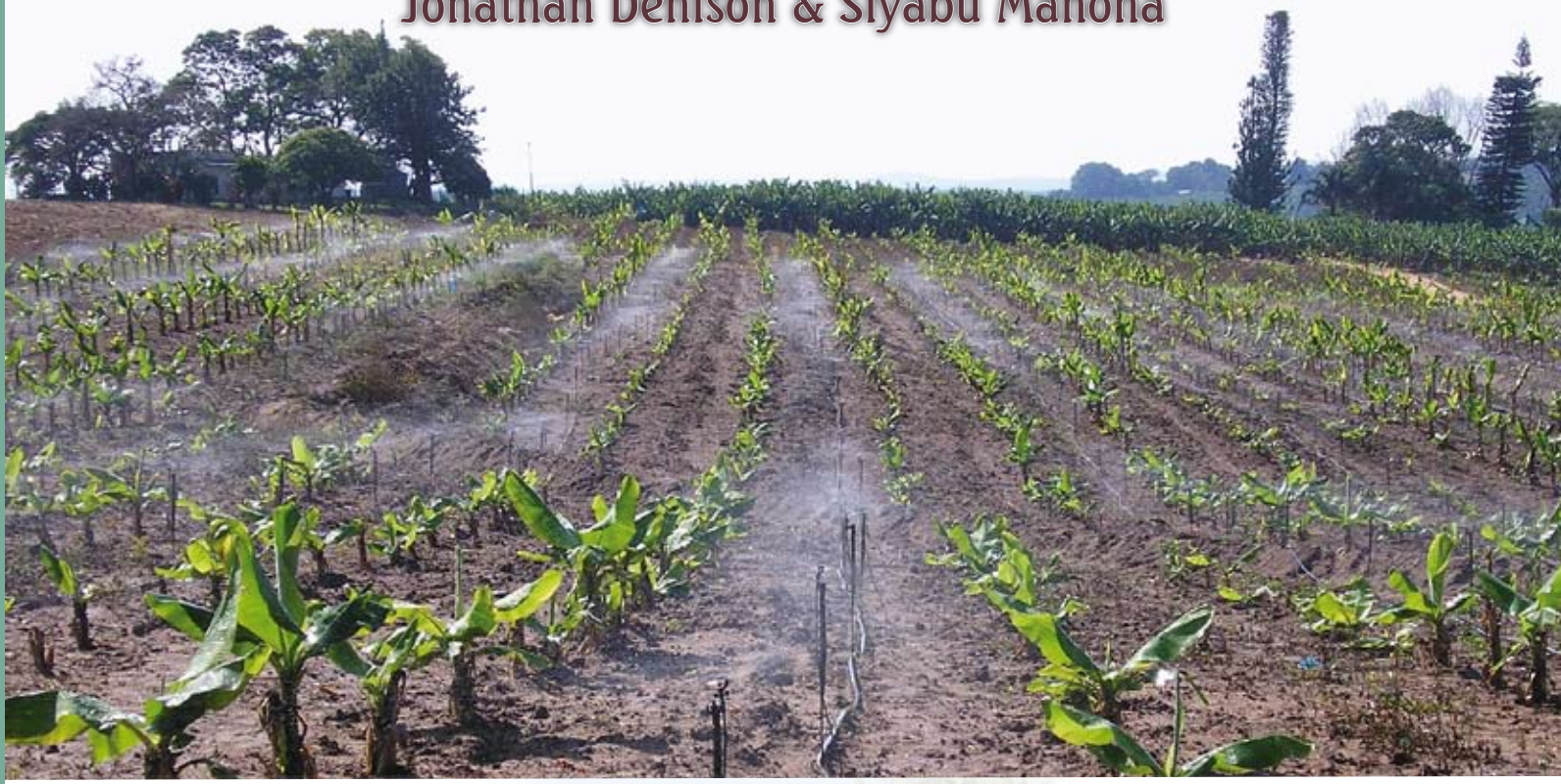
Principles, Approaches and Guidelines for the Participatory Revitalisation of Smallholder Irrigation Schemes

Volume 1 – A Rough Guide for Irrigation Development Practitioners

Jonathan Denison & Siyabu Manona



TT 308/07

Water Research Commission

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Volume 1 of 2

A ROUGH GUIDE FOR IRRIGATION DEVELOPMENT PRACTITIONERS

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and Siyabu Manona

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abstract

In 2003 the Water Research Commission funded a three-year project to develop guidelines for the revitalisation of smallholder irrigation schemes in South Africa. A national database of 317 schemes covering approximately 50,000 ha was compiled. These are located mainly in the former homelands. While most of these schemes have collapsed or are under-utilised they continue to draw substantial funding from the Government for social and economic upliftment, often with limited success. The guidelines document best South African and international practice and are intended for Government decision-makers, technical and extension staff, consultants, development practitioners and scheme leadership.

The 'Rough Guide' (Volume 1) is a quick reference guide that covers policy implications and revitalisation objectives, as well as recommended principles, approaches and methodologies for scheme diagnosis, participative planning, feasibility evaluation and formulation of farmer support programmes.

'Concepts and Cases' (Volume 2) contains the theoretical rationale for the guidelines. Four major South African revitalisation initiatives are compared with international initiatives and success factors are identified. Eight farmer support approaches are documented, providing lessons of best practice as well as alternatives for programme design, and new approaches are presented. These are a tailored consultative planning approach, a land-leasing strategy for irrigation schemes and the formulation of four basic farming styles to guide planning.

The guidelines present alternative pathways to constructive change on schemes, with full appreciation of the complexity and diversity on and between the schemes. They are based on meaningful involvement and information exchange between farmers, plotholders and technical experts and thus ensure co-constructed plans for land-tenure, agricultural, technical, institutional, marketing and financial aspects. Best practice shows that major investment in human capital development is critical and that land-market stimulation can, in many cases, unlock potential. Interventions need to address all aspects of irrigation scheme operation and farm system planning, and avoid single-sector interventions such as infrastructure upgrading, mechanisation or institutional development alone. The Guidelines present ways forward to achieve greater success.

acknowledgements

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Dr	GR	Backeberg (Chair)	Water Research Commission
Mr	JJ	Janse van Rensburg	Department of Agriculture (Free State Province)
Mr	JF	Joubert	Department of Agriculture (Eastern Cape Province)
Prof	SR	Perret	University of Pretoria
Dr	H	Sally	International Water Management Institute
Dr	M	Shaker	Agricultural Research Council
Dr	DP	Troskie	Department of Agriculture (Western Cape Province)
Mr	AT	van Coller	National Department of Agriculture
Mr	FPJ	van der Merwe	Department of Water Affairs and Forestry
Mr	BJ	van Wyk	National Department of Agriculture

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foreword

The situation of under-producing and collapsed smallholder irrigation schemes nationally is both a prominent political concern and a major budget item on many Departmental and District Municipality financial plans. There is a widespread perception that these schemes have potential for substantial "economic growth, employment and poverty alleviation". Many of the 317 or so irrigation projects in the former homelands continue to attract hundreds of millions of government investment annually in the hope of visible returns. In most instances these programmes have failed to achieve the target outcomes linked to economic growth of 6%, increased employment and to benefit from the significant multiplier effect linked to agriculture. The high incidence of failure demands a revised strategic approach from those of the past (both post 1994 and before).

The reasons for failure are diverse; debate on appropriate solutions to the irrigation challenges that have dogged the last three decade continues unabated often with inappropriate simplifications and generalisations. While resource potential on schemes and market analysis provide a theoretical basis for optimism, hard experience of programmes across the country since 1994 shows clearly that unlocking potential through revitalisation initiatives is far more difficult, time consuming and costly than many professionals and politicians have realised.

The review of approaches within and outside of South Africa (presented in Volume 2 of the document) emphasises the critical need and justification for a major portion of investment in the institutional and people-skills elements. These have historically been tacked onto major infrastructure-centred initiatives as a small and often generically formulated attempt at 'capacity building' using vaguely defined 'participatory methods'. While capacity and skills development is one of the primary areas for engagement in revitalisation, it has rarely been afforded the appropriate funding by decision-makers. It is also a complex and uncertain arena in which to be investing major funding compared with the relatively concise and low-risk engineering and agricultural hardware components.

