist at all.

In most schemes where this study was conducted, rural electrification has not yet begun. However, power supply is available for pumping of water in the schemes. Few of the projects have clean domestic water supplied to the farmers.

What little evidence that is available on African small-scale irrigation farming suggests that these have more than their fair share of pump irrigation schemes which are more costly and difficult to operate and maintain than gravity schemes. World-wide experience is that operation and maintenance costs of irrigation schemes is an insignificant proportion of total income – typically less than 5% of the gross income from farming. In many African pump irrigation schemes, this proportion is far higher. If the Arabie-Olifants scheme were to be turned over to farmers in today's condition, running it would cost 20 – 25% of the total value of irrigated output the scheme produces<sup>11</sup>.

### *Marketing*

Marketing is a vital factor to successful development<sup>12</sup>. Small-scale irrigation farming schemes should be able to serve their own immediate hinterland, and local communities should be involved in the distribution and retailing of the produce. The degree of organisation and formal structures that are required to achieve this will vary greatly from one area to another.

Another possibility is the co-operative transport and marketing of produce through conventional marketing channels such as regional markets, but this requires a very considerable degree of sophistication not only in production but also in packaging and marketing. Another alternative is the formation of a linkage with exiting processors, packagers or marketers of general commodities. This could be through a citrus pack house, a canned fruit or vegetable installation or a sugar mill. This is an attractive alternative but may impinge on farmer independence. In the

past there was a major concentration on commodities such as grain or cotton that was marketed through co-operatives. A number of key questions that need to be addresses include:

- Has the possibility of providing for the fresh produce needs of local communities been assessed?
- If this exists, can it be extended?
- What would the future potential be?
- What would the impact on the 'bakkie' trade and 'spazas' be?
- Has the potential for marketing in competition with other producers been assessed?
- Have organisations that can assist/participate been identified?
- Has the potential for co-operation with commodity groups been assessed?
- Are there niche markets or specialised products that have potential?

These production and marketing issues are addressed in more detail in Chapter 7.

## Finance

The overall economics of small-scale irrigation farming needs to be examined carefully<sup>13</sup>. Affordable irrigation technology will still need to be paid for, repaired and replaced. Farmers will need to borrow to purchase the technology, either individually or as a group.

Guidance on the most suitable way of providing access to credit and revolving funds should be sought. Irrigated agriculture requires closer attention to land preparation, seeds, seedlings, fertilisers, pesticides, harvesting, post-harvest handling if the improved production potential is to be realised.

The influence of the large-scale commercial sector, with its economies of scale should not be ignored. Small-scale irrigation and community gardening are unlikely to be able to compete across the board. Certainly there will be specialised niche markets (organic, herbs, minor crops, etc.) but in general small-scale / small holder irrigated agriculture will need to sell or barter into the local community (local shops, markets and co-operatives, roadside trading).

There is plenty of opportunity and demand at present to provide fresh vegetables in the poorer regions. Vegetable production is preferred as these higher value crops give better returns on the irrigation technology investment and give a better cash flow being harvested at more regular intervals.

A major constraint that small-scale irrigation farming faces is the difficulty of accessing credit, inputs and output marketing facilities<sup>14</sup>. Most small holder schemes are located in remote areas away from towns and cities with which they often have poor linkages. In the past, output marketing and input supply were centralised. Such markets as previously existed gradually disappeared. As a result, today, on many schemes, the most binding constraint on making small holder schemes viable is the absence of credit, input and output markets. Moreover, traditional markets that were available seem to have disappeared.

Some of the more critical financial issues affecting the long-term viability of small-scale irrigation farming include:

- The economic viability of rehabilitation – can rehabilitated schemes sustain themselves?
- Recovery of the operational, maintenance, production and running costs of irrigation schemes from farm incomes – can small-scale irrigation farmers afford these systems?
- The difficulty for small-scale irrigation farmers in accessing credit – the absence of credit markets, shortages of operating and fixed capital, discrimination against small farmers by lending agencies, etc.

Chapter 8 deals with the subject of finance for small-scale irrigation farmers.

## Management

Managing small-scale irrigation schemes in small holder communities is a difficult proposition, not because small holders are less able or less co-operative, but partly because most of them are half-hearted farmers and more importantly, because the management cost of an irrigation system – like most service institutions – increases faster with the number of customers than with the volume of business<sup>15</sup>. A 1 500 hectare system that serves 1 500 irrigators costs much more to manage - in terms of the logistics of service delivery, fee collection, maintenance, and so on – than a similar system that serves 5 large farmers. Moreover, it is a lot easier for 5 large customers to come together and agree to the rules of self-management than for 1 500 small holders to do so.

The critical management issues affecting the long-term viability of small-scale irrigation farming include:

- Absence of WUAs at a local level – there are no proper institutions and infrastructure available within which irrigation schemes can be managed
- A lack of properly qualified scheme managers, water bailiffs, extension officers and farmers themselves

These issues are addressed in more detail in Chapter 9.

## PART II: SYNOPSIS

Topics	Issues	Background	Possible Solutions
<b>FARM TENURE SYSTEMS</b>			
<b>Tribal/Communally Owned Land</b>	The tribe (tribal authority with a Headman) owns the Land	<ul style="list-style-type: none"> <li>- Farmers are at the mercy of the headman.</li> <li>- No incentive for uninterested farmers to sell the land they occupy.</li> <li>- Interested farmers can not attain more land.</li> <li>- No flexible rental of land</li> <li>- No land for collateral to obtain loans</li> <li>- Women have no say in land ownership although they work the land.</li> </ul>	<ul style="list-style-type: none"> <li>- Small irrigation farmers should have their own say over the land they occupy</li> <li>- Uninterested farmers should lease out their land or leave the land.</li> <li>- Interested farmers should be able to lease unoccupied and/ or undeveloped land.</li> <li>- Land in production should stand as collateral to obtain loans</li> <li>- Interested farmers should own tribal land</li> <li>- Clear water rights</li> <li>- Clear land occupation rights</li> <li>- Farmers occupying holdings (plots) on irrigation schemes desire individual property rights that will allow them true ownership of land and the development on it.</li> <li>- Give farmers the right to purchase freehold land outside tribal land.</li> </ul>
<b>State and SA Development Trust Owned Land</b>	State land occupied by farmers without land ownership Commercial land bought by government and farmed as a Trust.	<ul style="list-style-type: none"> <li>- Farmers are at the mercy of the State</li> <li>- No flexible rental of land</li> <li>- No land for collateral to obtain loans</li> <li>- Land are allocated to men but women work the land</li> </ul>	<ul style="list-style-type: none"> <li>- Farmers should get all possible support.</li> <li>- Farmers should be settled on the land.</li> <li>- Land should be private occupied.</li> <li>- Ownership base should be broadened.</li> </ul>
<b>Land Restitution (Hervestiging) and Group Resettlement</b>	Land given back to the people, owned by a community, run by a board of trustees, elected by the community, etc. People resettled on existing commercial farm land and state land, where no secondary rights to the land exist	<ul style="list-style-type: none"> <li>- Farmers are at the mercy of a group of landowners.</li> <li>- No incentive for uninterested farmers to sell the land they occupy.</li> <li>- Interested farmers can not attain more land.</li> <li>- No flexible rental of land</li> <li>- No land for collateral to obtain loans</li> <li>- Women have no say in land although they work the land.</li> </ul>	<ul style="list-style-type: none"> <li>- Small irrigation farmers should have their own say over the land they occupy</li> <li>- Uninterested farmers should lease out their land or leave the land.</li> <li>- Interested farmers should be able to lease unoccupied an / or undeveloped land.</li> <li>- Land in production should stand as collateral to obtain loans</li> <li>- Interested farmers should own tribal land</li> <li>- Clear water rights</li> <li>- Clear land occupation rights</li> <li>- Farmers occupying holdings (plots) on irrigation schemes desire individual property rights that will allow them true ownership of land and the development on it.</li> <li>- Give farmers the right to purchase freehold land outside tribal land.</li> </ul>
<b>Freehold (private) and Qultrent (erfpag) Land</b>	Privately owned land Inherited land	<ul style="list-style-type: none"> <li>- Farmers possesses the land</li> <li>- Farmers inherit land from family members</li> <li>- Farmers perched land</li> <li>- Land gets donated to farmers.</li> </ul>	<ul style="list-style-type: none"> <li>- Freehold is the ideal situation for a Small-Scale irrigation farmer</li> <li>- Farmers are part of the free market.</li> <li>- They posses land as collateral to obtain loans.</li> </ul>

			- These farmers usually want to farm.
--	--	--	---------------------------------------

Topics	Issues	Background	Possible Solutions
<b>FARM TENURE SYSTEMS</b> (continued)			
<b>Irrigation Management Transfer and Small Irrigation Systems</b>	<p>IMT has to make good economic sense to farmers</p> <p>The larger the number of farmers involved, the higher the management costs</p> <p>IMT must offer improved livelihoods at an acceptable cost</p>	<ul style="list-style-type: none"> <li>- The original design and aim of most SIS was subsistence-orientated. Little participation by irrigators from the beginning, no local organisation, most land rights are granted to men, while women are the actual irrigators.</li> <li>- Heavy operation and maintenance costs in most schemes, but still most irrigators are subsistence farmers, weak agribusiness environment.</li> <li>- The brutal withdrawal of any support in most schemes.</li> <li>- It is policy to transfer from government to the participants or to organisations that promote the requirement of previously disadvantaged farmers</li> </ul>	<ul style="list-style-type: none"> <li>- Small holding irrigation schemes of SA are currently facing privatisation,</li> <li>- Continuous degradation (which is the current trend) then collapse, this means that a large majority of the remaining cultivated plots would be eventually rain-fed, or</li> <li>- Some form of sustainable self-management, which means that a large majority of plots would be cultivated and irrigated, and that the neighbouring communities would benefit from it.</li> <li>- removal of the various laws, which controlled access to land, including the Land Acts</li> <li>- Legislation to enhance land-use security and reduce the transaction costs of exchange or alternative forms of access such as land rental and tenancy agreements.</li> <li>- extension of labour relations' legislation to the agricultural sector</li> <li>- Removal of legal barriers to access to farmer support services such as quotas and permits on sugar and red meat for small holders and black farmers.</li> <li>- Policy Instruments And Empowerment Actions.</li> <li>- access to land through purchase</li> <li>- other forms of access to land-use rights</li> <li>- infrastructure provision</li> <li>- farm credit</li> <li>- extension, research and training</li> <li>- marketing policy</li> <li>- equalising access to lobbying</li> <li>- participation in macro-economic and agricultural policy formulation</li> </ul>
<b>Government Land Tenure Reform</b>	<p>Government overreacts, Take no action or take the wrong action in the issue of land tenure</p>	<ul style="list-style-type: none"> <li>- Government over reacts by handing land over to farmers and withdrawing completely.</li> <li>- Government manages land without giving the responsibility to the Farmer.</li> <li>- Government gives very little support to farmers or withdraws it abruptly.</li> <li>- It is a lengthy process.</li> <li>- The present users of the land are not true owners, since they can not sell the land if they</li> </ul>	<ul style="list-style-type: none"> <li>- Transfer of ownership from Government to the people must take its time. There must be an adjustment period.</li> <li>- Farmers on Government schemes must be drawn in gradually, so that they manage the farm fully by take over.</li> <li>- Financial support must be phased out gradually.</li> <li>- Financial management by the farmer must be phased in gradually.</li> </ul>

		wish to do so	- Management transfers must not be too short or too lengthy.
--	--	---------------	--

Topics	Issues	Background	Possible Solutions
<b>INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS</b>			
<b>General Issues</b>	<p>Commercial farmers adapt to institutional arrangements, making a success of it.</p> <p>Small-Scale irrigation Farmers seldom make a success of institutional settings.</p> <p>There need to be checks and balances to prevent management being take over by the politically or economically powerful</p> <p>Structures should develop on an evolutionary basis in phase with scheme development.</p> <p>There are two groups of issues: firstly, the day-to-day management and physical maintenance and development of the scheme and, secondly, the effective mobilisation of all the many support services required by the community</p>	<ul style="list-style-type: none"> <li>- Institutional settings are new to small-scale farming</li> <li>- Inexperience of farmers: Running a Water/Irrigation Board is a burden to them.</li> <li>- Small Farmers do not have the extra money to finance institutional arrangements.</li> </ul>	<ul style="list-style-type: none"> <li>- Small-scale irrigation farmers must be educated and familiarised with the different institutional settings.</li> <li>- They must also be helped financially to be part of institutional settings.</li> </ul>
<b>The New Water Policy</b>	<p>The right to use water is granted to users, most of whom have to be registered and licensed, and should pay for this right.</p> <p>The privatisation of small farmers (IMT) runs parallel with implementing a new water act.</p>	<ul style="list-style-type: none"> <li>- Since the mid 1980's, the apartheid system has been gradually dismantled, and from 1994 onwards, the new democratic South Africa has striven to iron out distortions and discrepancies</li> </ul>	<ul style="list-style-type: none"> <li>- The government has undertaken to reduce rural poverty, and has adopted a land reform program, new water legislation and improved services delivery in rural areas</li> <li>- Direct consequences are state withdrawal from former commitments and controls, the liberalisation of markets, decentralisation, and the transfer of power to local management and decision-making structures</li> </ul>
<b>The Present Institutional Situation</b>	<p>Irrigation agriculture in South Africa comprises a diverse group of subsistence, emerging and commercial farmers with permanent and seasonal labourers and their dependent families.</p> <p>The scale and success of irrigated agriculture is highly diverse, ranging from large commercial enterprises competing on the world market, through successful small-scale enterprises and community gardens to poorly performing initiatives still heavily dependent upon government support.</p> <p>In many places, this has resulted in unsustainable, poorly performing small-scale irrigation schemes with a high level</p>	<ul style="list-style-type: none"> <li>- There is an expectation that "government will still do everything" in the minds of many leading to strong dependency and farmers being unwilling to take action on their own.</li> <li>- Poor communication and co-ordination between different government agencies, especially at the provincial level.</li> <li>- Remote location of many community gardens and small-scale schemes leading to frustrations over technical assistance and market access</li> <li>- Lack of clarity of the impact of the new Water Act and how it will effect small-scale and small holder irrigators</li> <li>- Complicated political process and issues in getting land allocated for community gardens</li> <li>- Immature NGO and voluntary service development in irrigation sub-sector</li> </ul>	<ul style="list-style-type: none"> <li>- Successful irrigated agriculture</li> <li>- Well trained technical officers</li> <li>- Reasonable supply network for equipment, seeds and fertilisers</li> <li>- Reasonable access to manufacturers, suppliers, services agents and technical experts</li> <li>- Telecommunications and market information</li> <li>- Provincial and national government policy directed towards small-scale development</li> <li>- Co-ordination between DWAF, NDA, Provincial Departments of Agriculture and others</li> <li>- Growing experience in mobilising and empowering farmer groups (especially women) and in establishing WUAs through a participatory process.</li> <li>- The proposed rural land reforms in South Africa must facilitate the evolution of institutions that are well suited to the region and that ensure security to</li> </ul>