The guidelines have set out to achieve what many argue cannot be done and some suggest is a fundamentally flawed concept – ie. smallholder irrigation revitalisation in the South African financing, procurement and political context. It is also argued that relevance exceeds the emphasis and major funding that is allocated as smallholder irrigation schemes directly impact only some 31,300 families who have access to plots. There is thus limited ability to impact on the estimated 17 million rural people in a state of poverty even when the multiplier effects to the downstream economy are considered. It is a rich irony that given the substantial theoretical potential, the political will to address poverty and stimulate economic growth in the agricultural sector and the available financial resources to do so - the experience is one of minimal success. This irony is perhaps the crux of the motivation for continued emphasis on irrigation revitalisation from the highest political levels.

In contrast to the above debate, there is general agreement that addressing rural poverty and food security through agrarian reform will need to extend well beyond even the broadest of irrigation revitalisation initiatives to have meaningful impact on the plight of the rural poor. The guidelines have attempted to identify opportunities for linked initiatives and present rationale and options to create synergies between on-scheme and off-scheme interventions.

The guidelines have been developed in cognisance of three realities:

- There is clear and committed political intent to finance major irrigation revitalisation initiatives and expansion at national, provincial and municipal levels to achieve political goals of economic growth and poverty alleviation. The location of most schemes in densely populated rural areas, which are zones of poverty and high unemployment increase this attraction. Thus funding of irrigation revitalisation is likely to continue and increase and the guidelines attempt to steer these new and ongoing initiatives to engage more realistically and constructively.

- There is a growing awareness and acceptance, based on national experience of revitalisation attempts over the last 10 years (as well as previous decades), that solutions remain complex, expensive, high risk and difficult to achieve. Importantly, amongst decision-makers and technocrats there seems to be a willingness to engage with past lessons leading to constructive options. The guidelines present ways forward.

- The plotholders who have access to irrigated land on schemes needs and experiences are generally far removed from the conceptual field of engagement with terms like poverty alleviation and economic growth over the life of a project. People need immediate benefits, food, jobs and income streams to complement existing livelihood strategies of which irrigated agriculture is usually a small part. The guidelines present clear ways of linking the traditionally narrow definition of on-scheme irrigation to broader agricultural water use and related livelihoods activities.

The central strategic theme that emerges in the guidelines is the critical need to appreciate and address the full complexity of the collective irrigation enterprise. This includes human and social capital, technical, land tenure, production and finance systems, input and output markets, institutions, catchment management among others. Plotholders need to be at the centre of the planning and implementation process which demands substantial two-way information transfer so that the implications of their decisions can be fully appreciated.

*"Integration will be key in this new approach**: integration across scales, components, stakeholders and disciplines**" (Sayer and Campbell in Merrey et al., 2003).*

*"Smallholder irrigation is a highly case-specific, potentially complex, dynamic **socio-biophysical entity** influenced by a considerable number of internal characteristics and external driving forces and factors, and is a driver of considerable change on downstream sectors and users. Have we recognised this special nature of irrigation within livelihoods, food and cash production, river basins and the environment?" (Lankford, 2001).*

*"Focussing more emphasis on the improvement of physical infrastructure is not sufficient. There is a need for a more comprehensive approach, encompassing the development of both **physical capital and social capital** that provide complex systems … to use irrigation water."(Neeraj et al., 1998).*

The guidelines present ideas on strategy as well as project level detail. It is hoped that the reported program experiences, case studies and suggestions on possible approaches will equip planners and implementing agents to engage more creatively and responsibly for the immediate and long-term benefit of those who live on and adjacent to the schemes.

Jonathan Denison Siyabu Manona

December 2006

executive summary

The Guidelines for the revitalisation of smallholder irrigation schemes were developed under a three year Water Research Commission Project based on South African and wider regional experiences. There are more than 317 irrigation schemes covering approximately 50,000 ha in the former homelands of South Africa and these are either collapsed or utilised well below their potential. The Irrigation Revitalisation Guidelines have been developed to help planners and implementing agents to address this situation.

There are two volumes to the Guidelines:

- **The Rough Guide (Volume 1)** is a quick reference guide for the more action-oriented and is written to allow easy access to the main principles, approaches and methodologies to support and guide implementing teams.

- **Concepts and Cases (Volume 2)** contains the theoretical rationale for the guidelines based on a set of arguments developed through field research and case investigation. This includes study of South African and international revitalisation approaches and commercial partnerships.

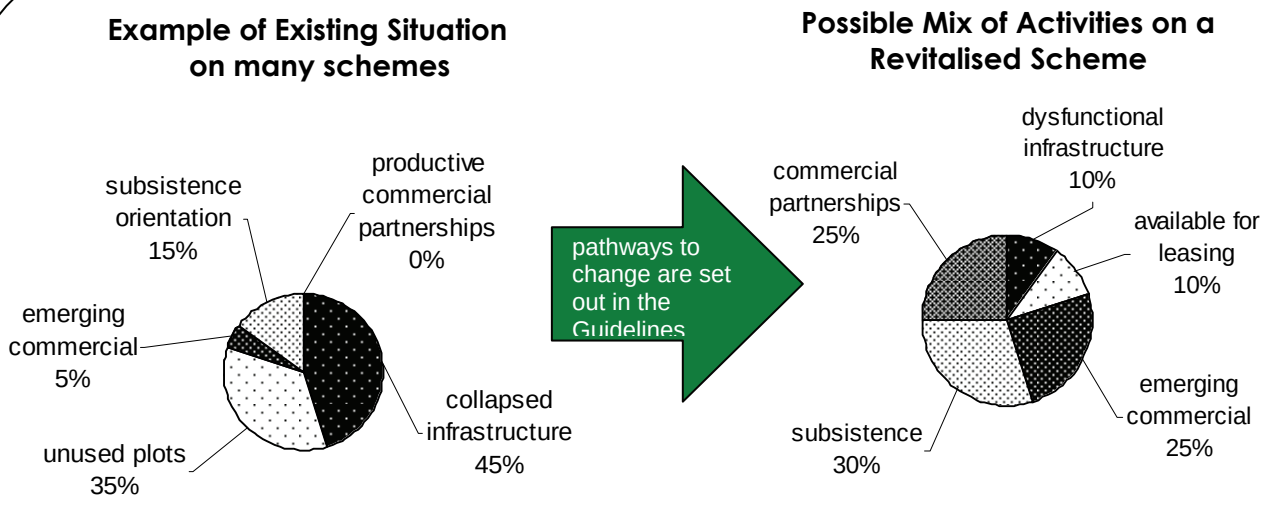
readers of the Rough Guide

The guidebook audience is expected to include people from diverse educational levels, varying skills and interest in revitalisation. These include:

- **Departmental officials** (Agriculture, Land Affairs, Department of Water Affairs and Forestry, etc.)
- **District Municipal officials** and politicians tasked with strategic input to setting of objectives, steering development approaches and influencing funding decisions.
- **Irrigation scheme leadership** and participant plotholders and farmers who are engaging with external agencies and government in revitalisation initiatives that are taking place on their land and in their communities.
- **Consultants** – often civil-engineering consultants who often find themselves leading multi-disciplinary professional teams engaging in revitalisation because of the large percentage of costs related to the engineering components.

purpose of the guidelines

The guidelines aim to present alternative pathways to constructive change on schemes with full appreciation of complexity and diversity – both on schemes and within any particular scheme.



Schematic: Pathways from existing situation to improved situation
Note that percentages are illustrative only

principles of engagement

The principles of how we engage with people and how we think set the stage for more successful outcomes. Respect, profitability, participation, community control and an acceptance of widely diverse needs on schemes and between schemes are key to achieving success.

conflicting irrigation revitalisation objectives

Objectives are potentially contradictory and can undermine initiatives if not clarified early. Objectives must be interrogated so that the full meaning of catch phrases (e.g. poverty alleviation and food security) are agreed by all involved in the planning and implementation process.

policy

The national and provincial policy environment is clearly an important starting point in revitalisation. National policy requires that irrigation schemes are planned to deliver positive economic returns (in keeping with national economic targets) and cover their own operational costs (supported by 'sunrise' funding packages and phased-out subsidies).

Provincial policies, where they exist, are characterised by an emphasis on capital expenditure and infrastructure development (ie. irrigation hardware and technology) and a heavy reliance on the concept of commercial partnerships for the production component. Given South African and international experiences in smallholder irrigation (documented in this study), provincial policies need to be reviewed to accommodate more diverse solutions in acknowledgement of the widely differing technical, social and historical situations of schemes. The adoption of generic strategies applied to widely different schemes is unlikely to meet the diverse opportunities, plotholders needs and operational realities of schemes in any one province.

revitalisation process

Participative Planning

1 to 3 months whole-enterprise planning

The timelines for the consultation and planning of the revitalisation process might be 1 to 3 months depending on scheme size. This will take the process to the point where the strategies are agreed, defined and implementation costs are established in a feasibility study. Planning processes to be considered include the SMILE methodology and the ICON approach detailed in Volume 1 and Volume 2.

Long implementation timelines

Think 5 to 8 years of support

Planning must embrace whole-enterprise thinking including land, water, infrastructure, crop production, management, institutional support, conflict resolution and mentoring. Timelines for construction are short but budgeted involvement must extend for much longer periods, beyond 3 years as an absolute minimum, preferably 5 to 8 years. As time progresses the role of the implementing agents will shift from being central to meetings and processes to that of an external advisor mainly dealing with conflict resolution, institutional support and advice.

Neutral 'agent' central to process

Institution building and conflict resolution

The case studies all show that there is an important role for a 'neutral' party to address institutional building, contract brokering and conflict resolution between scheme participants and the contract parties. This could be an NGO, an experienced rural development consultant group or an academic institution with a rural development interest.

feasibility planning

There are a number of approaches and tools that are useful in carrying out participative and meaningful irrigation feasibility studies in addition to conventionally applied practice. The feasibility planning process comprises in its shortest form:

a) a resource evaluation,
b) consultative planning of a range of agricultural enterprises and support interventions
c) a cost-benefit analysis of options leading to substantiated pathways to change.

Selected useful tools are outlined which address consultative planning and cost-benefit analysis. These are:

- SMILE (Sustainable Management of Irrigation Lands and the Environment)
- The Small Scale Irrigation Planning and Design Manual (WRC publication)
- The Iterative Consultative Planning Approach (ICON)

These tools are useful to augment conventional agricultural economics good practice. This is mainly because of their focus on consultation, participation and knowledge sharing between sectoral specialists ('experts') and scheme participants who have specialist local knowledge critical for practical planning and successful implementation.

consider these possibilities in your mix of interventions …

Institutional separation: A case is made for separating the water-related institutional functions (rules of scheme operation) from the agricultural organisational and support elements which are more varied, dynamic and opportunistic. Excessive institutionalisation of the agricultural production elements (e.g. input sourcing and marketing) can throttle individual enterprise and profitability.

Multiple use of water as a concept extends development impact and creates synergies to the benefit of the scheme users and the broader community, including water harvesting for food production and the link to promoting a land-leasing market.

Conservation agriculture is one of the innovations that can be introduced (mainly to 'smallholders' and 'business farmers') to lower their risks and reduce their cash flow requirements by cutting down on input costs. Conservation agriculture is implicit in the food producer approach of deep-trench beds and diversified, intensive production.

Plot sizes and land-leasing markets: Experience shows that many people who have irrigation plots don't want to engage in irrigated farming on the scheme because of limited resources, skills, interest and the high risks of farming. However, they are often reluctant to lose their access to the irrigated plot given their vulnerability and poverty and the potential the land holds for production perhaps at a later stage.

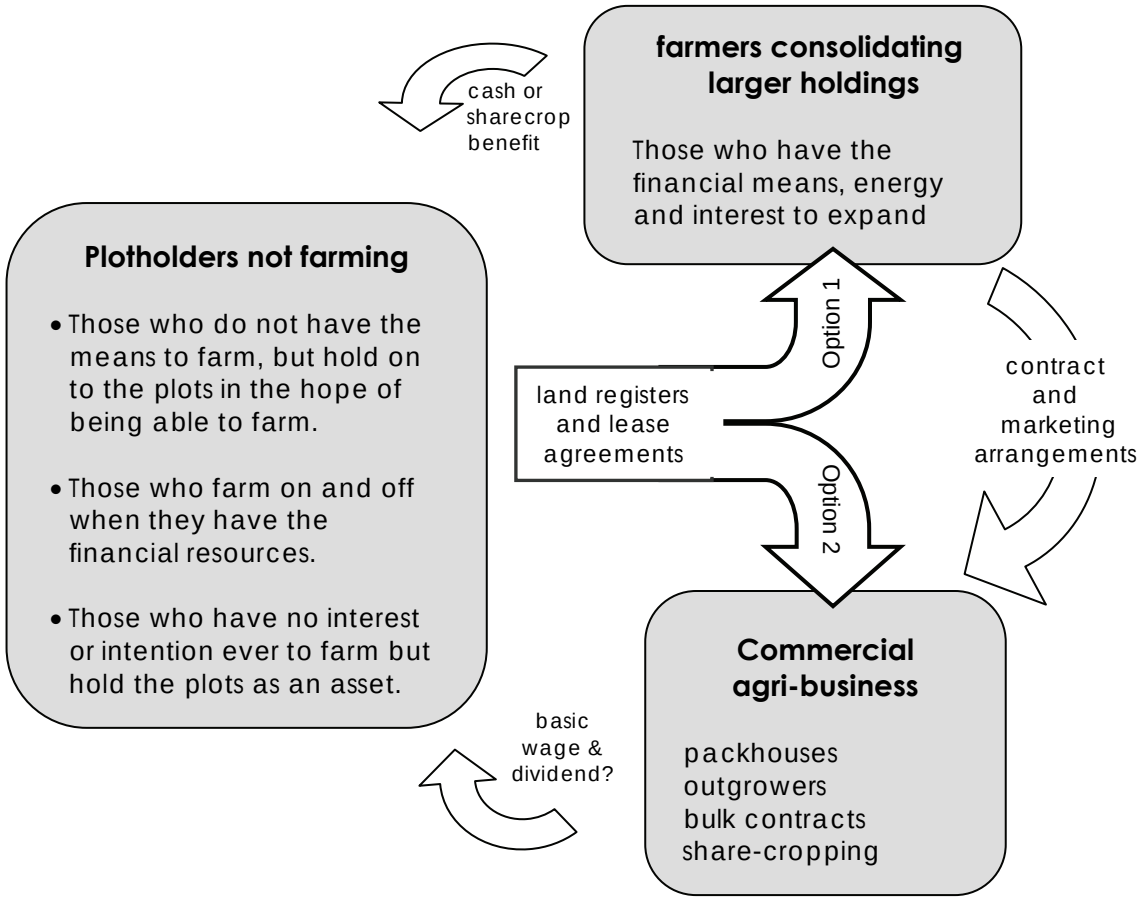
Intensive diversified home food production (in the village homestead) underpinned by rainwater harvesting, tank construction and grey-water re-use present a valuable opportunity for breaking out of the limiting cycles posed by small plot sizes on many schemes. This stimulates more viable irrigated farming on larger plots on the schemes and successfully targets primary poverty realities of hunger and malnutrition through food production within the homestead.

land exchange strategy

Most of the high-value irrigation land on the smallholder irrigation schemes in the former homelands is not being utilised. Those who currently have access to the land tend to avoid leasing their plots. This is one of the main reasons for low productivity on schemes (Perret, 2002). The reasons for low utilisation include:

- The high risk nature of farming in an unregulated market environment, with minimal farming systems support and with low water reliability given poorly functioning technical and institutional systems.
- Low profitability and difficulty gaining market access.
- Inability to finance input costs in advance.
- Lack of motivation to risk available capital when major portion of income (75%-85%) is from non-agricultural sources, primarily remittances and pensions.
- Those who do not have the means to farm, but hold on to the plots given their vulnerability to poverty, where a plot is an asset of some kind.

Schematic: Transfer of land between those not farming and potential lessors



The land-use choices of those who have rights to irrigated plots but don't use them are not necessarily fixed. It is possible that people may choose to stop farming for a few years and when their situation (finance, labour) changes may engage in farming again (Van Averbeke et al., 2005). The strategy therefore needs to be flexible.