	<p>of dependency among the farmers and cultivators.</p> <p>The development of government sponsored community gardens has followed the same process.</p>	<ul style="list-style-type: none"> <li>- Lack of resources especially in Provincial Departments of Agriculture extension services leading to frustration and inability to achieve work programs.</li> <li>- Institutions governing the use of communally held land in Southern Africa do not provide individuals with economic incentives to invest and do not allocate scarce land efficiently.</li> </ul>	<ul style="list-style-type: none"> <li>- tenure and the productive use of land.</li> <li>- It is important that institutions are allowed to evolve endogenously in these areas, and that they facilitate the evolution of the secure property rights required by small farmers.</li> </ul>
--	---	---	--

Topics	Issues	Background	Possible Solutions
<b>INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS (continued)</b>			
<p><b>Institutional Support Systems</b></p>	<p>In South Africa, there are hardly any cases of institutional failures in farmer management of irrigation schemes by Irrigation Boards involving large, commercial farmers, and</p> <p>There are hardly any cases of successful farmer-management in small holder irrigation schemes</p>	<ul style="list-style-type: none"> <li>- In small holder schemes, farmers pay little or nothing for irrigation, whereas the Irrigation Board farmers pay for irrigation on a full cost of operation and maintenance basis and they will pay much more for water itself once the RSA government's new full-cost water pricing policy comes into force.</li> <li>- Farmers in the Irrigation Boards have reasonably large farms, access to capital to invest in commercial crops, and average farm incomes in the range of R1-2.5 million.</li> <li>- Commercial farmers (with Irrigation Boards), have well-functioning irrigation system that are central to their livelihood. They have the resources, as well as the management skills for trouble-free and sustainable management of large systems</li> <li>- Small holder groups present tiny farms give them little net income, nor do they have the resources and management capacity to operate their schemes viably</li> <li>- Irrigation farming can be very profitable, provided the following are present: high quality management, markets and infrastructure, and sufficient equity capital. Africa's small holder irrigation farmers have none of these, and without these, IMT can easily become a millstone around their necks.</li> <li>- The government [did] not only operate and maintain these schemes, but also provided the agro-support services such as land preparation, seeds, fertilisers and chemicals to farmers. Farmers virtually had no role to play except to</li> </ul>	<ul style="list-style-type: none"> <li>- Farmer management of small holder irrigation schemes can become viable and sustainable but only as an element of a broader "lift" strategy that addresses the entire complex of constraints (including capital scarcity, low enterprise and risk-taking capacity, shortage of machines, poor market-linkages</li> <li>- Access of rural households to basic agriculture services such as extension, credit, inputs, mechanisation and markets</li> <li>- South Africa has chosen a more positive and proactive stance towards the management of state withdrawal, "to create an enabling environment through which beneficiaries can, by means of a systematic take-over program, assume full responsibility and control of these schemes in a sustainable manner</li> <li>- The context of African small holder irrigation needs to shift from institutional reform of small holder irrigation management to institutional intervention designed to significantly enhance small holder productivity and incomes.</li> <li>- Institutions appropriate for this are not pure WUAs, but either farmer-controlled organisations with a much bigger mandate and capacity or, with strong institutional linkages to agri-businesses that play a central role in-executing an upliftment strategy.</li> </ul>

		<p>divert. Since 1988, the government has practically withdrawn from providing funds and services, and the managing agencies are expected to be self-sufficient and self-sustaining</p> <ul style="list-style-type: none"><li>- The dwindling operating funds and government's abrupt withdrawal have contributed to serious deterioration of most systems' structures</li><li>- One reason why farmers as well as companies default on their commitments is that the farmers are not organised</li></ul>	
--	--	---	--

Topics	Issues	Background	Possible Solutions
INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS (continued)			
<b>Water User Associations</b>	<p>A WUA is a statutory body that are, in effect, co-operative associations of individual water users who wish to undertake water related activities for their mutual benefit.</p> <p>A WUA enables people within a community to pool their resources (money, person power and expertise) to more effectively carry out water-related activities.</p> <p>A WUA may be concerned with a single purpose such as controlling recreational activities on a river, or providing water for emerging farmers</p> <p>The Act provides a formal institutional structure for WUAs. This enables water management to be devolved closer to the level of actual use. A WUA, together with other water management and service institutions, is responsible for executing the Catchment Management strategy at a local level.</p> <p>Establishment of WUAs for four main purposes:</p> <ol style="list-style-type: none"> <li>1. Water for irrigation</li> <li>2. Stream flow reduction activities.</li> <li>3. Treatment and disposal of effluent and waste</li> <li>4. Control the use of water for recreational and/or environmental purposes.</li> </ol>	<ul style="list-style-type: none"> <li>- Small-scale irrigation farmers have never been part of a WUA</li> <li>- Small-scale irrigation farmers have a very bad success rate with WUAs</li> </ul>	<ul style="list-style-type: none"> <li>- Small-scale irrigation farmers must be uplifted to the level of commercial farmers to appreciate a WUA.</li> <li>- New Services that the WUA could provide include:             <ul style="list-style-type: none"> <li>- provision of agricultural inputs, including credit</li> </ul> </li> <li>- regulating crop choices and scheduling planting dates</li> <li>- mobilising additional sources of revenue</li> <li>- carrying out agricultural processing and marketing</li> <li>- exercising land and soil management.</li> </ul>
<b>Organisational Services</b>	<p>Organisational services include:</p> <p>Banking Services</p> <p>Scheme Management Services</p> <p>Land Preparation and Maintenance Services</p> <p>Training and Extension Services/Facilities</p> <p>Retail Outlets And Marketing Services</p> <p>Input Markets (including planting material, fertilisers and chemicals)</p> <p>Advisory Services</p> <p>-Farmer Organisations</p>	<ul style="list-style-type: none"> <li>- Estates and large Schemes do have services, but often farmers work as labourers and do not come into contact with services or benefit from them.</li> <li>- Services are out of reach of farmers</li> <li>- Farmers are not educated to make use of services.</li> <li>- Farmers are scared to make use of services.</li> <li>- Poor services are delivered to Farmers</li> </ul>	<ul style="list-style-type: none"> <li>- Education</li> <li>- Experience</li> <li>- Services must be phased in at a speed the farmer can handle</li> </ul>

	Farmers' Committee - Extension Services		
--	--	--	--

Topics	Issues	Background	Possible Solutions
<b>THE INFLUENCE OF SOCIAL FACTORS</b>			
<b>Social Infrastructure</b>	<p>Infrastructure can be divided into two categories: physical infrastructure and social infrastructure</p> <p>Social infrastructure covers religions, educational institutions and organisations, tribal and communal laws, extension, credit and financial institutions related to or involved in agricultural production. Social considerations may exert greater influence on human behaviour than financial ones</p> <p>Irrigation development increases production and an efficient marketing system has to be in place to cope with increased production.</p> <p>In developing countries, marketing systems are inefficient. With a poor marketing system, the farmer will not be able to sell his surplus produce. As a result, the farmer tends to produce only for his own consumption. Produce markets and input markets do have a great influence on the agricultural enterprises. If these markets are situated far away from the projects areas, (especially the small irrigation projects), then the cost of transportation can significantly reduce the profitability of the projects</p> <p>Social services and amenities relate to social infrastructure, which is often viewed by people in the community as an extension of social welfare i.e. the monthly pension scheme. The range of social services and amenities can be categorised into educational (schools), religious (churches, mosques), entertainment (sports fields) and health (clinics, hospitals).</p> <p>Some services are provided free while others are perceived to be free. This has in some ways perpetuated the continuation of a dependency syndrome and unnecessarily attracted blame from the beneficiaries to the providers for a slow process of service delivery.</p>	<ul style="list-style-type: none"> <li>- A sound Social Structure is dependent on the availability of good Institutions and organisations.</li> <li>- The availability of social structures in communities varies considerably.</li> <li>- The standard of Institutes and organisations vary.</li> </ul>	<ul style="list-style-type: none"> <li>- Institutional settings and Organisations must reach all</li> <li>- Small-Scale irrigation farmers to improve social infrastructure.</li> <li>- The standard of Institutes and Organisations must improve</li> </ul>

*Appendix A**Literature Survey*

<b>Socio-Economic Factors</b>	Household income and expenditure is a crucial variable in two respects. Firstly, income and expenditure is a measure of relative well being and, secondly, it illustrates the degree of dependence on local farm and non-farm resources.	<ul style="list-style-type: none"><li>- Most household incomes are low.</li><li>- Households consume irrigation produce and little is left over to sell for a profit.</li><li>- Many small-scale irrigation schemes show very little or no profit.</li></ul>	<ul style="list-style-type: none"><li>- Increased production of irrigated crops will increase socio-economic conditions</li><li>- Alternative forms of social security should be encouraged and a land rental market stimulated.(4.5.4.5 Moore 1996)</li></ul>
-------------------------------	--	--	--

Topics	Issues	Background	Possible Solutions
<b>THE INFLUENCE OF SOCIAL FACTORS (continued)</b>			
Socio-Psychological factors	<p>Scheme Objectives : Farmers perceive that the scheme objective was to improve their livelihood through producing crops all year round</p> <p>Scheme Rehabilitation : Schemes in disarray must be brought up to standard</p> <p>Farmer Participation : should play a greater role in decision-making</p> <p>Perceived Problems: an assured water supply, water quality, adequate fencing, provision of draught power, repair of the irrigation system and theft prevention.</p> <p>Conflicts: conflict problems concerned theft of crops and damage to irrigation equipment</p> <p>Farm Decision-Making: decisions were made jointly between husband and wife and, the extension officer.</p> <p>Gender Issues: generally speaking, irrigation schemes have involved women in working longer hours, having less access to land and becoming more dependent on their husbands.</p>	<ul style="list-style-type: none"> <li>• Farmers had benefited from the scheme through producing food and being able to sell crops to boost household income.</li> </ul>	
A History of Dependence	<p>The Agriculture and Rural Development Corporation (ARDC) has managed small holder irrigation schemes through an elaborate top-down command and support system, which has eventually proven unsustainable.</p> <p>Under a version of contract farming, irrigation to small holders was fully subsidised, and the ARDC organised mechanised cultivation, planting and fertiliser application in the schemes.</p> <p>ARDC also organised the marketing of pooled produce; it deducted all its expenses before turning the residual sum, such as it was, over to farmers.</p> <p>The parastatals' abrupt withdrawal has had a telling effect on small holders</p>	<ul style="list-style-type: none"> <li>• All that the plot holders did was weed, harvest and move the irrigation pipes around. They did not deploy much working capital, nor did they need to make any decisions about farm management, which was pretty much centralised.</li> <li>• The support systems operated by parastatals for small holder irrigation schemes in many African countries have left behind a legacy of impoverishment and dependency.</li> <li>• In some cases, these have degenerated into oppressive 'spoils systems' that destroyed all pre-existing informal institutions, compelling farmers' dependency and robbing them of their enterprising and elementary skills to manage input and output markets.</li> <li>• Cropped areas in many South African small holder schemes dropped sharply in less than a year after government withdrawal, simply</li> </ul>	<ul style="list-style-type: none"> <li>• Small-scale irrigation farmers must slowly be led to attain or take over decision making-, managing- and farming skills.</li> <li>• Government must ease out their support gradually.</li> </ul>

		because plot holders were unable to organise by themselves the working capital needed to hire tractors, buy seeds an fertilisers, and obtain services.	
--	--	--	--

Topics	Issues	Background	Possible Solutions
<b>IRRIGATION SYSTEMS</b>			
Small-Scale Farmer Irrigation in SA	<p>A major problem, which has emerged over the past five years, is that provincial governments no longer have the resources to continue funding management of small-scale farmer irrigation schemes. This has resulted in partial or complete collapse of some schemes.</p> <p>Despite huge investments, the performance of most of the small-scale farmer irrigation schemes has been poor.</p>		
Technological Constraints	<p>Technology must in all respects be appropriate. It is usually a relatively simple matter to identify the most efficient methods of undertaking any of the tasks involved in an irrigation scheme.</p> <p>What is far more difficult is assessing what irrigation method is likely to be the most appropriate at any point in time. This is dependant on the product being produced, the rate of development of technological skills by participants, the relative costs of alternative inputs, and the support of outside organisations and cash flow.</p> <p>The choice of technology is influenced by manageability, labor requirements, size of plot and distance from the field.</p> <p>Gravity fed schemes generally have much lower running costs than pumping schemes. The most economic delivery system, including adequacy of pump stations, needs to be investigated before any implementation takes place.</p> <p>In pumping schemes, the state of pumps and motors, as well as in-field sprinkler equipment needs to be carefully assessed and costs obtained from engineers and dealers.</p> <p>The state of storage works, especially the degree of silting and costs of removing silt also needs to be assessed, aimed at ease of operation and use.</p>		