Steps in the land exchange strategy:

Step 1: Introduce the idea and process
Step 2: Demarcate fields and survey with a GPS
Step 3: Facilitate a mediation process where claims conflict
Step 4. Produce maps overlaid on aerial photographs
Step 5: Demarcate hydraulic units (irrigation systems) and production units
Step 6: Identify opportunity and interest in land exchange
Step 7: Agree on lease amounts
Step 8: Formalise the lease contract (Pro-forma agreements are in the Rough Guide)

key success factors

Whole-enterprise planning: Literature and case studies show that single-sector interventions, such as repairing infrastructure only, supplying tractors alone or developing institutional structures alone are highly unlikely to achieve anything positive. Farmers on smallholder schemes need support systems that include every aspect of the irrigated farming venture if they are to improve their livelihoods. South African experience shows clearly that budget allocations for training, management and institutional development need to be 40% to 50% of total irrigation revitalisation budget. Infrastructure centred interventions (installation of irrigation systems without extensive human capital development) are highly likely to fail.

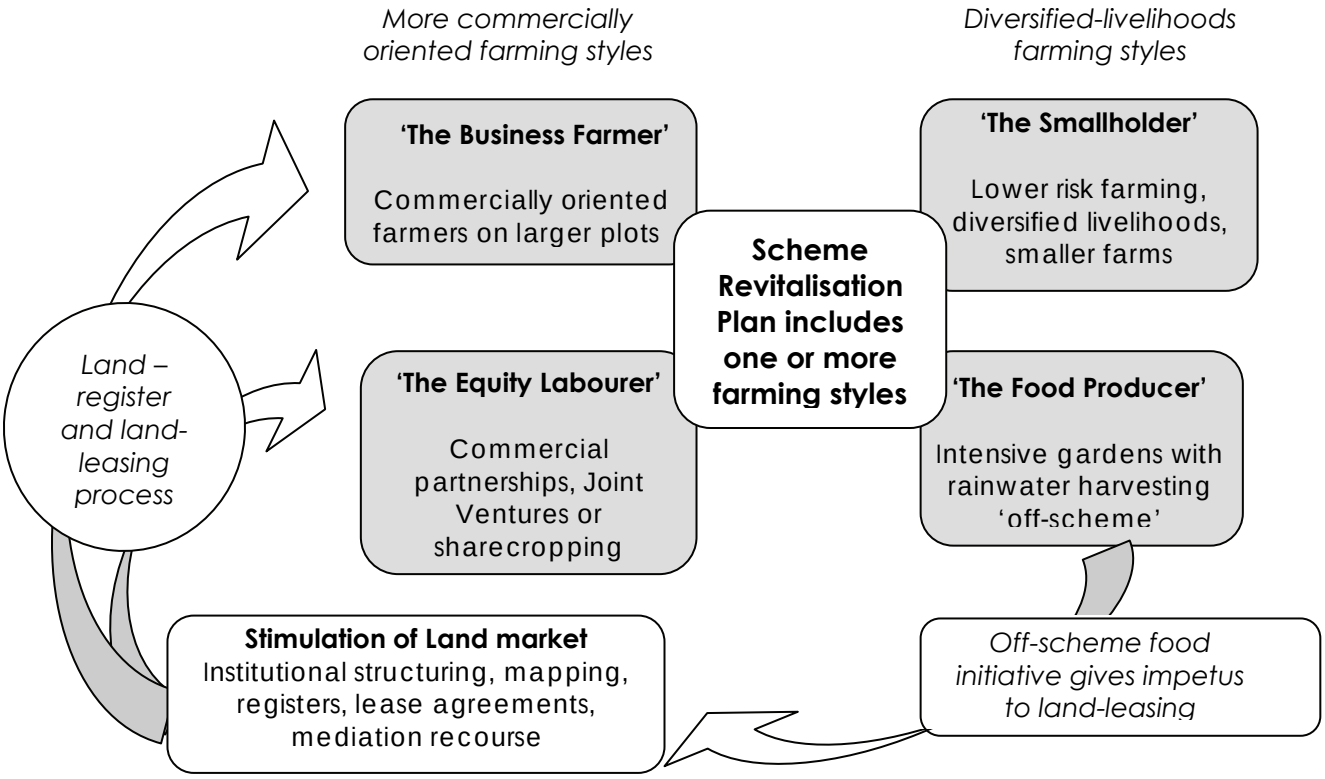
Land size and tenure: Insecure land tenure and the related issue of irrigation holding size need to be addressed. Farmers who work small plots are forced to pursue a number of income and livelihood behaviours of which irrigation may be a small part and therefore with a negative impact on commitment and interest. Full time farming is an incentive to engage in management and operation of the scheme. Insecure tenure limits incentive to make investments and provides no room for a land-leasing market.

Institutional clarity: The necessity for institutional clarity (ie. clear and enforced rules of engagement) in regard to the water management, infrastructure and land tenure is critical to reduce institutional uncertainties. This will allow a shift in farming behavioural change where greater risks are accepted and greater returns can be achieved.

old problem - new conceptual tool

Four generalised farming styles have emerged from observation of irrigation schemes, case discussions and literature review and are key to formulating a strategic plan for revitalisation. These farming styles can exist alone on any one scheme but are more likely to be found in a mix on each scheme, which represent the varied range of plotholders needs and available resources to farm.

Schematic : Farming Styles as a Planning Tool



The farming styles are characterised as follows:

- the '**smallholder'** (lower risk approach, diversified crops, smaller plots, needs lower water costs – typically on flood and smaller schemes)
- the **'business farmer'** (larger plots, more externally oriented with cash focus, farming is main income, needs land leasing efforts)
- the **'food producer'** (intensive food gardens with rainwater and grey-water harvesting off-scheme, stimulates land-leasing, hits poverty)
- the '**equity labourer'** (commercial partnership arrangements, joint ventures and sharecropping, main benefit is basic employment, esp. schemes with high costs)

The general approach motivated in the Rough Guide is to use consultative diagnosis and planning methods (such as SMILE and ICON) to generate mixed scenarios of future land-use and farming styles. Choice and practicality of farming styles are influenced by the existing farmers' willingness and interest, infrastructure limitations, repair and running costs, opportunities for farm production support and marketing. A mix of farming styles can co-exist on any scheme and is likely to change continuously over time in response to changing opportunities, social and market influences.

farmer support strategies

A range of inspiring practical examples of successful farmer support can be used in a mix, be copied or be modified as needed. These relate to the applicable farming styles that will emerge from the scheme planning process. These strategies include:

- **Commercial** partnerships which can be a source of both finance as well as a wide range of production, management and market support. Reliance only on commercial partnerships is unrealistic as experience shows that there is a clear shortage of willing partners given the risks of insecure land tenure, farmer representation as well as crop production risks more generally. While this approach will not apply to all schemes it can play a role on some schemes, particularly those which are operationally expensive and technically complex. Experience shows that benefits to farmers are largely limited to basic employment, mainly due to the large numbers of plotholders and the relatively small return per (small) irrigated plot that they receive.

- A **One-stop Agri-business Support Centre** is an approach based on a successful resource centre case in South Africa, which provides an accessible and dynamic mix of input, production, institutional, finance, information and marketing services. This could be funded by Government or with NGO or private sector input.

- **Privately or NGO managed extension officers**, re-trained for the specific irrigation support task and in turn supported by a central group of sectoral experts has been successful in KZN. The 'extension units' are supported with transport, current information covering production, technical and marketing elements and actively engage with farmers on an ongoing basis. The primary service is live information and support to mobilise development funds. This approach could be tailored for any specific scheme but is only as strong as the management and information centre that underpins it.

- **Mentorship** type farming partnerships with NGOs and professional mentors which provide key support to crop production knowledge streams and conflict resolution to institutions and groups. These mentors are typically successful farmers from the commercial sector engaging full or part-time with emerging farmers. Individual personality and style largely determine success, empowerment and skills transfer.

- **Academic** partnerships, where ad-hoc and targeted research interventions can accumulate momentum and cover increasing scope on a single scheme over time, as well as provide a neutral party to mediate and link to external agents.

- Dynamic, **needs-based farmer training materials** for extension officers are recently published by the WRC, with detailed training materials that are PAETA registered (Botha et al., 2006). Given the range of content at present, these materials are probably best suited to green and dry maize production for 'smallholders' and medium value crop production for 'business' farmers.

conclusion

The whole approach outlined in the Guidelines is driven by the hopes and aspirations of scheme participants and brought to reality by a set of technical and financial boundaries. The development of the strategies for irrigation revitalisation is based on farming styles which can all co-exist on any one scheme.