Topics	Issues	Background	Possible Solutions
IRRIGATION SYSTEMS (continued)			
Sprinkler Irrigation	<p>Most aspiring small-farmers regard sprinkler irrigation as being the norm to which they are entitled.</p> <p>One of the difficulties experienced by independent farmers, particularly in the communal areas, is the difficulty of obtaining skilled advice on equipment selection and design, as well as the difficulty of obtaining the equipment itself. All irrigation system design starts with crop water requirements.</p> <p>Using irrigation under pressure must enable production to be at a level that provides sufficient income to be able to pay for the irrigation system and its operation and maintenance. The capital and operating cost of pressurized schemes is a concern.</p> <p>The level of management demanded by sprinkler irrigation should not be under-estimated. This is particularly true on schemes where farmers are dependent on shared water supply infrastructure</p> <p>Sprinklers are very dependent for efficient operation on maintenance of the correct pressures in the system</p> <p>There is a need for greater technical support. Motors and pumps must be maintained. Farmers in general do not pay attention to minor maintenance chores, such as replacing rubber washers and worn nozzles, and they leave repairs until it is too late.</p> <p>Sprinkler irrigation can be a management problem when there are severe water shortages, because sprinklers are designed to distribute water over the whole area. The sprinkler waters a circle and, to obtain even coverage over the whole lawn, must be moved at regular intervals.</p> <p>A major advantage of sprinkler systems is that a farmer can start in a small way and expand the system as he learns how to use it and can afford it. If the farmer plans to do this, provision</p>	<ul style="list-style-type: none"> <li>- The method appeals because sprinkler irrigation can be used with a minimum of land preparation, application quantities can be simply controlled, sandy soils are not a major problem and the sprinklers need not be tended all day. The pipes are moved once or twice – and that is all there is to it!</li> <li>- In addition to big schemes, there are a very considerable number of small, independent farmers in communal land tenure areas who have their own small sprinkler irrigation systems. The State generally, directly or indirectly, accepted responsibility for the maintenance of systems. Despite this, many schemes have failed</li> <li>- There is very little one can do to circumvent unsatisfactory climate, soil or water quality and supply. In the past, this has not received sufficient attention.</li> <li>- If one remembers to move the sprinkler, it is not easy to judge where the sprinkler should next be positioned so that the wetted circles overlap, to obtain even coverage. Any gardener will therefore appreciate how difficult it is for a small farmer to achieve uniform irrigation distribution.</li> <li>- It is very difficult for many small farmers to comply with these designed stand times. One reason is that, in many cases, the village where the farmers live is some distance from the fields and transport is seldom available so it is difficult for them to get to the lands twice a day. Also, a large proportion of the farmers or farm workers are women with household duties that make it impossible for them to be away from home early or late in the day when sprinklers should be moved. Inevitably, and for very good reason, their day shift ends up being short and the night shift long.</li> <li>- Unauthorized, but very natural, modifications to systems. The most common is the addition of sprinklers and/or laterals in order to cover more ground, without making any changes to pump</li> </ul>	<ul style="list-style-type: none"> <li>- There is no reason at all why pressurized irrigation should not be successfully applied by small-scale farmers, particularly if they have built up experience and management skills on commercial farms.</li> <li>- Small-farmer sprinkler irrigation systems are designed to operate in two equal shifts about ten hours long, with the pipes being moved in the early morning and late afternoon. It is possible to design a system with stand times to suit the requirements of the farmers.</li> <li>- It is irresponsible to even consider irrigation under pressure for a community if they are not able to produce effectively and efficiently, and do not have the means to market the products they produce.</li> </ul>

*Appendix A*

*Literature Survey*

	<p>should be made at the planning stage. However, vandalism and theft of equipment in the deep rural areas is a problem.</p>	<p>ground, without making any changes to pump capacity or pipelines.</p>	
--	--	--	--

Topics	Issues	Background	Possible Solutions
<b>IRRIGATION SYSTEMS</b> (continued)			
<b>Drip Irrigation</b>	<p>Drip irrigation is an attractive approach that is becoming more and more applicable, not only for specialized horticultural agricultural crops, but also for field crops in the commercial farming sector.</p> <p>Water quality and filtration are important. It should be noted that the whole purpose of drip irrigation is a very slow, controlled application of water.</p> <p>Drip irrigation is an expensive and management-intensive method of irrigation and is not normally considered suitable for small-farmer applications.</p>	<ul style="list-style-type: none"> <li>- Farmers tend to neglect the filtration process, clogging the drip holes.</li> <li>- The do-it-yourself approach of drilling a series of holes in a plastic pipe and allowing the water to run through these holes into the ground cannot be considered to be conventional drip irrigation. If they are on the surface, these DIY rigs really approximate to piped furrow irrigation.</li> <li>- There are signs that there is increasing interest in drip irrigation.</li> </ul>	<ul style="list-style-type: none"> <li>- Drip irrigation only becomes a feasible proposition for small-scale farmers when there is practical, site-specific experience and understanding of drip irrigation under the circumstances under which it is going to be used</li> </ul>
<b>Micro Irrigation</b>	<p>Micro irrigation is largely used for fruit crops in commercial orchards but can have additional specialist applications that should not be neglected.</p>	<ul style="list-style-type: none"> <li>- In the case of schemes and individual farmers operating orchards, there has been successful exposure to micro irrigation.</li> </ul>	
<b>Giant Micro/Floppy Sprinklers</b>	<p>The floppy sprinkler is entirely plastic, which makes it unattractive to scrap metal thieves</p> <p>It can be installed overhead, where it is less vulnerable to vandalism than conventional applicators. However, this is not a low-cost system</p>	<ul style="list-style-type: none"> <li>- Commercial and small-scale farmers know this system.</li> </ul>	<ul style="list-style-type: none"> <li>- The use of irrigation systems of this nature is dependent on the production of high return crops.</li> </ul>
<b>Piped Furrow Irrigation</b>	<p>Conventional drip irrigation has a low controlled application rate. This variation on the drip irrigation method uses permeable drainpipes, or PVC laterals, with relatively large holes that have much the same effect as furrow irrigation, without the penalty of losses due to excessive penetration in light soils.</p> <p>On the surface, piped furrow irrigation can have merit because, in very sandy soils, furrow irrigation – even in relatively short furrows like those used in community gardens – are not very satisfactory because of the very rapid infiltration rate into the soil.</p>	<ul style="list-style-type: none"> <li>- Allowing the water to flow through a plastic pipe with a series of holes along it is a very good way of applying the water in furrows with good distribution and minimum losses due to deep percolation.</li> <li>- There are systems that can best be described as 'piped' furrow irrigation that are promising and have been initiated by individuals on a do-it-yourself basis.</li> <li>- This method is being developed by farmers themselves but has not as yet had any critical assessment.</li> </ul>	
<b>Center Pivots</b>	<p>Center pivot sprinkler systems have become very popular, and more than 15 000 are in</p>	<ul style="list-style-type: none"> <li>- Center pivots have been used on a limited number of small farming schemes.</li> </ul>	

	<p>operation in the RSA.</p> <p>The apparent simplicity of operation and the advantages are very attractive to all farmers, including small farmers, and there are several small-farmer schemes that utilize center pivots.</p> <p>Center pivots are designed to irrigate circles, generally ranging in size from 30 to 100 hectares in area. The ploughing of the land and other contractor services require co-ordination between farmers, and this tends to reduce their freedom of action. The center pivot also makes it difficult for an individual farmer to plant several crops at one time.</p> <p>The high investment involved in center pivot irrigation means that, unless the yields are well above average, a scheme would not be financially viable. This implies that the other inputs, such as fertilizer, must be forthcoming, and that management, including disease and insect control and weeding, must be of a high standard.</p> <p>Center pivot irrigation is not feasible unless there is ESKOM power available.</p>	<ul style="list-style-type: none"> <li>- One of the key problems associated with communal centre pivot schemes is dividing up the electricity and water accounts when the participants may have followed different irrigation patterns, and there is as yet no means of metering the sectors individually?</li> <li>- There is very little that the individual farmer can do to rectify the things that go wrong with a center pivot. In a remote area, a relatively minor fault, such as a flat tire, stops the whole operation until repairs can be done and this can take several critical days.</li> </ul>	
Short Furrow Irrigation (flood)	<p>In the past, the majority of small-farmer irrigation schemes were based on flood irrigation.</p> <p>Flood irrigation can be transparent to a satisfactory degree or completely non-transparent, depending on the methods adopted and the circumstances under which they are applied.</p> <p>Although flood irrigation can play an important part in the future, it is important to understand the strengths and weaknesses of flood irrigation in the context of small-farmer irrigation:</p> <ul style="list-style-type: none"> <li>- the slope of the land</li> <li>- The rate at which water infiltrates</li> <li>- stream flow</li> <li>- the rate at which the water advances over the surfaces</li> <li>- the length of the land, and</li> <li>- the frequency with which water is made available.</li> </ul> <p>Under good management, the system tends to</p>	<ul style="list-style-type: none"> <li>- Conventional field-scale flood irrigation requires great experience and skill.</li> <li>- The saving grace in areas where flood irrigation has been applied for many years is that, with experience, farmers have learned how much they can irrigate, what area they can irrigate under specific circumstances, and generally how to match the area irrigated to the quantity and rate of water supply.</li> <li>- Unfortunately, ensuring uniform gradients is extremely difficult for small-scale farmers, who continually have the problem of lack of power for tillage purposes.</li> <li>- Small-basin and short-furrow irrigation have proved their suitability for small-scale irrigation schemes in Africa</li> </ul>	

	<p>become self-correcting.</p> <p>For most flood irrigation systems, it is essential that the land be well prepared and cultivated every season to ensure uniform gradients and to eliminate hollows, furrows and ridges which can distort the flow of water.</p>		
--	---	--	--

Topics	Issues	Background	Possible Solutions
IRRIGATION SYSTEMS (continued)			
<p><b>Small Basin &amp; Short Furrow Irrigation</b></p>	<p>There is great similarity in principle and layout between the small-basin and the short-furrow methods. The short-furrow method has the advantage that the water advances rapidly, ensuring even distribution in sandy soils with a high infiltration rate, while larger flow rates are required by the small-basin method.</p> <p>The short furrows divide the basin into narrow sub-basins, about 1 m wide and 10 m long. The main advantage of short-furrow irrigation is that there is very uniform distribution of water across the whole field, even where the gradient varies or when the flow rate is inconsistent, e.g. when another farmer suddenly starts irrigating between the first farmer and the water source. These variations in gradient or flow rate would make other methods of flood difficult or even impossible.</p> <p>In laying out the plots, the desired gradient can be obtained just by changing the direction of the furrows.</p> <p>Another advantage is the high level of involvement of the irrigator because this method requires constant opening and closing of short furrows.</p>	<ul style="list-style-type: none"> <li>- The regular, close contact with the whole field means that the farmer can keep a good check on the condition of his crops.</li> </ul>	

Topics	Issues	Background	Possible Solutions
<p><b>MARKETING</b></p> <p><b>Access to Markets</b></p>	<p>Small-scale farmer irrigation schemes should be able to serve their own immediate hinterland and local communities should be involved in the distribution and retailing of the produce.</p> <p>Another possibility is the co-operative transport and marketing of produce through conventional marketing channels such as regional markets. These require a very considerable degree of sophistication, not only in production but also in packaging and marketing.</p> <p>Another alternative is formation of a linkage with existing processors, packagers or marketers of general commodities.</p> <p>Has the possibility of providing for the fresh produce needs of local communities been assessed? If this exists can it be extended? What would be the future potential? What would be the impact on the 'bakkie' trade and 'spazas'?</p> <p>Has the potential for marketing in competition with other producers been assessed?</p> <p>Have organisations that can assist/participate been identified?</p> <p>Has the potential for co-operation with commodity groups been assessed?</p> <p>Are there niche markets or specialized products that have potential?</p> <p>Marketing of any new products should be thoroughly investigated. Market prices are essential in order to determine the value of outputs from present and proposed cropping programmes.</p> <p>Rehabilitation of irrigation schemes is only justified if there is an assured market. Insufficient attention has been given to marketing opportunities</p>	<ul style="list-style-type: none"> <li>- In the past there was major concentration on commodities such as grains or cotton that were marketed through co-operatives. A problem here was standardization of production for the whole scheme.</li> <li>- Most successful farmers have established a variety of selling operations to reduce risk.</li> <li>- With the limited local market in terms of buying power, agriculture has had to rely on export markets. Transport and storage facilities, as well as price expectations were often taken as secondary to technical aspects such as land cultivation and water provision.</li> <li>- Rural markets form the main outlet for the small farmer</li> </ul>	

Topics	Issues	Background	Possible Solutions
<b>MARKETING (continued)</b>			
<b>Infrastructure</b>	<p>Effective marketing is crucial to obtaining high gross margins. The lack of markets leads to low returns.</p> <p>The local market may not always be adequate or popular because of lack of purchasing power amongst the local community, but nevertheless needs to be taken into account.</p> <p>WUAs will need assistance from agricultural economists and other specialists, including processing organisations, in developing suitable marketing outlets for local produce.</p> <p>Infrastructure, including access roads, telephone services and electricity are all essential for marketing to function effectively. The extent to which a market system performs the various functions effectively depends on the availability and quality of the physical infrastructure such as storage, marketing and processing facilities; the financial institutions; the communication network and the entrepreneurial and managerial manpower.</p> <p>Marketing development is crucial for agricultural development in less developed areas and should keep pace with general agricultural development.</p>	<ul style="list-style-type: none"> <li>- Absence of markets or lack of improvements to existing markets and marketing systems can be obstacles to development.</li> <li>- Using market opportunities to sell only surpluses produced by traditional methods generates little growth.</li> <li>- Market facilities are, for example, too far from homesteads for most smallholding farmers.</li> </ul>	<ul style="list-style-type: none"> <li>- Co-operatives could play an important role in future marketing development, including provisioning of credit.</li> <li>- Marketing development must be part and parcel of agricultural development in less developed areas.</li> <li>- Markets should fit in with the cultural level, the wishes and the desires of the people.</li> </ul>
<b>Availability and Cost of Farm Inputs</b>	<p>Participants cite lack of finance for inputs as a major problem.</p> <p>Marketing of reasonable quality produce is also important</p>	<ul style="list-style-type: none"> <li>- Because of the subsistence nature of the economy, marketing was not perceived as a problem at present.</li> <li>- No profit from the sale of the surplus means that individual or community gardeners cannot buy good seed or seedlings and sufficient inputs for the next crop.</li> </ul>	
<b>Marketing Support Services</b>	<p>In developing agriculture in the rural areas of South Africa, traditional marketing systems often prevail.</p> <ul style="list-style-type: none"> <li>- markets are bulking points for goods to be exported from the region.</li> <li>- markets are distribution points for goods</li> </ul>	<ul style="list-style-type: none"> <li>- Traditional marketing systems are, in their own way, sophisticated, performing activities such as storage, handling, transportation and processing activities.</li> <li>- The Extension Officer is usually responsible for providing market information, facilitating the development and maintenance of infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>- It seems as if conditional credit for one production season, with the farmers' productive capacity as security, may be one of the better alternatives.</li> </ul>

	<p>imported from other areas, e.g. manufactured consumer items and dietary staples</p> <p>The catalyst to efficient marketing service is the extension officer, working with the producers in the farming households.</p> <p>Traders function in the remotest and least accessible areas where government or co-operative machinery frequently does not reach, thus providing market channels for rural surpluses, and often also fulfilling the consumption needs of the rural communities by selling consumer goods.</p> <p><b>Marketing Services include:</b></p> <ul style="list-style-type: none"> <li>- the grading standards required and equipment needed</li> <li>- storage requirements in a particular target area i.e. associated with depots</li> <li>- opportunities for increased local marketing of produce</li> <li>- infrastructure required for local marketing i.e. roadside stalls and public markets</li> <li>- opportunities for marketing outside the target area</li> <li>- means of privatizing market functions, in particular transport and storage arrangements</li> <li>- the timeliness of payment for produced delivery into the controlled marketing system</li> <li>- legal constraints that prohibit the sale of agricultural produce within a region</li> </ul> <p>The opportunities afforded by mobile telephones and Internet access are beginning to be exploited to determine market prices and selling strategies.</p>	<p>and transportation.</p> <ul style="list-style-type: none"> <li>- Many of the rural household farming communities indicate that marketing of their farm produce is a major problem for them. Farmers were unaware of simple marketing channels after successful harvesting of their crops.</li> <li>- Markets provide services, e.g. selling or serving cooked meals and locally made beer, barbering and the repair of bicycles, watches and shoes.</li> <li>- Farmers are hampered by a lack of credit facilities to finance input purchases. Banks do not rank high in the farmers' preference for sources of credit, private lenders (particularly friends and family members) do, as do tribal authorities.</li> </ul>	
Market Agents	<p>There is a need, particularly for larger schemes, to investigate and establish marketing partnerships with traders and wholesalers, including possible processing of crops on or near the irrigation scheme.</p> <p>Extension services is the provision of marketing knowledge.</p>	<ul style="list-style-type: none"> <li>- The lack of comprehension of the details of markets, formation of co-operatives and setting of competitive prices, credit selling/buying and profit margins means that extension-marketing specialists have not been successful in the education of farmers about rural market systems.</li> </ul>	
Transport	Need to improve quality and delivery time		

Topics	Issues	Background	Possible Solutions
<b>PRODUCTION</b>			
Crop Selection	<p>A farming system is made up of the food and cash earning activities of a farming household. Irrigation is only one activity. The unit of production may not be the same as the unit of consumption.</p> <p>Knowledge of present cropping patterns, including inputs, yields and constraints is important for future planning and rehabilitation. The most important crops grown in order of importance are cabbages, tomatoes, onions, maize, spinach, beans beetroot, potatoes and carrots. Probably because of the greater emphasis on higher value vegetable crops and "green mealies".</p> <p>Local observations by extension staff, nearby commercial farmers and subject matter specialists can often provide a useful guideline on the gap between present and potential yields as a basis for assessing viability.</p> <p>The success of the present and proposed cropping programme will depend not only on agronomic and marketing factors, but also on issues of food security, income needs and the importance of irrigation in the household farming system. Discussions with WUAs on these issues will assist farmers to focus on their real needs.</p> <p>On large schemes, the cropping programme should make allowance for a break in irrigation of approximately one month, so that the water distribution system and irrigation equipment can be shut down for maintenance</p> <p>Livestock may play an important role in the local economy. Integration of livestock with irrigated crops may be important for the provision of animal traction and manure, as well as improved animal nutrition through use of crop residues and possibly grain for livestock fattening and dairy production.</p>	<ul style="list-style-type: none"> <li>- On average, households produce only 37% of their maize grain requirements. Maize and spinach are mainly grown for home consumption.</li> <li>- Plot holder households consume tomatoes and cabbage because the quality of these products was usually poor. Producers of cabbage and tomatoes experience major difficulties with the effective control of pests and diseases and with maintaining suitable growing conditions.</li> <li>- Respondents perceive that tomatoes and onions were the most profitable crops to grow. Crops favored for the future were potatoes, beetroot, carrot, green peppers and chillies.</li> <li>- Without exception plot holders reported that most of their fruit gets stolen by children who pick the fruit before it is ripe.</li> <li>- There is a significant positive relationship (<math>P=0.05</math>) between the number of years a plot holder has been a member of the project and the number of crops he or she plants. This suggests that new entrants to the project usually try out a limited number of crops during the start-up period, adding new crops to the spectrum as they gain experience.</li> <li>- It appears that some farmers who have irrigation water available did not utilize it. As shown in the case studies, there is often very little reliable information on crop yields, especially from schemes, which have ceased to function. If data is unavailable it may be necessary to transpose data by interpolation from nearby similar climatic areas.</li> <li>- Data bases from Geographical Information System, such as that available from the Institute of Soil, Climate and Water, as well as from certain universities, are usually able to supply climatic and other data.</li> </ul>	<ul style="list-style-type: none"> <li>- Selecting the right crops for an area will improve production and livelihoods.</li> </ul>

	<p>Climate: In order to establish the suitability of present and proposed crops, information is required on temperature, rainfall and consumptive use of water through available data.</p> <p>Farming constraints: Before considering rehabilitation, it is important to clearly establish present constraints on crop production, such as pests and diseases endemic in the area, climate, labour, draught power, inputs and marketing, and agricultural services which unless remedied, are likely to continue to be experienced in the future.</p>		
Production	<p>The mean yields of different crops were determined using information supplied by plot holders. In order to assess these, they are compared with average commercial yields and optimum yields reported.</p> <p>Overall, nearly two-thirds of the gross value of produce was realized through sales and the plot holding households consumed one-third.</p> <p>The bulk of the produce was not of a good enough quality to be sold and ended up on the table of the plot holder. (Evaluation of Masizake Agricultural Project, 1998.)</p> <p>That lack of rural infrastructure such as power supply, communication facilities, domestic water supply etc. is proving to be extremely expensive in terms of production.</p>	<ul style="list-style-type: none"> <li>- Comparisons of the mean yields obtained by plot holders with average commercial farmer yields and optimum yields shows that, on average, plot holders are not doing very well.</li> <li>- From the range of yields obtained by plot holder, large differences in performance among plot holders is evident.</li> <li>- The data show that the best farmers are able to achieve yields that are on par with those of commercial farmers in South Africa for most crops. Low levels of nutrient application, the use of suspect planting material, deficient knowledge and utilization of pest control practices, and problems with water supply were the major agronomic factors that must be overcome to improve crop growth and yields. (Evaluation of the Masizake Agricultural Project, 1998.)</li> <li>- Most unemployed young people in the prime of their youth do not wish to stay in the rural areas where infrastructure is lacking. Hence, they migrate to towns to seek employment, leaving old people in the villages who are usually too weak to cultivate the land effectively due to lack of labour.</li> <li>- Irrigated farming income per household for food plot owners, as well as so-called commercial farmers, remains too low for them to meet their subsistence requirements and generate the surplus needed for development.</li> </ul>	<ul style="list-style-type: none"> <li>- If small holders are somehow enabled to move up to the net income/hectare curve for commercial crops then, even with their small holdings, upward ratchets will set in and farmers would be willing to increase their investments in improving the quality of irrigation as in sugar projects in Kwazulu-Natal and Mpumalan</li> <li>- The "down-ward ratchets" must be turned around: total dependence → water supply infrastructure dilapidated → ineffective water management → low production levels → little knowledge of crop production or irrigation → ineffective extension → lack of markets and credit → lack of markets and credit → difficulty in sourcing inputs → expensive and ineffective mechanisation services → unprepared fencing → damaged soils.</li> <li>- Many observers focus on high productivity of tiny holdings and this is supported by a good deal of empirical evidence. A case study of the Rural Women's Association shows the value of productivity/ha to be remarkable for manually irrigated vegetable crops on 100 square meter plots.</li> <li>- Emphasis needs to be placed on literacy training in the black farming community.</li> <li>- Extension officers should also receive substantially more human relations training. There should also be more female extension workers to cater for the needs of female farmers.</li> <li>- Recommendations:             <ul style="list-style-type: none"> <li>- Departments should join with non-government organisations and other organised initiatives to combat illiteracy in the black farming</li> </ul> </li> </ul>

			<p>community. Extension officers can play an active role in making a connection between literacy instruction and farming.</p> <ul style="list-style-type: none"> <li>- More effort must be made to teach farmers skills of farm management and marketing.</li> <li>- Radio programmes on farming advice should be sensitive to the educational level and time frames of the farmers. These programs should serve either as introductions or follow-up to hands-on training workshops. The presenters of the radio programmes should also be well trained in mass communication and have a clear understanding of the audience they are dealing with.</li> <li>- Extension departments should train more women extension officers so that women farmers can get more extension help.</li> <li>- Government policy-makers should be made aware of the financial and social needs of the small-scale commercial farmers. The government must re-organize its priorities and reconsider their view of small-scale commercial farming. This needs to be seen as permanent practice, not just another step towards transforming small-scale farming into large-scale, capital-intensive farming.</li> <li>- Agricultural colleges, universities and other training institutions could benefit farmers by encouraging a free flow of information on farmers' needs and of research results back to farmers. This could be achieved by involving extension officers, especially those who are in direct contact with the farmers, in different stages of research. Agricultural educational institutions would also need to work with different communications media in reaching out to farmers. Short and simplified training courses should also be made available to all levels of farmers.</li> <li>- In training agricultural extension officers, colleges should emphasize skills such as needs assessment and human relation training. During in-service training, extension officers should be encouraged to value farmers' perceptions.</li> <li>- Constant hands-on workshops and the opportunity to visit and learn from successful farmers in other places may contribute to meeting the goals of extension.</li> </ul>
--	--	--	---

<p><b>Irrigation Costs</b></p>	<p>Most plot holders construct small level basins in which to plant their crops. (Evaluation of Masizake Agricultural Project, 1998.)</p> <p>Technology can make access to water easier and less laborious, it can also make the use of water more efficient and, thereby, small sources of water can be used.</p> <p>Pump irrigation schemes are more costly and difficult to operate and maintain than gravity schemes.</p>	<ul style="list-style-type: none"> <li>- At present, the irrigation services offered by many schemes is quite low and, in most schemes, plot holders pursue low-input subsistence farming, yielding low net income per hectare</li> <li>- Since holdings are very small, the net income from irrigated farming per household is very low and can meet only a small part of their basic livelihood needs. In this dynamic, it is futile to expect scheme members to self-manage and self-finance the irrigation scheme for in most cases, management transfer will leave them in greater misery and red.</li> </ul>	<ul style="list-style-type: none"> <li>- There are excellent opportunities for the uptake of affordable irrigation technology.</li> <li>- Farmers in small-holder schemes need and want support systems that go far beyond just irrigation if they are to significantly improve their livelihoods.</li> </ul>
--------------------------------	---	--	---