The needs of each of the farming styles are sufficiently distinct that they must be catered for with different strategic packages. Once the project reaches implementation the actual plan that is formulated on these broad typologies will contain all of the main elements that are necessary to flexibly meet the real and diverse needs of each group. Use of the farming style concept will allow practical early decision-making in the planning process regarding the general mix of farming activity which otherwise gets overwhelmed by diversity or is simplified to death by generalisation.

Running costs play a significant part in the gross margin evaluation and the scheme technology, size and condition is likely to split farmers into 'smallholder' and 'business farmers' fairly clearly, which in turn will lead to optional land and production support strategies. The makeup of these will hopefully be inspired by some of the ideas presented in the Guidelines or perhaps by direct communication with some of the programs which are briefly outlined. Cross visits, brainstorming sessions, outsourcing of components, emulating and modifying while learning through process cannot be defined in the guide. It is this very dynamic and fundamentally supportive process to the range of farmers themselves that is the pivotal role of the person or team driving the revitalisation process.

To simply say revitalisation is possible or that it is impossible denies the spectrum of people, skills, infrastructure, climate, market, history and opportunity that is out there on the hundreds of schemes in the former homelands. Some schemes, because of their inappropriate costly technical designs, their position relative to markets may be unviable. It will take courage to explain the analysis and stick to realism and policy. More optimistically, it is hoped that the Rough Guide will assist in finding those elusive solutions and worthwhile outcomes.

contents

acronyms

ABP	Agri-Business Place
ACAT	Africa Co-operative Action Trust (based in KZN)
ACT	African Conservation Tillage Network
ADM	Amathole District Municipality
AGIS	Agricultural Geographic Information System (of the Department of Agriculture)
AgriBEE	Black Economic Empowerment in the Agricultural Sector
AGRISETA	Agricultural Sector Education Training Authority
AO	Assegai Organics
APPIA	*Amélioration des Performances des Périmètres Irrigués en Afrique (English IPPIA)*
ARC	Agricultural Research Council
ARDC	Agricultural and Rural Development Corporation
BDCA	Biodynamic Certification Agency
CAC	Ciskei Agricultural Corporation
CASP	Comprehensive Agricultural Support Programme (Dept of Agriculture)
CBO	Community Based Organisation
CCAW	Coordinating Committee on Agricultural Water Use (Provincial level)
CCSIS	Coordinating Committee for Small Irrigation Schemes (National level)
CHDM	Chris Hani District Municipality (Eastern Cape)
COMBUD	Computerised Budget Program for Crop Enterprises
CPA	Communal Property Association
DALA	Department of Agriculture and Land Affairs
DBSA	Development Bank of South Africa
DEDT	Department of Economic Development

DFID	Department for International Development
DM	District Municipality
DWAF	Department of Water Affairs and Forestry
E.Cape RPF	Eastern Cape Resource Poor Farmers Irrigation Revitalisation Initiative
ECDA	Eastern Cape Department of Agriculture (formerly DALA)
ECDC	Eastern Cape Development Corporation
EFO	Ezemvelo Farmers Organisation
FAO	Food and Agriculture Organisation of the United Nations
GEAR	Growth Employment and Redistribution
GIS	Geographic Information System
GKM	Gilli Kibbutzsa South Africa Management (Pty) Ltd.
GPS	Global Positioning System
HOD	Head of Department
IAC	Irrigation Action Committee (renamed in 2004 to CCAW)
IAP	Interested and Affected Parties
ICON	The Iterative-Consultative Irrigation Feasibility Planning Approach
IDC	Industrial Development Corporation
IDP	Integrated Development Plan
IERR	Internal Economic Rate of Return
IFRR	Internal Financial Rate of Return
IIPIA	Improving Irrigation Performance in Africa (APPIA in French)
IIRR	International Institute of Rural Reconstruction
IMT	Irrigation Management Transfer
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
JV	Joint Venture

KZN	KwaZulu-Natal
LEISA	Low External Input Sustainable Agriculture
LRAD	Land Redistribution for Agricultural Development
LVA	Loxton Venn and Associates
MBA	Masters in Business Administration
MC	Management Committee
MEC	Member of the Executive Council (Provincial Minister)
MIS	Makuleke Irrigation Scheme
MMMPP	Mpumalanga Management and Mentorship Pilot Programme
NDA	National Department of Agriculture
NDT	Noko Development Trust
NGO	Non-government Organisation
NMPLC	Newlands Mashu Permaculture and Learning Centre
NPV	Net Present Value
NSK	Noordelike Sentrale Katoen
PAETA	Primary Agricultural Education and Training Authority
PPM	Project Planning Matrix
PRA	Participatory Rapid Appraisal
PSC	Project Steering Committee
PTO	Permission to Occupy
RA	Restructuring Authority
RAAKS	Rapid Appraisal of Agricultural Knowledge Systems
RBM	River Basin Management
RBMSIIP	River Basin Management and Smallholder Irrigation Improvement Programme (World Bank and Tanzanian Government)
RESIS	Revitalisation of Smallholder Irrigation Schemes (Limpopo Programme)

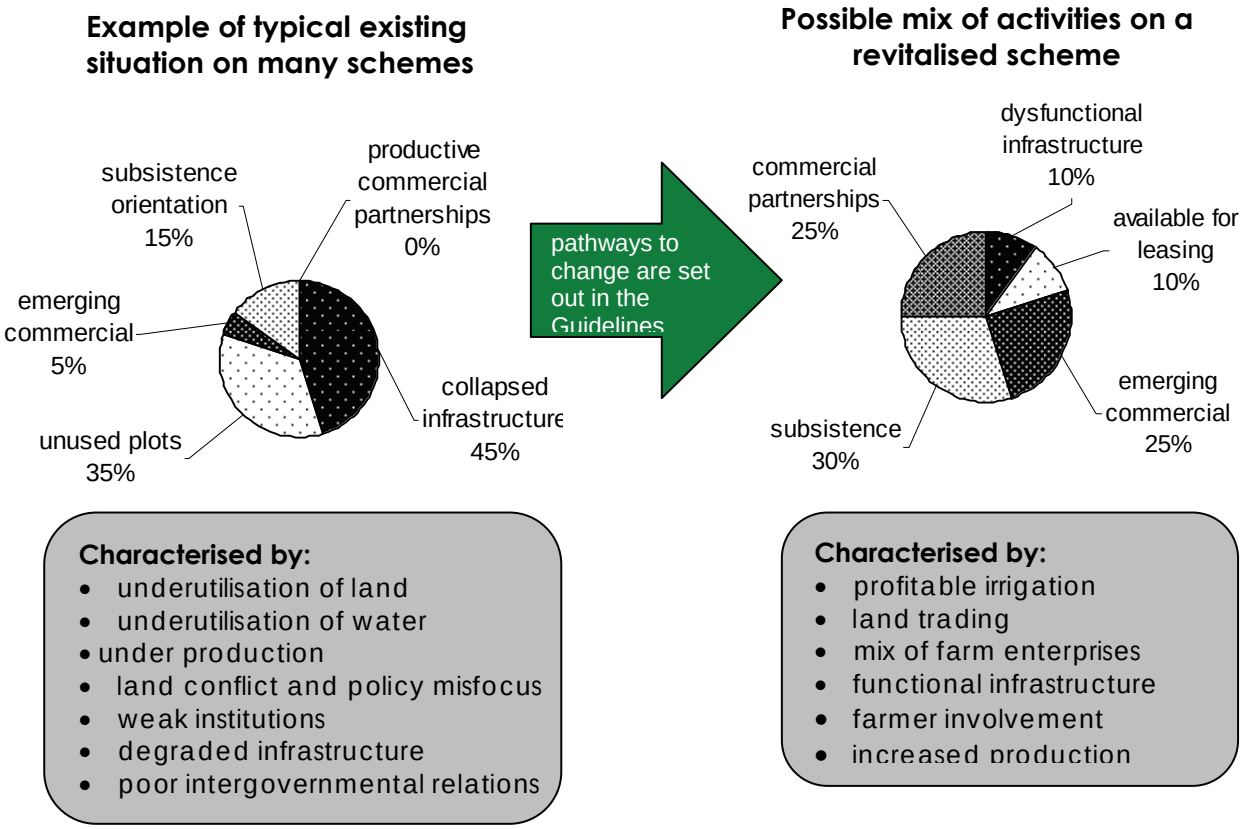
RLCC	Regional Land Claims Commission
RSA	Republic of South Africa
RWH	Rainwater Harvesting
SAFM	South African Farm Management
SANPAD	South African Netherlands Research Programme on Alternatives in Development
SAPWAT	South African Plant Water Requirement Computer Model
SEED	Schools Environmental Education and Development
SIIP	Small Irrigation Improvement Project (of the RBMSIIP)
SLAG	Settlement and Land Acquisition Grant
SMILE	Sustainable Management of Irrigation Lands and the Environment
SMME	Small, Medium and Micro Enterprise
SPSS	Statistical Package for Social Scientists
SSIP	Small Scale Irrigation Project
TIS	Tech-Intensive Schemes (technically complex and capital intensive)
TRAC-MP	Rural Action Committee – Mpumalanga (formerly Transvaal RAC)
UKZN	University of KwaZulu-Natal
WCP	WaterCare Project
WRC	Water Research Commission
WRM	Water Resources Management
WUA	Water User Association