Topics	Issues	Background	Possible Solutions
PRODUCTION (continued)			
<p><b>Mechanisation, Technology &amp; Access Roads</b></p>	<p>It is important to assess farmer resources in terms of available equipment and tools for irrigation farming.</p> <p>The improvement, preservation and maintenance of common roads, bridges and thoroughfares are a vital component to the success of the estate, scheme etc.</p> <p>Some community farmers see wealthy commercial farms with sophisticated sprinkler irrigation and perceive technology to be the gateway to wealth.</p> <p>Some plot holders have prepared their land by hand. They use a spade or a garden fork to break the sod of the previous crop and a rake for seedbed preparation.</p> <p>A minority of plot holders hire labour for land preparation.</p> <p>Technology can only give improved profits when it is combined and managed with all the other inputs.</p> <p>Often it requires the collection of marketable produce at a central place, enabling bulk transport.</p>	<ul style="list-style-type: none"> <li>- Partly as an outcome of the 'estate-type' farming mode the parastatals adopted, African small-holder irrigated farming has turned into and non-viable, high cash-cost enterprise. A major contributor to the high cash cost is the high level of mechanisation of farm operations. Parastatals like the ARDC in South Africa used heavy equipment for ploughing and land preparation, spraying and harvesting. As a result, the tradition of using animal power has disappeared in many small holder schemes.</li> <li>- With the withdrawal of parastatals, accessing equipment at affordable rates has emerged as a major problem. The development of local equipment rental markets has been slow and variable, and rental rates are high. This has squeezed the small holder farm economy from two sides: the margins for irrigated farming have been hit and working capital requirements have increased.</li> <li>- The small holder-schemes in the former homelands of South Africa have a lot in common with those on the White Nile in Sudan. Both have a long history of dependency on parastatals; both have extremely high levels of mechanisation of small-holder cultivation, both face poor infrastructure and institutional arrangements for input supply and output marketing for small holder farmers.</li> </ul>	<ul style="list-style-type: none"> <li>- When situated in deep rural areas, the opportunities for local marketing may be limited and transportation of produce over medium to long distance becomes necessary.</li> <li>- The major objective of the supply of mechanisation services is to alleviate bottlenecks in the preparation of farmland and the transport of inputs and crops.</li> <li>- The following design criteria need to be considered:             <ul style="list-style-type: none"> <li>- The mechanisation provided should be appropriate, with due regard being given to employment creation.</li> <li>- The type of machinery utilized should allow for the participation of local contractors in respect of both cost and appropriateness.</li> <li>- The viability of the mechanisation services for the particular areas should be assessed.</li> <li>- Effective service and maintenance support should be provided.</li> <li>- The setting up of local contractors should have priority and these services should only be undertaken by the public sector in extreme circumstances on an interim basis a then not in competition with the private sector.</li> </ul> </li> <li>- Often the solution for small-scale farming and community gardens has been to scale-down first world technology.</li> </ul>
<p><b>Input Costs</b></p>	<p>Irrigated crop production usually makes use of high levels of inputs. These inputs include planting materials (hybrid seed, vegetable transplant), chemical fertilisers, chemicals for plant pest and weed control and the use of mechanised implements in land preparation, cultivation and harvesting. In order to maintain high levels of production and quality, it is important that farmers have ready access to all the necessary inputs.</p> <p>During the start-up period of projects, participants are trained in the use of chemical</p>	<ul style="list-style-type: none"> <li>- The use of chemical fertilisers is widespread during the first two years, mainly because projects made these available free of charge. When this support was discontinued use of chemical fertilisers declined to only 29% of interviewed plot holders in 1997. This decline appears to result from efforts by plot holders to minimize input costs.</li> <li>- The reluctance of growers to spend cash on inputs may indicate that they consider crop production on the project to be subject to high risk.</li> </ul>	<ul style="list-style-type: none"> <li>- The positive relationship between money invested in operational costs and production shows that plot holders benefit from investing in production inputs.</li> <li>- The objective of providing for the supply of inputs is to ensure that users have easy access to a complete package of inputs. Within a target area, the establishment of a depot or service center could be an effective vehicle to ensure access. Regarding the supply of inputs and the establishment of service centers, the following guidelines are proposed:</li> </ul>

	<p>fertilisers. A number of farmers experiment with alternative sources of plant nutrients.</p> <p>Mean total operational costs per plot holder amounted to R172.17. More than 80% of these costs were incurred as a result of the purchase of planting material (seed and seedlings) and payment of the project's water supply charge (Evaluation of Masizake Agricultural Project, 1998.)</p> <p>Fertilisers and plant protection chemicals, which are important cost items in commercial vegetable production, contribute very little to total operational costs. (Evaluation of Masizake Agricultural Project, 1998.)</p>	<ul style="list-style-type: none"> <li>- In the case of small scale irrigated farmers on schemes situated in rural areas, it may be necessary to arrange access to inputs through a central service managed by the Scheme, as was the case at most of the schemes in Former Ciskei and Transkei or through private entrepreneurs.</li> <li>- Merely changing the mode of management does not necessarily result in improved performance and withdrawal of state management before the necessary support services is in place and available can be counter-productive.</li> </ul>	<ul style="list-style-type: none"> <li>- Inputs must be available in the right form, at the right time and place.</li> <li>- The inputs should be suited to the particular environment</li> <li>- All inputs necessary for the types of crops grown or livestock held should be available.</li> <li>- The planning and design of service centers (depots, etc) must be sufficiently flexible to accommodate all present services and future development.</li> <li>- Design standards should be appropriate and functional.</li> <li>- The siting of the service centers should take cognizance of transport networks.</li> <li>- In view of the potential for privatization, depots should be affordable and land tenure implications noted.</li> <li>- In all cases, the capital requirements of facilities and infrastructure should be carefully analyzed in respect of internal and cross-border duplication.</li> <li>- The service center should be integrated with other services or projects.</li> <li>- The expansion and utilization of existing facilities (i.e. projects, settlement schemes and commercial facilities) should be considered.</li> <li>- Where possible, local skills and material should be used in the construction and management of depots.</li> </ul>
--	---	--	--

Topics	Issues	Background	Possible Solutions
<b>FINANCE</b>			
Scheme Costs	Rehabilitation cost of individual schemes	<ul style="list-style-type: none"> <li>- Economic viability of rehabilitation</li> <li>- Can rehabilitated schemes sustain themselves?</li> <li>- Subsidization of infrastructure development.</li> <li>- Consider benefits and costs of rehabilitation.</li> <li>- Assessment of operational, maintenance, production and running costs of schemes.</li> <li>- Can input and services costs be sustained.</li> </ul>	<ul style="list-style-type: none"> <li>- DWAF must subsidize development of infrastructure.</li> <li>- Financial records on schemes should be kept.</li> <li>- Cash flow and sensitivity analysis must be undertaken.</li> <li>- Cost-benefit approach should be employed to assess socio-economic profitability of schemes.</li> <li>- State must assist in upgrading infrastructure and equipment.</li> </ul>
Farmer Participation	Participation and consultation with supposed beneficiaries.	<ul style="list-style-type: none"> <li>- Certain schemes imposed without knowledge of socio-economic parameters.</li> <li>- No formally constituted water Users Association in some instances.</li> <li>- No strong leadership in farmer liaison committees</li> </ul>	<ul style="list-style-type: none"> <li>- There is need to transfer knowledge and technology to farmers.</li> <li>- Formation of Water User Association needs to be encouraged.</li> <li>- Adequate training of extension staff and farmer liaison committee leadership.</li> <li>- Access to opportunities for farmers should be equal.</li> </ul>
Farm Costs	Farmers face various cost elements.	<ul style="list-style-type: none"> <li>- Farmers face high transaction and transport costs due being located in remote areas relative to markets.</li> <li>- Costs of irrigation technology are very high.</li> <li>- High operational, maintenance and running costs.</li> </ul>	<ul style="list-style-type: none"> <li>- Cost-benefit approaches should be employed.</li> <li>- Government Financial Support essential.</li> </ul>
Capital	Acquisition Of Capital	<ul style="list-style-type: none"> <li>- Difficulty of small holder schemes of accessing credit.</li> <li>- Absence of credit markets.</li> <li>- Shortages of operating and fixed capital for irrigation development.</li> <li>- Lack of available equity capital as source of financing.</li> <li>- Lack of Government Financial support.</li> <li>- Farming infrastructure frequently involves high-cost systems and this result in farmers involved in high levels of indebtedness.</li> <li>- Discrimination against small farmers by lending agencies due to high risk factors.</li> <li>- Lack of tenure security and financial institutions do not accepts title as collateral unless land is saleable.</li> </ul>	<ul style="list-style-type: none"> <li>- Financial institutions must revamp lending policies to accommodate small farmers as well.</li> <li>- Small farmers need to have access to credit market.</li> <li>- Guidance should be provided to small farmers on most suitable way of financing.</li> <li>- Government financial support necessary.</li> <li>- Resolve tenure security.</li> </ul>
Operating Costs	Management Fees	<ul style="list-style-type: none"> <li>- The larger the schemes involved the higher management fees to be paid.</li> </ul>	<ul style="list-style-type: none"> <li>- Adopt effective and efficient management systems</li> </ul>

		- Management fees are high as at times farmers play a passive role.	
--	--	---	--

Topics	Issues	Background	Possible Solutions
<b>FINANCE (continued)</b>			
Equipment Costs	High mechanisation costs leads to high cash cost.	<ul style="list-style-type: none"> <li>- Irrigation farming is now high cash-cost enterprise due to high level of mechanisation of farm operations.</li> <li>- Accessing equipment at affordable rates is a major problem and rental rates are high.</li> <li>- Working capital requirements have increased.</li> <li>- High maintenance costs regarding equipment</li> </ul>	<ul style="list-style-type: none"> <li>- Farmers need to have access to affordable equipment.</li> <li>- Affordable technology cannot solve all farming problems it must be combined with management and other inputs.</li> <li>- Creation of proper and affordable equipment rental market.</li> </ul>
Input Costs	Input costs	<ul style="list-style-type: none"> <li>- Irrigation crop production involves high levels of inputs e.g. chemical fertilisers, planting materials, mechanised implements etc.</li> <li>- Privatization of input supply leads to high input costs</li> <li>- High transaction costs due to usage of utilities such as power supply, communication facilities, domestic water supply etc.</li> <li>- High cost of pump schemes</li> </ul>	<ul style="list-style-type: none"> <li>- Improve supply and funding of inputs and production assets to farmers.</li> <li>- Provide mechanisation, effective service and maintenance support to farmers.</li> <li>- Make government policy makers aware of the financial, social and technical needs of farmers.</li> </ul>

Topics	Issues	Background	Possible Solutions
<b>MANAGEMENT</b>			
<b>Irrigation Scheme Management</b>	Effective and proper management of schemes.	<ul style="list-style-type: none"> <li>- Lack of properly qualified scheme management, water bailiffs, extension staff as well as Farmers.</li> <li>- Centralization of water management and water service cost recovery.</li> <li>- Centrally (externally) managed irrigation scheme management is a problem.</li> <li>- Water supply and infield irrigation systems are not management friendly.</li> </ul>	<ul style="list-style-type: none"> <li>- Training should be the basis of any well planned institutional upgrading.</li> <li>- Extension services should be improved regarding small-scale farming and be well oriented to irrigated agriculture.</li> <li>- Decentralization and transfer of power to local management and decision making structures such as WUA and CMA.</li> <li>- Farmers must not play a passive role they must get involved in decision making.</li> </ul>
<b>Management Structures and Systems</b>	Effectiveness of management systems and structures.	<ul style="list-style-type: none"> <li>- Not all five management systems are ideal for small-scale farmer irrigation schemes.</li> <li>- Many scheme Managers are well versed in the technical aspects of irrigation and lack necessary social skills.</li> <li>- Lack of CMA and WUA a regional and local level.</li> </ul>	<ul style="list-style-type: none"> <li>- Focus should be on jointly managed schemes, small community schemes and entrepreneurial.</li> <li>- Small-scale development need greater participation from farmers in decision-making process.</li> <li>- New management entities must be established at regional and local level and must have a decentralized and participatory approach to decision-making.</li> </ul>

## REFERENCES

- 1 Affordable irrigation Technologies for smallholders: opportunities for technology adaptation and capacity building, 2000. Food and Agriculture Organisation of the United Nations, Rome.
- 2 **ATP Bennie, MJ Coetzee, R van Antwerpen, LD van Rensburg & R du T Burger, 1988.** N' Waterbalansmodel vir Besproeiing Gebaseer op Proefielwatervoorsieningstempo en Gewaswaterbehoefes. WNK Verslag Nr. 144/1/88.
- 3 **Backeberg G and Groenewald J A, 1995.** Lessons from the economic history of irrigation development for smallholder settlement in South Africa. Water. Agrekon, Vol 34 No 4.
- 4 **Backeberg GR, Bembridge T J, Bennie ATP, Groenewald JA, Hammas PS, Pullen RA and Thompson H, 1996.** Water Research Commission Appendices to Policy Proposal for Irrigated Agriculture in South Africa. Discussion Paper. WRC Report No. KV 96/96.
- 5 **Bembridge T J, 1991.** Technology transfers in small – scale dryland crop production: Future challenges. Development South Africa. Vol 8, No 4.
- 6 **Bembridge T J, 2000.** Guidelines for rehabilitation of small-scale farmer irrigation schemes in South Africa, 2000. WRC Report No. 891/1/00.
- 7 **Bembridge TJ, 1987.** An overview of the capacity of existing institutions and structures in the less developed areas of Southern Africa to achieve rural development. Development south Africa. Vol 4, no. 4.
- 8 **Breytenbach W J. 1984.** The new South African Constitution and its implications for development. Development South Africa. Vol 1, No. 1.
- 9 **Bromley D W, 1982.** Improving Irrigation Agriculture: Institutional Reform and the Small Farmer. World Bank Staff Working Papers, No 531.
- 10 Business plan for NCORA / QUMANCO irrigation trust, 2000. Ncora Estates South Africa.
- 11 Can poor farmers in South Africa shoulder the burden of irrigation management? <http://www.cgiar.org/iwmi/home/IMTSaf.htm>
- 12 Checklist for the Rehabilitation of Small Scale Farmer Irrigation Schemes, Draft 1999. ARC .LNR.
- 13 Checklist to Assist Preparation of Small-Scale Irrigation Projects in Sub-Sahara Africa, March 1998. DFID.
- 14 **Crosby C T, de Lange M, Stimie C M and van der Stoep I, 2000.** A review on planning and design procedures applicable to small-scale farmer irrigation projects. 2000. WRC Report No. 578/2/00.
- 15 **Crosby, C. T. and Crosby, C. P., 1999.** Sapwat , a Computer Program for Establishing Irrigation Requirements and Scheduling Strategies in South Africa. WRC Report No 624/1/99.
- 16 **De Lange M, Adendorf J and Crosby C T, 2000.** Developing Sustainable Small-scale Farmer irrigation in poor rural communities: Guidelines and checklists for trainers and development facilitators, 2000. Water Research Commission Report No 774/1/00.
- 17 **De Lange Mara, 1994.** Small – Scale Irrigation in South Africa. WRC Report no 578/1/94.
- 18 **De Lange, M, Adendorf, J and Crosby, C.T, 2000** Developing Sustainable Small- Scale Farmer Irrigation in Poor Rural Communities: Guidelines and Checklist for Trainers and Development facilities. WRC Report No. 774/4/00. Water Research Commission, Pretoria.
- 19 Determination of an Equitable tariff structure for the irrigation schemes at Keiskammahoek, Ncoro, Malenga and Quamata, 2000. Dep. of Water Affairs and Forestry, King Williamstown.
- 20 **Du Plessis F J and van der Stoep, 2001.** Evaluation of the Appropriateness of Micro Irrigation Systems in Small- Scale Farming. WRC Report No. 768/1/01.
- 21 **Eckert J B, Hamman J N and Lombart J P, 1996.** Perceiving a new future: Empowering farmworkers through equity sharing. Development South Africa. Vol. 13, No. 5.
- 22 **Eicher C K, 1999.** Institutions and the African Farmer. CIMMY, Sustainable Maize and Wheat Systems for the Poor.
- 23 **Erskine J M, 1985.** Rural development : Putting theory into practice. Development South Africa, Vol 2, No 2.
- 24 Establishing a Water User Association, guide 3 in the CMA/WUA guide series. Department of Water Affairs and Forestry.

- 25 Evaluation of Masizake Agricultural Project, 1998. ARDRI, University of Fort Hare, Alice.
- 26 **Fenyesh T I, 1985.** Aspects of agricultural marketing in Lebowa. Development South Africa. Vol 2 , No 3.
- 27 **Funnell D C, 1994.** Intervention and Indigenous Management. The geography of small scale irrigation development in Morocco and Swaziland. Land Use Policy, Vol. 11 No1.
- 28 **Kamara A, Van Koppen B and Magingxa L, 2001.** Economic viability of Small- Scale Irrigation Systems in the context of Withdrawal: The Arabi Scheme in the Northern Province of South Africa. WARFSA/Waternet Symposium: Integrated Water Resource Management, Cape Town RSA.
- 29 **Kirsten J F and Van zyl J, 1996.** The cost and benefits of providing agricultural support to services to rural households in the developing areas of South africa. Development South africa, Vol 13, no 3.
- 30 **Latt E A and Nieuwoudt W L, 1988.** Identification of Plot size effects on Commercialization of Small – scale agriculture in KwaZulu. Development South Africa. Vol. 5, No. 3.
- 31 **Maginga L.** Livelihood Strategies and Irrigation: Irrigation management Transfer in Boskloof Irrigation Scheme (South Africa). Submitted as Msc thesis in Wageningen University
- 32 **Makhura M and Mamabola M, 2000.** Gender and socio – economic issues in small scale irrigated agriculture: A literature survey on the Olifants basin, RSA, and SADC. International Water Management Institute (IWMI), Rome Italy.
- 33 Maps of major irrigation Schemes in the Eastern Cape. ?
- 34 **Moore G N & Nieuwoudt W L, 1996.** The prospects for improving Institutional arrangements and land use in South Africa. Development South Africa. Vol 13, No 1.
- 35 **Ncora irrigation scheme, full report, 1996.** Faculty of Agriculture and Ardri, University of Fort hare.
- 36 **Perret S R, 2002.** Identification of plot irrigation schemes as case studies in the Eastern Cape: short note on selection criteria. CIRAD and University of Pretoria.
- 37 **Perret S R, 2001.** New water policy, irrigation management transfer and small holding irrigation schemes in South Africa: institutional challenges. CIRAD and University of Pretoria.
- 38 **Perret S R, 2002.** A Simulation-Based Approach to access the Economic viability of smallholdings irrigation schemes in South Africa: Coseptualisation and first Implementation, 2002. Dep. of Agric . Economics, Extension & Rural Development, University of Pretoria.
- 39 **Perret S R, 2002.** Supporting decision making on Rehabilitation and management transfer of Government smallholding irrigation schemes: the smile approach. University of Pretoria / CIRAD.
- 40 **Perret S R, 2002.** Water policies and smallholdings irrigation schemes in South Africa: a history and new institutional challenges, CIRAD and University of Pretoria. Water Policy Journal.
- 41 **Proceedings of the Southern African irrigation Symposium, 1991.** The Water Research Commission, Pretoria.
- 42 **Proceedings of the Southern African Irrigation Symposium.1991.** WRC Report No TT 71/95.
- 43 **Rogerson C M, 1993.** Urban agriculture in South Africa: Policy issues from the international experience. Development South Africa. Vol 10, No 1.
- 44 **SA Waterbulletin, 1995.** Ground Water and Water Supply. Volume 21 No. 5, September / October 1995.
- 45 **Schulze RE, 1989.** ACRU: Backgrounds, Concepts and Theory. WRC Report No. 154/1/89.
- 46 **Schulze RE, George WJ, Lynch SD and Angus GR, 1989.** ARCU – 2: User manual. WRC Report 154/2/89.
- 47 **Shah T, Van Koppen B, Merry D, de Lange M and Samad M, 2000.** Institutional Alternatives in African Small holder Irrigation: Lessons from international Experience in Irrigation Management Transfer. Draft June 2000. International Water Management Institute, Colombo, Sri Lanka.
- 48 **Shulze, R. E., 1997.** South African Atlas of Agrohydrology and -Climatology. Department of Agricultural engineering. University of Natal, Pietermaritzburg. South Africa.

- 49 **Svensden M, 2001.** IMT Conference. Synthesis note for Theme 6: Financing Irrigation. IMT-Moderator [IMT-Moderator@fao.org](mailto:IMT-Moderator@fao.org)
- 50 **Van Avebeke W, M<sup>o</sup>Marete C K, Igodan C O and Belete A, 1998.** An investigation into food plot Production at irrigation Schemes in Central Eastern Cape, 1998. WRC Report No 719.1/98. ARDRI, Uneversity of Fort Hare.
- 51 **Van Rooyen C J, Vink N and Christodoulou N T, 1987.** Access to the agricultural market for small farmers in South Africa: The farmer support programme. Development South Africa. Vol 4, No. 2.
- 52 **Van Rooyen J Vink N & Malatsi M,1993.** Agricultural change, the farb sector and the land issue in South Africa. Vol 10, No. 1.
- 53 **Van Rooyen J,1984.** Agricultural economic research in less developed countries: Afarm system approach. Development South Africa. Vol 1, No. 1.
- 54 **Van Schalkwyk H D & Groenewald J A,1993.** Agricultural land price and quality. Development South Africa. Vol 10, No. 3.
- 55 **Van Zyl J, Barnard R and Van Zyl J, 1996.** Agricultural education and training in South Africa: An overview. Development South Africa. Vol 13, No. 5.
- 56 **Vanassche FMG and MC Laker, 1989.** Studies on Irrigation Management Based on PAWC and Soil Water Monitoring, WRC Report No. 166/1/89.
- 57 **Vermillion D L and Sagardoy J A, 1999.** Transfer of irrigation management services. Guidelines. FAO irrigation and drainage paper 58.IWMI Rome, Italy.

### LATE REFERENCES (not in literature review)

- 58 **Albinson, B. and Perry, C.J.:** "Fundamentals of Smallholder Irrigation: The Structured System Concept" 2002, p. 26
- 59 **Sakthivadivel, R., Loeve, R., Amarasinghe, U.A. and Hemakumara, M.:** "Water Scarcity and Managing Seasonal Water Crisis: Lessons from Kirindi Oya Project in Sri Lanka", 2001, p. 40.
- 60 **Renwick, Mary E.:** "Valuing Water in Irrigated Agriculture and Reservoir Fisheries: A Multiple-Use Irrigation System in Sri Lanka", 2001, p. 44.
- 61 **Vermillion, Douglas L., Samad, M., Pusposutardjo, S., Arif, Sigit S. and Rochdyanto, S.:** "An Assessment of the Small-Scale Irrigation Management Turnover Program in Indonesia", 2000, p. 48.
- 62 **Abernethy, Charles L., Sally, H., Lonsway, K. and Maman, C.:** "Farmer-Based Financing of Operations in the Niger Valley Irrigation Schemes", 2000, p. 44. ISBN.
- 63 **Bandaragoda, D.J.:** "Insitutional Change and Shared Management of Water Resources in Large Canal Systems: Results of an Action Research Program in Pakistan", 1999, p. 40.
- 64 **Vermillion, D. and Samad, M.:** "Assessment of Participatory Management of Irrigation Schemes in Sri Lanka: Partial Reforms, Partial Benefits", 1999, p. 40.
- 65 **Sakthivadivel, R., Thiruvengadachari, S. and Amarasinghe, Upali A.:** "Modernization Using the Structures system Design of the Bhadra Reservoir Project, India: An Intervention Analysis", 1999, p. 32.
- 66 **Bastidas, Elena P.:** "Gender Issues and Women's Participation in Irrigated Agriculture: The Case of Two Private Irrigation Canals in Carchi, Ecuador", 1999, 1999, p. 32.
- 67 **Levine, G., Galvan, A.C., Garcia, D., Garces-Restrepo, C. and Johnson, S.:** "Performance of two Transferred modules in the Lagunera Region: Water Relations", 1998, p. 24.
- 68 **Kloezen, W.H., and Garces-Restrepo, C.:** "Assessing irrigation performance with comparative Indicators: The case of the Alto Rio Lerma Irrigation District, Mexico", 1998, p. 52
- 69 **Bandaragoda, D.J.:** "Need for institutional impact assessment in planning irrigation system Mordenisation", 1998, p. 28.
- 70 **Bandaragoda, D.J.:** "Design and practice of water allocation rules : Lessons from Warabandi in Pakistan's Punjab", 1998, p. 36.
- 71 **Perry, C.J. Rock, M. and Seckler, D.:** "Water as an economic good: A solution, or a problem?", 1997, p.20.
- 72 **Sakthivadivel, R., Fernando, N. and Brewer, J.D.:** "Rehabilitation planning for small tanks in Cascades: Methodology based on rapid assessment", 1997, p. 42.

- 73 **Starkloff, R.:** Farmers perceptions of of the social mobilisation of water users organisations in the Sindh, Pakistan( Pakistan country No. 9)", 2001, p. 76.
- 74 **Molden, D., Amarasinghe, U. and Hussain, I.:** " Water for rural development: Background paper On water for rural development prepared for the World Bank", 2001, p. 96.
- 75 **Mpahlele, R.E., Malakalaka, T.M. : and Hedden-Dunkhorst, B.:** " Characteristics of Smallholders irrigation farming in South Africa: A case study of the Arabie-Olifants River Irrigation scheme
- 76 **Hecht, R.:** Land and water rights and the desing of small scale irrigation projects: The case of Baluchistan
- 77 **Zapanta, L.S., Margos A.P., Padilla, J. Tanoy, D. and Torres, A. A.:** " Services of provincial Irrigation offices to communal irrigation systems in Western Visayas in the Phillippines"
- 78 **Lauraya, F. M., and Sala, R.A.L.:** " Performance determinants of irrigators associations in national Irrigation system in Bicol, Phillippines"
- 79 **Jungeling, I.:** Improving management of small scale irrigation system: a possible field of Assistance for Nongovernment organisation? Experiences from Hambantota District, Sri lanka"
- 80 **Abeyratne, S.:** " Rehabilitation of small scale irrigation systems in Sri Lanka: State policy and practice in two systems
- 81 **Upasena, W.J.J., Brewer, J.D. and Azharul Haq, K.:** " Monitoring farmers involvement in Rehabilitation : Phase 1. The case of five irrigation schemes under the national irrigation project", IRMU Research paper.
- 82 **Wijayaranta, C.M. Pintor, E.M., Valdez, D.M., Laitos, W.R., and Solis, V.V.:** "Farmers Organising Farmers"
- 83 **Vermillion, D.:** " Irrigation management turnover: The shift from agency to local control. Quarterly journal of international agriculture" , 1994, No. 4.
- 84 **Bhutta, M. N., Vandervelde, E. J.:** " Equity of water distribution along secondary canals In Punjab, Pakistan. Irrigation and Drainage systems", 1992, 6(2): 161-177.
- 85 **Nijman, C.M.:** " Performance evaluation and control in water delivery decision-making processes: Who cares? Irrigation and drainage systems," 1992, 6(2): 85-112.
- 86 **Rural Urban Consultants:** Zanyokwe Irrigation Scheme, May 2001, Provincial Land Reform Office (Department of Land Affairs) Republic of South Africa

## ENDNOTE REFERENCES

---

<sup>1</sup> Cross, 1991: 72

<sup>2</sup> Dushmanitch & Nieuwoudt, 1994

<sup>3</sup> Lyne & Nieuwoudt, 1991

<sup>4</sup> Roth, 1993

<sup>5</sup> Moore, 1996

<sup>6</sup> Crosby, C.T., De Lange, M., Stimie, C.M. and van der Stoep I, 2000. A review on planning and design procedures applicable to small-scale farmer irrigation projects. 2000. WRC Report No. 578/2/00

<sup>7</sup> Ilaco (1985)

<sup>8</sup> Can poor farmers in South Africa shoulder the burden of irrigation management?  
<http://www.cgiar.org/iwmi/hhome/IMTSAf.htm>

<sup>9</sup> (FOA and ARDRI, 1996)

<sup>10</sup> Van Aveveke, W.M., Marete, C.K., Igodan, C.O. and Belete, A., 1998. An investigation into food plot production at irrigation Schemes in Central Eastern Cape, 1998. WRC Report No. 719.1/98. ARDRI, University of Fort Hare.

<sup>11</sup> Shah and Van Koppen 1999

<sup>12</sup> Crosby, C.T., De Lange, M., Stimie, C.M. and Van Der Stoep, I., 2000. A review on planning and design procedures applicable to small-scale farmer irrigation projects. 2000. WRC Report No. 578/2/00.

<sup>13</sup> Affordable irrigation Technologies for small holders: opportunities for technology adaptation and capacity building, 2000. Food and Agriculture Organization of the United Nations, Rome.