chapter 1 intro

1.1 Why the Guidelines?

The Guidelines for the revitalisation of smallholder irrigation schemes were developed from a three year Water Research Commission Project based on South African and wider regional experiences. There are more than 330 irrigation schemes covering approximately 50,000 ha in the former homelands of South Africa and these are either collapsed or utilised well below their potential. The Irrigation Revitalisation Guidelines have been developed to help planners and implementing agents to address this situation.

People tasked with revitalising collapsed schemes want to know where to start, what to do and how to do it. The fact is nobody really knows, but there are some ideas out there and some of them seem to work. If you are one of the people planning interventions and spending time on the schemes; perhaps a senior departmental official, a municipal agricultural development officer, scheme leadership or an unsuspecting civil engineer who thought you could just go in and do the technical stuff, then the guidelines should equip you to make constructive change.



Schematic: Pathways from existing situation to improved situation
Note that percentages are illustrative only

The Volumes

There are two volumes to the Guidelines:

- **The Rough Guide (Volume 1)** is a quick reference guide for the more action-oriented and is written to allow easy access to the main principles, approaches and methodologies to support and guide implementing teams. Revitalisation activities cover new ground for every case and only one thing is guaranteed - the ride will be rough and you'll have to improvise as you go.

- **Concepts and Cases (Volume 2)** contains the theoretical rationale for the guidelines based on a set of arguments developed through academic review, action research and case study investigation. This includes a review and comparison of South African and international revitalisation approaches as well as case studies on commercial partnerships and other support strategies.

The Rough Guide is not written as an academic document to grace the shelves of learned offices; it hopes to reach the people engaging in the hot and dusty fields who are trying to get it right. If you read nothing else – read and remember the principles on page 7. The rest is nothing without them.

Likely guideline users

The guidebook audience is expected to include people from diverse educational levels, varying skills and interest in revitalisation. These include:

- **Department of Agriculture, Land Affairs and DWAF officials**
- **District Municipal officials and politicians** tasked with strategic input to setting of objectives, steering development approaches and influencing funding decisions.
- **Irrigation scheme leadership** and participant plotholders and farmers who are engaging with external agencies and government in revitalisation initiatives that are taking place on their land and in their communities.
- **Consultants** – often civil-engineering consultants who often find themselves leading multi-disciplinary professional teams engaging in revitalisation because of the large percentage of costs related to the engineering components.

1.2 Meaning of words and phrases

There are many words and phrases that are routinely used in discussions on irrigation and rural development which are understood very differently by people. (Such are the challenges and frustrations that some words are simply not allowed to be put into print). Important terms used in the Guidelines are defined below.

Term	Meaning
Revitalisation	• This is a holistic development philosophy that aims for socially uplifting, profitable agri-business on existing schemes and in the communities surrounding schemes. • It is characterised by whole enterprise planning, human capital development, empowerment, and access to information. It is underpinned by a financially sustainable development strategy alongside repair and re-design of existing infrastructure.
Rehabilitation	• Engineering-centred re-construction of dilapidated infrastructure and is focussed primarily on securing the water supply repairing the irrigation distribution system. • Minimal engagement with the organisational dynamics of water apportionment, the agricultural production system, farmer learning process, financing and market.
Commercial	Farming ventures focussed primarily on production for cash sale (both formal and informal). The term is used in recognition that a continuum exists with a mix of commercial and subsistence activities in many agricultural activities.
Subsistence	Farmers engaging in more diverse livelihoods of which farming is a small part and geared towards food and fodder production primarily for home use. Use of the term acknowledges that a continuum of subsistence to commercial better represents reality with a range of mixed use in between the two extremes.
Plot-holders	People who have legal right to use the land either through entrenched traditional rights (Permission to Occupy), quitrent or title.

Term	Meaning
Farmers	People who are actively engaged in the farming enterprise through investment or direct labour and make the decisions related to crop production and marketing. 'Farmers' can therefore be active on their own land or on land where someone else has the right to occupy.
Agricultural water use	Embraces all forms of human initiative that increase the amount of water available to plants than would be the case under rainfed conditions. Includes conventional irrigation, rainwater harvesting basins, infiltration trenches, pans, swales and mulches.
Multiple water use	The use of multiple water sources for multiple purposes and integration of water planning and design between domestic, agricultural and commercial use.
Smallholder	In South Africa the colloquial meaning is producers who are black and distinct from the large-scale commercial sector (Lahiff, 2004). More specifically in this guideline, 'smallholder' recognises a characteristic of small farm size and a partially developed link to the larger economic system. They are affected by prices, subsidies, markets etc. but the input and output markets are not fully formed and remain localised to some extent. This distinguishes smallholders from commercial enterprises both large scale and family farms, which have access to fully formed external markets (after Ellis, 1998).
Emerging farmer	A widely used and somewhat confusing term to describe someone who engages in agriculture and is black. It is not known when the farmer emerges as no one has yet been defined as an 'emerged' farmer. In this evolutionary case, the validity of applying grants and subsidies remains to be resolved with subsequent impact on financial feasibility (see next box).
Financial feasibility	The calculation of feasibility (including cash flow, financing and risk) from the individual farmer's point of view, including subsidies and grants provided by government.
Economic viability	Evaluates the social return on the investment to the broader economy rather than the feasibility of the individual farm venture. It excludes the actual cost of subsidies, grants and enables decision makers to compare the economic impact of any proposed project in any sector. Target return for investment has to be determined at an appropriate discount rate.

Term	Meaning
Sustainability	Meeting the challenges of the present in such a way that people, the natural resources and the farming system can continue into the future. Originally from natural resource situations it applies to economic development, environment, food production, energy, and social organization. Basically, sustainable development refers to doing something with the long term in mind.
Profitability	The extent to which an investment of capital and management will result in a positive return as evaluated by the investor, who in this case is usually the farmer.
Tech-intensive schemes (TIS)	This is a type of irrigation scheme that was developed in many provinces during the homeland era. They are now characterised by their large size and failure, broken pumps and bleached, leaking pipework. TIS schemes were based on a modernisation and industrial agriculture approach, driven by capital intensive technology (pivots, pumps, sprinklers) and they targeted estate farming as the core of the profit generating enterprise. Social benefits were to accrue through subsidised access to irrigation on small plots for food production (van Averbeke, 1998). Evidence from some of the current revitalisation approaches shows that the TIS approach is still being followed in South Africa with a high risk of failure (see Volume 2, Chapter 3).
Intensification	Is the action to increase crop yield per given resource in a given time period, or both. The resource can include any production factor; labour, water, cultivar, irrigation technology, mechanisation etc. Intensification can be achieved for example through increasing the plant densities of the same crop or by adding additional crops into the existing cropping system. Intensification is often approached through evaluation of the scarcest or most expensive productive factor and intensifying other components of the system to maximise return.
Sustainable livelihoods	A 'livelihood' comprises the many dimensions of an individual's or family's survival strategies to achieve material and social well-being. It includes the capabilities, assets, resources and activities needed for a living. The livelihoods approach is also a way of thinking about the objectives and priorities of development and aims to help poor people achieve lasting improvements against indicators of poverty that they themselves define. It is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation.