<sup>14</sup> Shah, T., Van Koppen, B., Merry, D., De Lange, M., and Samad, M., 2000. Institutional Alternatives in African Small holder Irrigation: Lessons from international Experience in Irrigation Management Transfer. Draft June 2000. International Water Management Institute, Colombo, Sri Lanka

<sup>15</sup> Can poor farmers in South Africa shoulder the burden of irrigation management?  
<http://www.cgiar.org/iwmi/home/IMTSAf.htm>

# **APPENDIX B**

**SUSTAINABLE LIVELIHOOD FRAMEWORK**

## SUSTAINABLE LIVELIHOOD FRAMEWORK

The sustainable livelihood framework has been developed by DFID teams over the last decade (Scoones, 1998) to address and link up different aspects of rural people's livelihood, and support its description and analysis:

- the set of assets (or capital) that people may use or mobilise, i.e. human capital (skills, health), social capital (local networks, relationships, trust, solidarity), physical capital (infrastructures, information, equipment), natural capital (natural resources, climate), and financial capital (stocks, stores, savings, cash, valuables), in order to develop
- livelihood strategies, which are the set of activity and income-related systems (farming, non-farming, off-farming, non-income related activities, non-activity related sources of income, etc.) that people develop purposively, in order to achieve
- livelihood outcomes, which are the objectives as set by the family and its head: securing an income, achieving food security, having a good social status within the community, sustaining natural resources, being part of and benefiting from a social network, etc.

Such system represents the inner operation of a household, which cannot be considered isolated from its environment since the performance of that system highly depends on:

- the vulnerability context, which represents the set of risks and uncertainties that may face the household, i.e. long term cycles (human ageing), seasonalities (crop rotations, stock reproduction, climate, etc.), trends (prices, markets, etc.), and shocks (human health, crop and animal diseases, economic shocks, job, drought, floods, hail, etc.);
- the economic, financial, political, social and institutional context, at local, provincial, national and even global levels.

This framework, although not specific to smallholder irrigation, served as a guideline for interviews and for structuring the data that were collected during semi-structured group discussions.

# APPENDIX C

SMILE

**SMILE: A DATA-CAPTURING AND SIMULATION PLATFORM (Perret, 2002; 2003; 2004)**

The Smile platform ([www.smile-cirad.co.za](http://www.smile-cirad.co.za)) has been used as a data capturing and analytical tool for the data collected in Zanyokwe.

Smile<sup>1</sup> consists of five input modules that form the basis of the information system, as interfaces for data capturing by the user (see figure 2). Each cost-generating item is listed in the "Cost" module. This module generates output variables that reckon the costs incurred by the scheme and its management (i.e. capital costs, maintenance costs, operation costs, personnel costs). Such information answer the question as to how much does it cost to operate the scheme in a sustainable manner (regardless of who is going to pay for it).

In the "Crop" module, each potentially productive and water-consuming crop is listed with its technical and economic features (e.g. management style, cropping calendar, water demand, yield, production and marketing costs). This module generates micro-economic output variables (e.g. gross and net margin par ha, and per m<sup>3</sup>) that allow comparative evaluation of crops in terms of profitability, land productivity, and water productivity.

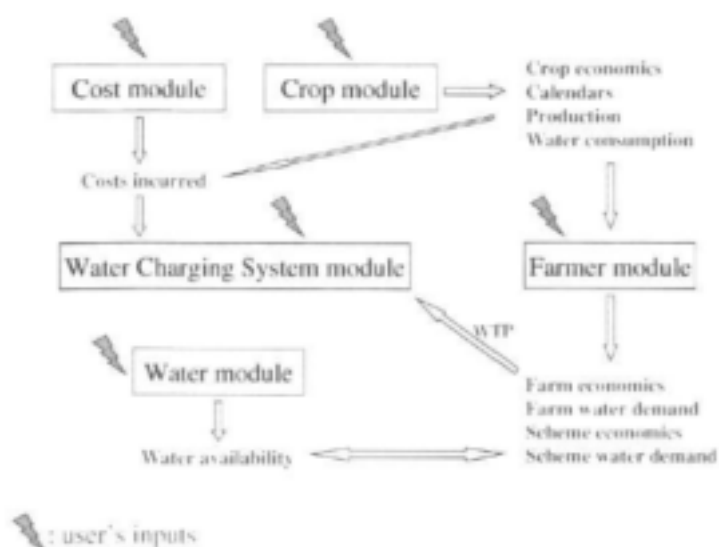
A "Farmer" module captures the different farmers' types, with their cropping systems (combination of crops that have been documented in the Crop module), average farm size, percentage of scheme's size, willingness to pay for irrigation water services. This module generates type-related output variables (e.g. aggregated profit per type, crop calendar) and scheme-related output variables (e.g. number of farmers, aggregated water demand) when combined with the "scheme" module.

A "Water" module deals with water balance at scheme level (rainfall and resource-availability patterns, crop consumptions).

---

<sup>1</sup> Smile stands for "Sustainable Management of Irrigated Land and Environment"

## SMILE: CONCEPTUAL FRAMEWORK (SOURCE: PERRET, 2003)



The "Farmer" and "Cost" modules are combined and used within the "Water charging system" module, and generates output variables on water pricing, tariff, cost recovery rate, contribution per type. This allows answering the question as to who may pay, and how much, for water services. It also generates some social and equity-related indicators, and resource-related indicators (e.g. total number of farmers, area per type, number of farmers per type, profit per type, profit at scheme level, total water consumption, overall weekly water balance).

The initial inputs (real data) form the base scenario. Additional scenarios may be tested through the capture of non-real / prospective data (e.g. alternative crops and cropping systems, emerging farmers' types, changes in scheme's management patterns, options for a charging system, new infrastructures, and the like).

# **APPENDIX D**

## **SUSTAINABLE LIVELIHOOD RESPONSES**

## 1 APPLYING THE SUSTAINABLE LIVELIHOODS FRAMEWORK

It must be noted here that not all topics of the SLF are listed here below. Some were not documented, since farmers did not find anything specific to mention about them. Also, some elements have already been mentioned in previous sections.

### 5.1 VULNERABILITY CONTEXT – TRENDS & CHANGES

Farmers are ageing. 3 recently died in group A. In group A, 5 youngsters left the scheme in one year, having found other job opportunities.

### 5.2 VULNERABILITY CONTEXT – SHOCKS & RISKS

#### Human health shocks

Farmers do not see any real issues on health, just ageing.

#### Natural shocks (drought, water supply, hail...)

Farmers said flooding is a problem. Riverbanks plus some land has been taken away last year (2003). Sometimes drought is happening.

#### Conflicts

Conflicts occur between groups A and B. It goes up to the chief sometimes or even to the police when insults are reported. Real reasons for split-up and persisting conflicts remain unknown. It's a very sensitive topic, especially from group A view point (very offensive when it comes to this topic). It looks as if after the split-up and whatever the reason of it, a feeling of competition and jealousy grew between the groups.

#### Crop / animal health shocks

Farmers reported some damages on cabbage that happened once (summer cabbage is hardly possible owing to diseases).

#### Seasonality of prices

Prices may go down slightly in summer, when there's plenty of products. Electricity bills vary along the year according to pumping needs.

#### Seasonality of production

It's quite even all year round. But farmers mentioned that there's more maize in summer, because cabbage is a problem then.

#### Seasonality of employment opportunities

Farmers find it quite evenly spread. Lots of labour is required for planting seedlings and harvesting.

#### Seasonality of food supply

Some farmers are struggling just before harvests.

#### Seasonality of cash availability

Sometimes farmers get little money back from the account, owing to bad harvests.

### 5.3 HUMAN CAPITAL

#### Skills

Farmers believe they have a good background. According to them, training by the Department of Labour has been very effective. Some said they still lack skills on potato cropping.

#### Knowledge

They believe that butternut is the best crop in terms of easiness: no diseases, not demanding much water. But the best selling and most profitable is cabbage. Green mealies also sell very well. Group B uses seedlings for every crops, even for maize, since birds eat the seeds.

#### Quality of labour

Labour is basic. Unskilled labour is paid at about R15 to R20 per day.

#### Availability / quantity of labour

Farmers said that there's plenty available around, from neighbouring communities.

#### Health

Farmers said are healthy (clinic nearby) but ageing.

#### Local leadership / management

Mphakati still keeps an eye from time to time, and there are now 2 co-chair of the common MC.

### 5.4 SOCIAL CAPITAL

#### Local networks

There are 2 groups, respectively internally strong and coherent, yet fighting / competing with each other.

#### Solidarity

In group B, there a lot but limited to the group (solidarity and mutual trust).

In group A, some of members cannot access irrigation (reasons unknown, too far? Not enough pipes?), farmers try to accommodate them into the group.

#### Collective action

About marketing, input supply, transport, pump, collective savings. Also some coordination, collective decision and action on cropping systems in group B (planting and harvesting dates).

It's the same in group A, the committee decides what and when to plant, in coordination with all farmers. Although they preferably farm their own plot as individuals, they prefer forming a group because (1) they can sell more easily to hawkers (larger quantities), (2)

they have a name, we are known (visibility), (3) being in a group is encouraging when any individual fails or perform less, (4) they order inputs and seedlings together (economy of scale).

#### Free riding behaviours

Not really. Within each group, farmers abide by the rules of the group.

#### Conflicts

Yes, between the 2 groups. Group B farmers believe that the split-up in two groups prevents from further problems and conflicts. They feel better being a smaller group. Group A farmers are very sensitive to that topic. They do not wish to talk about it.

The problem sometimes must be taken up to the chief for arbitration. Sometimes, insults are reported to the police.

#### Local hierarchy / leadership

After that Mr Mphakati left, there's no real leadership anymore. Just some farmers represent others in the committees of each groups.

### **5.5 NATURAL CAPITAL**

#### Erosion

Erosion occurs on river banks. Plus, the drainage from the road can be a problem when it rains heavily.

#### Water quality

Farmers find it suitable for irrigation.

#### Water quantity / availability

There's usually enough water in the river. The problem refers more to silting. There's sand into the river and farmers find it difficult to position the pump inlet.

#### Forest and bush resources

Natural vegetables are sometimes harvested and eaten during harsh times.

### **5.6 PHYSICAL CAPITAL**

#### Transport affordability

Contractors are expensive.

#### Transport availability

Farmers rely on contractors for transporting harvests, and input supply. Farmers rely on contractor for ploughing. Sometimes they do not come and planting is delayed. They said that lack of own transport facilities prevents them to access other markets. No Farmer has a bakkie.

#### 273. Shelter and buildings

They are not in the scheme. There are some very simple selling shacks/stands along the roadsides, for selling purposes.

Storage facilities

They are not available in the scheme. Inputs are stored after delivery at one members' place (group B) or stored in a shack on the other side of the road.

Accessibility / remoteness

The scheme is very accessible and visible from the main road.

276. Road quality

Roads are in good condition.

## 5.7 FINANCIAL CAPITAL

Available stocks (savings, livestock, big equipment)

Not many farmers have animals. For most, the trust savings account is the only way to keep some capital.

Inflows of money, cash availability

For both groups, it depends a lot on the account. Most production is sold, hence income depends on harvests then sales.

Financial organisation (type, interest rate, collateral)

In each group, a trust holds a collective saving account.

Sources of non-farm income (pension, remittances, in kind, salaries)

For most farmers, pensions, childhood grants, remittances from migrant relatives, complement farming income. However, some depend only on the scheme.

## 5.8 LIVELIHOOD STRATEGIES

Contribution of farming to livelihoods

For most farmers, pensions, childhood grants, remittances from migrant relatives, complement farming income. However, some depend only on the scheme.

Coping strategies (in times of crisis)

Sell own labour force to others, eat local natural vegetables from the wild.

In times of drought, group B did not gain enough income from harvests. They had to contract a loan from Uvimbu Bank (R30 000) that they are still repaying now from the bank account.

Farmers from group A said that when money from farming is scarce in the account, they just sell what they have to survive until the next harvest. They do not want to take bank loans, interest rates are considered too high.

Competing / complementary strategies

Farming is not optional, people need it to survive. But at the same time, they cannot just make a living out of it. "Plots are too small, and farmers are too many".

## 5.9 LIVELIHOOD OUTCOMES

Listing (more income, increased well-being, reduce vulnerability / risks, improved food security, better use of natural resources, social status / recognition, etc.)

Farming is not optional, people need it to survive. But at the same time, they cannot just make a living out of it. Plots are too small, and farmers are too many.

So, farming expected outcome is mostly improved income. Even food security is not really an outcome as most produces are sold away. Also, acquiring a status / reputation / recognition through farming does apply only to some few leaders. Also, farmers probably like farming.

### Achievements

The major change has been irrigation infrastructures. But also, under the guidance of Mr Mphakati, farmers are now participating more. Farmers say that Mphakati is gone but the movement is still going on. It's just that some farmers do not want to keep up with inputs. Marketing skills have improved also. Farmers have good contacts with hawkers. Farmers keep saving money collectively into a common account, and re-invest into inputs.

Also, some youngsters are now involved, they have their own plots to farm. The Government is also more involved than it used to be in the past.

### Evolution / changes

Farmers reckon that if there's no intervention in the short / medium term (by the government), there will be no more investment in fertilisers. The trend is to decrease such intensification, yields are not what they used to be. Not enough profit is re-invested into farming, mechanisation is costly, there's no equipment in the scheme.

Somehow, the "Massive Food Production" programme on maize prevents farmers from doing anything else than maize in summer, especially on dryland.

It is expected that youngsters take over. They are already participating during holiday times.

Some transport and mechanization facilities would really help.

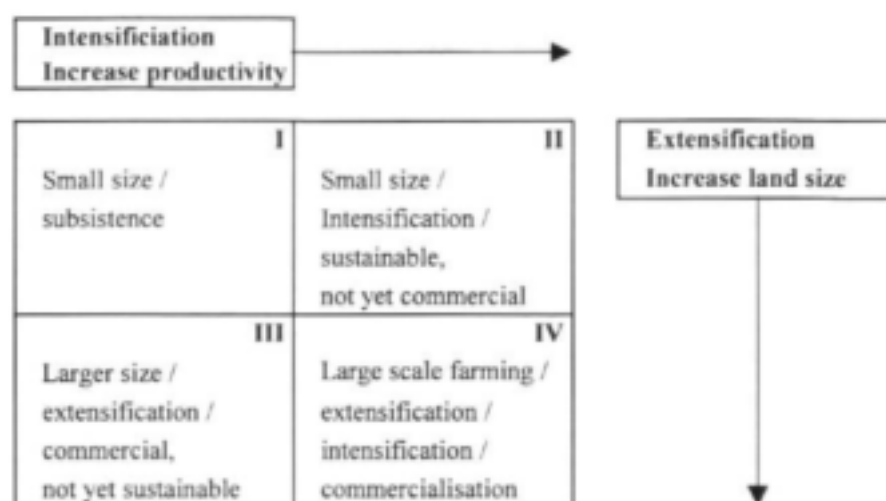
# **APPENDIX E**

## **USE OF THE DYNAMIC FRAMEWORK**

## APPENDIX E: USE OF THE DYNAMIC ANALYTICAL FRAMEWORK

## E1 INTRODUCTION

## THE ANALYTICAL FRAMEWORK



The framework which was developed and described in Chapter 11 to provide a basis for understanding the dynamics of the development of SISs is reproduced above for the reader's convenience, and the reader is referred to the journey taken Chapter 11 through this framework to witness the interaction of its various elements as we move within it.

In this Appendix, this framework will be used to develop concrete recommendations surrounding the problems of growth and development of SISs. These recommendations will relate to problems of growth within existing SISs, as well to problems associated with the establishment of new SISs from scratch.

## E2 EXISTING SCHEMES

## E2.1 General

At the commencement of most existing schemes, most farmers have found themselves in Quadrant I (QI), on small plots, farming at a subsistence level. The ultimate objective should always be to move people from QI to Quadrant IV (QIV) to large-scale commercial farming. However, there will always be people who will stay in QI and have no aspirations to move. These need to be accommodated and will require special assistance.

The move from QI to QIV should not be attempted in a single step. This should be a progressive move, either from QI to Quadrant II (QII) to QIV, or from QI to Quadrant III (QIII) to QIV. There are two possible initial routes to follow, QI to QIII by acquiring more land, or QI to QII by becoming more efficient.

Recommendations relating to each of these progressions are dealt with in detail below. In all cases recommendations will deal with impacts on land tenure, as well as impacts on each of the support systems dealt with in Chapters 4 through to 8.

## E2.1.1 Recommendations: QI – QII – QIV

### E2.1.1.1 QI to QII (*Intensification*)

As explained in Chapter 9, movement from QI to QII involves intensification, or improving efficiency. Achieving this increase in efficiency generally impacts on all support systems, and these impacts are considered in detail below.

#### (a) Finance

The impact of land tenure on SISs operating in QI with aspirations to move to QII are indirect insofar as tenure systems affect tenure options which in turn affect security of tenure and hence access to capital. Capital will clearly need to be invested in schemes in order to upgrade efficiency, but this will probably not be about long-term capital, but rather short-term operational capital.

Without land tenure systems in place which meet the requirements of commercial finance-givers, it is foreseen that finance will still need to be provided by dedicated development finance providers supported by Government.

It is therefore recommended that:

- *Finance should be structured to suit needs;*
- *Appropriate and effective financial advice services be established;*
- *No-one be allowed access to finance without a finance plan; and*
- *Finance plans be financed by system*

#### (b) Irrigation

Land tenure impacts on irrigation where there are communal irrigation schemes, especially where large scale irrigation systems are in place.

Irrigation underpins all production, and it is therefore vital both that water be available when it is needed, and that irrigation systems are operating effectively. In QI and QII maintenance is seen to be the overriding issue.

It is therefore recommended that:

- *Government must play a major role: water must always be available when needed; and*
- *Full use be made of institutions and organisations such as the WUAs, etc.*

#### (c) Production

In these Quadrants, land tenure is not an issue with regard to viability of SISs. Critical issues are production volumes (generally too low) and inputs (generally not appropriate or sufficient).

It is therefore recommended that:

- *Technical advice continue to be provided; and*

- ***Appropriate and effective technical advice services be provided by Government.***

(d) Marketing

Marketing is not an issue at the subsistence level represented by these quadrants.

(e) Management

Management is similarly not an issue at this level.

(f) Social

Socio-economic issues include poverty (pension, social services) and gender, whilst socio-psychological issues encompass the problems of operating under a communal system. Land tenure clearly has an impact in this area, as land tenure systems need to accommodate the requirements of communal living, which may be at odds with the requirements of viable SISs.

Social issues are important because some people will stay in QI; in their case it is simply a question of survival.

It is therefore recommended that:

- ***Government must provide support service to attend to these problems; and***
- ***Government must involve itself with communal system to make it more conducive to effective and efficient production.***

(g) Institutional

Institutions and organisations are important because of social and communal issues involved at this level, as well as because of land tenure requirements.

It is recommended that:

- ***WUAs must exist and be working effectively; and***
- ***Right to housing (accommodation) must be separate from right to use irrigation land. This is particularly important as some people may always stay in QI as mentioned under social issues.***

#### **E2.1.1.2 QII to QIV (Extensification)**

The move between these two Quadrants involves extensification, or increasing the farming plot size. As in the previous section, the impacts of the various support systems are here considered, and appropriate recommendations made.

(a) Land Tenure

Extensification requires expanding land holdings which clearly has land tenure implications. The crucial issue is whether land tenure systems should be changed to accommodate expansion, or whether support systems should be changed to accommodate existing land tenure systems.

It is believed that communal tenure systems need not be abandoned, but that they should conform with the need to expand land holdings. The new Communal Land Rights Act is enabling in nature, and it has already envisaged this need.

*It is recommended that this issue should be diligently followed through.*

(b) Finance

Irrespective of whether land tenure changes are implemented, the risk element is still a problem for access to commercial finance by small farmers. Finance is required for operational costs as well as for capital for land acquisition.

*It is therefore recommended that Government will have to play a major part in supporting dedicated development financing arrangements.*

(c) Irrigation

As already stated (QI – QII) irrigation is of cardinal importance in SISs.

*It is therefore recommended that technical assistance should be available to individual farmers where crops may need more efficient irrigation systems.*

(d) Marketing

As we are now considering movement into an area where commercialisation is the goal, effective marketing now becomes an issue. It is therefore recommended that an advisory unit assisting with development of marketing avenues to be put in place by Government.

(e) Production

Selection of crops now becomes an issue, and it is important that the most appropriate crops be selected. Technical advice will be required, and it is recommended that this service be made available.

(f) Social

Physical infrastructure now becomes an issue, with a need for reliable and affordable electricity and an effective roads infrastructure for transporting inputs and outputs.

*It is recommended that attention be given to upgrading the infrastructures accordingly.*

## **E2.2 Recommendations: QI – QIII – QIV**

### **E2.2.1.1 Qi to QIII (Extensification)**

Moving to QIII from QI can be done, but this is not recommended. There are problems with land tenure, and as will be seen in the next section, QIII is a risky Quadrant.

#### **a) (a) Land Tenure**

As will be discussed later, it is necessary that all farms in QIII must be commercially viable (greater than the critical size) as they are subdivided. Moving to QIII from QII would thus mean providing all subsistence farmers with plots of a commercially viable size. This would effectively mean taking all farmers off the land and selectively reinstating some of them on larger plots.

We are here dealing only with SISs, but currently some commercial white farms are being redistributed in this way (with very questionable results).

*It is recommended that on existing SISs the development path should not be through QIII, but rather through QII.*

#### **E2.2.1.2 QIII to QIV (Intensification)**

The issues involved here are the same as for new farmers, and will be dealt with in the next section.

### **E2.3 New Schemes**

#### **E2.3.1 General**

Following on the above discussion, it is believed that when new SISs are established, entry should be into QIII, **not** QI. This means that farm sizes are such that they can be commercially viable from the start. Land tenure options must be for private ownership from the start. Selection of new farmers is a critical component for success in starting new SISs. Peoples farming ability and aspirations must be taken into account when selecting suitable incumbents.

#### **E2.3.2 Recommendations**

##### **E2.3.2.1 QIII to QIV (Intensification)**

QIII is a very risky quadrant. The farms are of commercial size, but farmers usually not capacitated. Failure can be both sudden and dramatic.

##### (b) Finance

Schemes should all embody private ownership, so other tenure considerations are not of relevance.

*Considerations and recommendations are otherwise the same as for QII – QIV.*

##### (c) Irrigation

As before, water is an essential input to production, and again maintenance is an issue. In addition, irrigation systems should be implemented according to the most appropriate technology.

It is therefore recommended that:

- *Government must still play a major role with regard to the selection of the most appropriate technology; and*
- *Water users must pay for water, which should be metered from the start.*

##### (d) Production and Marketing

*Considerations and recommendations are otherwise the same as for QII – QIV.*

##### (e) Social

*Considerations and recommendations are otherwise the same as for QII – QIV.*

# **APPENDIX F**

**HOUSEHOLD SURVEY QUESTIONNAIRE**

**Do not forget that Mgazi scheme operated pretty much on a collective basis.  
Group interviews and discussions may help a lot.**

**1. HOUSEHOLD SURVEY QUESTIONNAIRE**

Date: .....

Province: .....

District: .....

Location: .....

Respondent's name: .....

Gender:         Male / Female

Name of head of household: .....

## 1: Household Composition

Name	Age	Gender	Educational level	Main occupation
1. Head				
2. Spouse				
3. Children > 16				
4. Children <16				
5. Children <5				
6. Others				

1- Male  
2-Female

1. No edu.  
2.Gr1-6  
3.Gr1-6  
4.Gr1-6  
5. Certificate

1. Retired  
2. Unemployed  
3. Full time farmer  
4. Regular employed  
5. Self employed

## 2. Land tenure

Type of plot	Size	Unit	Tenure system	Any title deed or proof of tenure ?
1. Dry land 2. Irrigated land 3. Kitchen garden 4. Community garden		1. Ha 2. Morgen 3. Acres 4. Square meters	1. PTO 2. Shareholding 3. Freeholding 4. Quitrent 5. Leasing agreement 6. Other (lending)	Yes / No

When has your family settled in the scheme?

.....

Farm size ( total area of your plots in the scheme)

.....

Do you pay any fees for land?  Yes  No

If yes, how much per ha?

.....

Do you pay any fees for water?  Yes  No, if yes how much per ha?

.....

### 3. Cropping System:

Crop name	Area Planted 1. Ha 2. Morgen 3. Acres 4. Square meters	Qty Harvested (specify unit: tons, kg, bags, boxes, cobs, bowls, bundles...)	Qty Sold (Specify unit)	Price/unit	Qty consumed (specify unit)	Market outlet 1. local 2. shop 3. Neighbours 4. Hawker 5. Contractor 6. Other (specify)

# The average of quantity harvested for the last two years

# Market price per unit will be checked with an extension officer





## 6. Livestock Description

Livestock type	Number currently owned	Number sold from sales	Gross income
Cattle			
Goats			
Sheep			
Pigs			
Chickens			
Horses			
Donkeys			
Mules			

Number and type of animal slaughtered for family purpose last year?

.....

Where are they grazing? On the scheme?  Yes  No

Any problem with livestock ? .....

**7. Finances**

Do you hire people for farming?  Yes  No

If yes, how much did you pay per year per ha?.

.....

Have you got other sources of income in the household? ( e.g. pension, remittances, wages, salaries, grant), from who?

.....

**Are you using credit facility?**  Yes  No

If yes , what was the source of the loan?

supplier

relative or friend

money lender

stockvel

output buyer

financial institution: .....

other

**What was it for?**

Farming

general maintenance / household purchases

For food

Have you got any debts outstanding?  Yes  No

## 8. Scheme Management

Name of the Crop/ field	Irrigation type	Problems and shortage

In the frame of an improved water supply and water related services, how much would you be ready to pay/ ha /year for such supply and services?

- nothing
- a given amount per year per ha (specify in Rands if possible.....)
- An amount depending on your farm income( specify in % for instance.....)

In your opinion, who should pay for water services ?

- anyone should pay for water services?
- the ones that are making money?
- the ones that are irrigating a lot?
- none

**9. Water User's Association:**

Is there any farmer association in the scheme?  Yes  No,      If yes, are you part of it?

What is it for?

If no, would you be interested to form it?

Do you know of any initiative regarding a Water User Association being formed ?

Any opinion on that ?

**10. Concluding the interview**

What are your major problems

as a beneficiary of the scheme ?.....

as a member of the community ?.....

How do you see the future and what are your prospects

As a beneficiary of the scheme ?

As a member of the community ?

Final general comments the farmer would like to make:

## Other related WRC reports available:

**Smallholder irrigation and agricultural development in the Olifants river basin of Limpopo Province: Management transfer, productivity, profitability and food security issues.**

*Machethe CL; Mollel NM; Ayisi K; Mashatola MB; Anim FDK; Vanasche F*

Most "upliftment" irrigation schemes in South Africa are not viable. A few schemes that are in operation are under-performing. The main reason is that beneficiaries have never been involved in the management of the schemes. It is only recently that the government and other stakeholders realised a need to hand management over to the beneficiaries. In this way, the end-users will be responsible and accountable. However, other technical and social problems need to be identified and addressed. Once this happens, the potential of the smallholder irrigation schemes in this country will be unlocked. This project identifies economic, social, institutional and policy issues affecting smallholder irrigation. It will also determine the extent to which poverty alleviation and empowerment of smallholder farmers can be achieved through self-management of smallholder irrigation schemes.

**Report Number: 1050/1/04**

**ISBN No: 1 77005 242 9**

**TO ORDER: Contact Publications** - Telephone No. 012 330 0340  
Fax Number: 012 331 2565  
E-mail: [publications@wrc.org.za](mailto:publications@wrc.org.za)



**Water Research Commission**

Private Bag X03, Gezina, 0031, South Africa

Tel: +27 12 330 0340, Fax: +27 12 331 2565

Web: <http://www.wrc.org.za>