1.3 Notes on the jargon

Plotholders

This distinction between farmers and plotholders is important for a number of reasons not least in the discussion on participatory irrigation planning, institutional development, farmer training, land consolidation initiatives and commercial partnerships. It is clearly important to define and **engage with the correct grouping** and there is often confusion as a result of not distinguishing between the two. A second factor to be considered is the role of gender in relation to field-farming activities.

Farmers and gender

The majority of 'farmers' are women who are central to on-farm decision-making, water application, maintenance and related collective irrigation activities. **Women are responsible for some 65% of farming activity** in the smallholder irrigation sector. Yet landholdings in the form of Permission to Occupy (PTO) are generally allocated to men and decisions in meetings are often made mainly by men. The importance of scheme and farm level gender power dynamics, inequalities, processes of information dissemination and truly representative decision-making must be addressed consciously by gender-skilled people within the revitalisation teams for any chance of success. Failure to actively ensure gender power imbalances are constructively addressed is likely to leave large numbers of key players (i.e. the women) excluded from the processes with subsequent failure of the interventions.

Subsistence and commercial

A simple division between commercial and subsistence farming does not capture the complex mixed systems that are prevalent in communal areas in both rainfed and irrigated contexts. Andrew (2003) shows that crop production in communal areas is usually semi-subsistence with some sale or trade of surplus, mixed with animal production and environmental resource use. These contribute to lower risk livelihoods and supplement urban based income streams (remittances, grants, pensions). Characterising agriculture in communal areas with simple dualistic stereotypes of commercial and subsistence means that your strategies can miss opportunities and then fail to meet objectives.

First, many small-scale producers are currently involved in production for the market along with self-provisioning and this a robust part of their livelihoods mix. Any assumption that these mid-continuum producers in all cases wish to progress from 'subsistence' to 'commercial' production denies their well-established systems and their interest levels in farming.

Secondly, in an economic evaluation the contribution of subsistence production when valued in monetary terms often excludes significant components such as environmental resource use, informal trading, animal traction, local transport, medicinal plant use and shelter among others. Evaluations which consider the simplified (dualist) categories will therefore not represent the real economic situation and will improperly advise funding decisions.

1.4 Working principles

Respect

Respect is about helping put people in the driving seat of their own lives. It is about project team members putting themselves in other's shoes and not assuming that they are experts in other people's lives. It is about having **respect for other's judgement at all times**. This is demonstrated by listening, by sharing knowledge with humility and by learning from those on and around the schemes. Respect is the fundamental principle of engagement with people on which everything else rests. Certainty of viewpoint and lack of time to listen are inherently disrespectful and are a magnet for failure.

Profitability and economic viability

Profitability, in the broadest sense and as provided in the earlier definition is a principle which impacts on the development of options and decision-making on ways forward. There are presently many funding decisions on schemes which are not based on a principle of profitable gain for the beneficiaries or benefit to the larger economy, but are motivated by external reasons – often political or even just end of year budget dumping exercises. **Evaluating profitability demands farm enterprise budgeting**, estimating returns for management time and financial investment and communicating this to the range of people involved for their consideration and approval. Upholding a principle of profitability for farmers and economic viability means that ad-hoc investments made on unfounded assumptions of their economic, financial and social value can be avoided.

Participation

Participation is an obvious but often ignored principle of engagement that is embedded in the guidelines and the strategies. What is essential in participative planning is co-construction of the solutions, not simple attendance to meetings which are then classed as 'participation'. The revitalisation teams must listen to the stories and the opinions, provide new information, inform on the consequences of choices and assist in the interpretation of findings. The **principle of participation must be implicit in all dealings** from the initial explorations of opportunities, current successes, tensions, problems to the discussion of how to seek solutions and the decisions on ways forward.

Community control

Irrigation schemes are characterised by diverse interest groups, in many cases with conflicting agendas. Civic and tribal boundaries of interest and control often overlap on schemes. Community control is a key principle, but is impossible to apply without giving attention to the de-facto institutional structures and the representation that actually results. Thus community control demands **interrogation of existing 'representative' structures** and possibly the modification or formation of new transitional or formalised institutions that give meaning to the concept of 'community control'. A wide range of local meetings at all levels from district to homestead levels will enable people to contribute and assume responsibility for the process conducted on their terms.

Inclusion

Everyone's voice is important. The case studies and wider experiences show clearly that failure to address the broadest group possible is likely to result in conflict and power struggles later in the process. Speaking and listening to community 'leadership' is not sufficient and the opinions and needs of a wide range of people must be elicited (see Makuleke case study lessons). The consultation processes outlined in the Guidelines aim to **identify those who are marginalised and do not usually raise their voices** in public gatherings or group discussions where leadership individuals are present. Most 'farmers' are women (65%) and women often do not have a strong 'voice' in community gatherings – the consultation strategy must address this explicitly.

The withdrawal of the marginalised from the process before it commences is either from hopelessness (linked to many reasons including poverty), lack of interest given the history of repeated interventions that have lead to little improvement, or from powerlessness implicit in the social structures and forums. Thus the voice of women, the youth and the old must be actively sought. The consultation strategies presented in Chapter 2 specifically address the less vocal and marginalised.

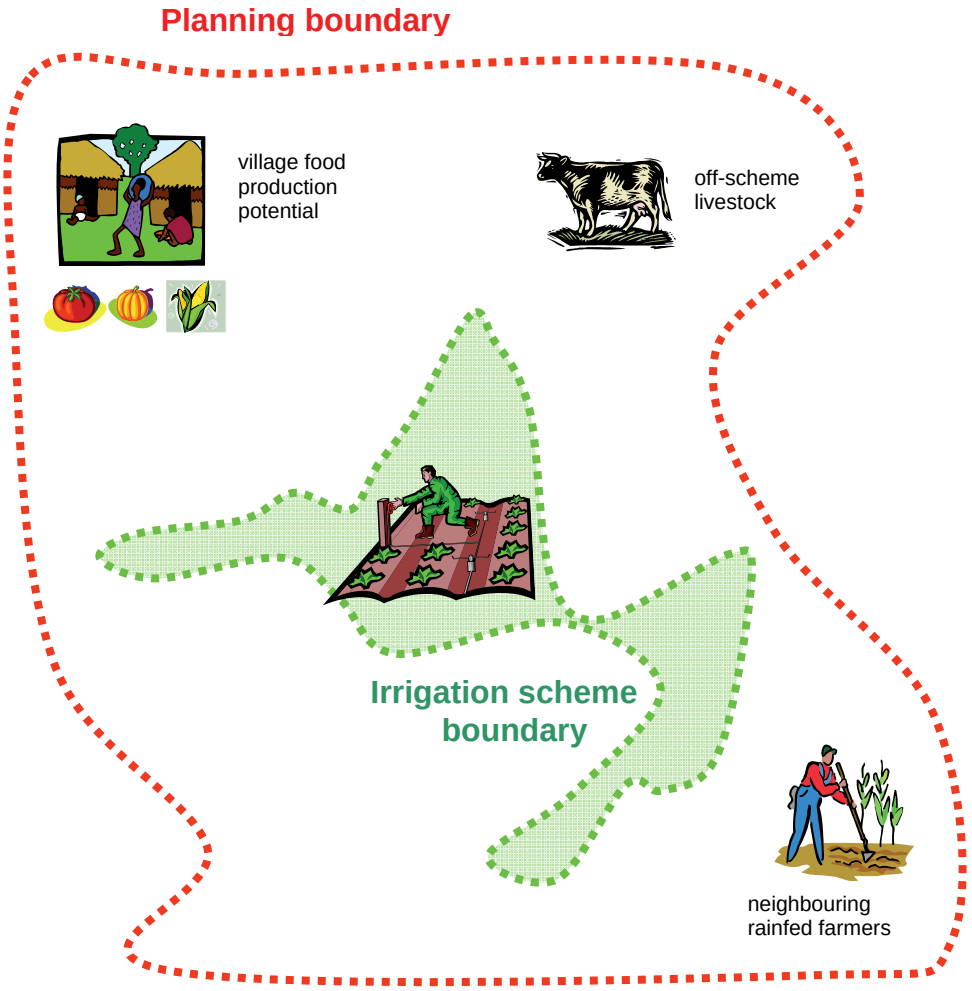
Diversity

Recognition needs to be given to the fact the schemes, the farmers on them and communities around them are not homogenous entities and that conflicting interests and goals are likely to be present. The underlying principle is that diversity is good. This needs to be clearly stated and dealt with in transparent and accommodating ways. People's different interests and expected outcomes should, as far as possible, be accommodated by a flexible implementation plan. Generic solutions planned for a whole group of schemes run contrary to the reality of scheme diversity. **Generic solutions** even on a single scheme **deny the diversity of interest**, opportunity and varying needs of the plotholders.

Expanded scheme boundaries

The impact of the scheme extends well beyond the physical borders of the irrigated lands. Peoples' relationships with the irrigation activities are tied to their other livelihood activities, rainfed farming and animal practices. There is a need to consider a broader view of what constitutes the sphere of engagement with the "irrigation initiative" as there are possibilities for synergy to the benefit of the irrigation scheme. This broader group thus includes:

- The conventional target group of plotholders and farmers,
- A wider target group which is the community as a whole, including surrounding villages with social, religious and economic links to, or interests in the scheme,



This is specifically to recognise the context within which a given initiative is situated and explores issues of resource access, institutional and power relationships and de-facto resource allocation. It also provides an overview of the role of the scheme in its region.

Transformation

The underlying context of poverty needs to be transformed, rather than merely alleviating the effects. This means that the planned scheme intervention (which will include differing emphasis on food production and agri-business orientations) are part of a wider mix of local economic development initiatives that are welcomed into the planning process.

The need to address poverty by a broad range of initiatives is undertaken with full cognisance of the inherent conflict in separating the commercial agri-business objectives (i.e. primarily financial objectives) from the need for food production and food security (Chancellor et al., 2003). The four farming styles in the guideline allow for a mix of outcomes on any scheme to meet these diverse needs, both on the irrigated lands and in the adjacent villages. The participative planning methods discussed later are some of the ways to arrive at that mix in full consultation with plotholders, farmers and the surrounding community.

Learning process

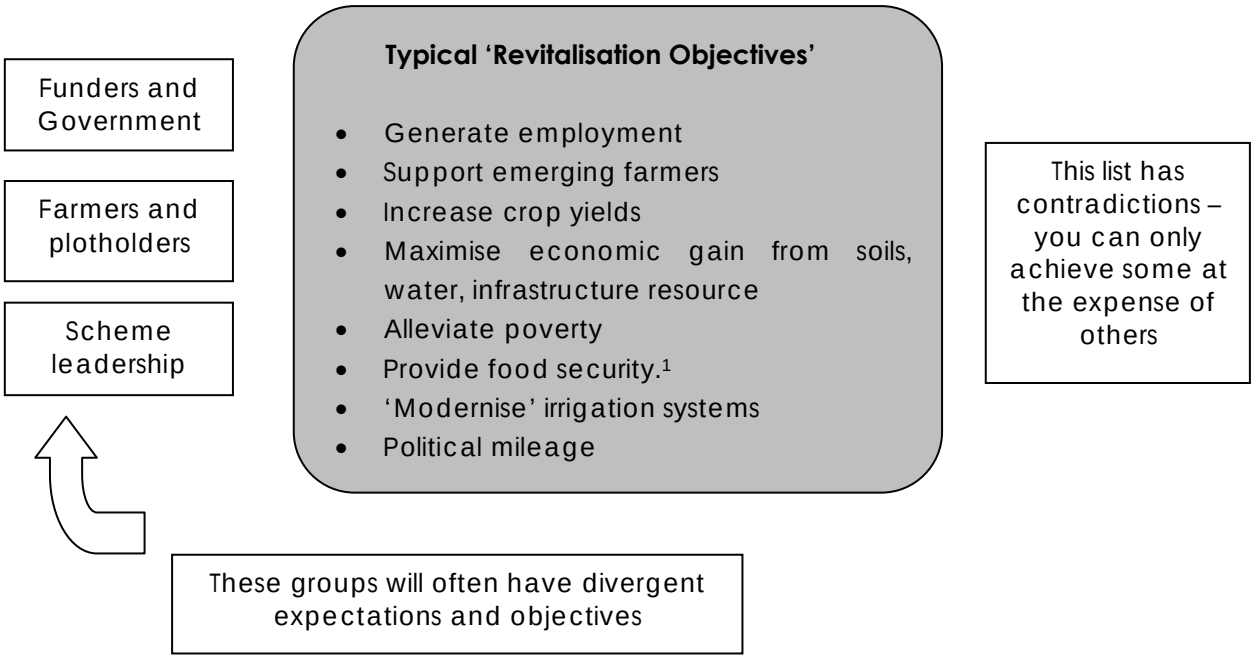
The learning process is one that everyone who is involved, both on the part of the planning team and the various groups and individuals in the community are a part of. This **includes the facilitators and the technical team** members. There are no experts who can develop solutions from an outside perspective and the best solutions are those that are developed together.

Sustainability

Project planning and implementation need to aim for the benefit of participants long into the future. Sustainability implies that the project is based on acceptable levels of financial independence (reducing over time) from donors and funders and with acceptable levels of impact on the natural environment. All elements of the revitalisation plans; institutional, land access, farm systems support, crop production methods and partnerships of various kinds must be guided by sustainability thinking. Timelines are important in sustainability thinking. Investments in irrigation infrastructure understandably have limited timelines (perhaps 20-30 years). Similarly a commercial partnership might be based on a five year lease. Thus a partnership which only lasts five years may well still be sustainable, even though it does not stretch over the entire thirty year project. The implications of capacity building, exit strategies etc. will extend beyond the five year period so sustainability thinking cannot be applied rigidly and must **be used as guiding concept**, rather than a defining one.

1.5 Understanding objectives
Why and what do you want to revitalise ?

Irrigation revitalisation often seems to be an objective in itself and this sets the stage for conflict and confusion between parties. Municipal and Departmental Agricultural Development Plans often state 'revitalisation of irrigation schemes' as an objective. But what exactly is wanted as an outcome?



The objectives above are open to interpretation and are therefore dangerous concepts to be left undefined because different people will understand them differently. The assumption of common goals can only result in one or another party seeing outcomes as a failure. It is also impossible to plan coherently without crystal clear objectives which are agreed with Government funding bodies and the 'broader community'. Clear objectives must be defined and maintained as a visible reference point of all thought and decision-making.

Not only are revitalisation objectives sometimes vague, but on closer consideration they are often in conflict with each other. In some cases you can only achieve one at the expense of another.

[1] *Food security in the irrigation revitalisation context is only really practical on schemes which have low operations and maintenance costs (ie. generally flood schemes). This is discussed in Chapter 2 and is due to macro-economic benefits from investment and the financial reality of high pumping costs.*

Employment creation and food security for example tend to go against each other. Employment creation demands an income cash stream to pay labour and supervisors, which steers the agricultural enterprise to medium or higher value crops. Maximum employment opportunities arise from intensive labour requirements on-farm and where there are post-processing opportunities.

Food security crops on-scheme will not provide these opportunities. These objectives can however be reconciled when one extends the project impact to beyond the boundaries of the irrigated lands and include intensive food production in home food gardens for example. This strategy is expanded on in the chapter on "Intervention Strategies".

Poverty alleviation and the 'modernisation' of flood irrigation systems through the introduction of capital intensive sprinkler or drip systems is one of the strategies thought to bring positive results. However, 'modernisation' of flood schemes means that farmers must face high maintenance and pumping costs on a monthly basis, which immediately shifts the possibilities on existing flood schemes to higher-risk and higher-yield production methods. Risk-aversion is a well documented survival strategy of poor households and thus 'modernisation' (with the increased risk that results from necessary crop choices and their market implications) runs contrary to a lower-risk poverty sensitive strategy on a scheme.

What is important in the above discussion is that objectives must be thought through with all parties, defined and agreed. The planning process can then be properly informed by the objectives that have been set.

1.6 Balancing objectives and benefits

The strategic approach attempts to balance the unavoidable tensions between a number of real-life development and political factors which include the following:

- The **aim of developing Small, Medium and Micro Enterprises (SMMEs) and emerging black farmers** which require long timelines (see the Noko Case Study in Volume 2) and substantial financial investment in training and mentorship as part of a growth curve to achieve acceptable levels of production and resource utilisation.

- The need to **responsibly use limited land, water and infrastructure** resource utilisation for economic benefit to the region. The predominant agricultural production approaches tend towards mechanised, high-yield and higher risk commercial farming styles. New methods emphasising lower-risk and lower-input production methods such as conservation agriculture are increasing, but mainstream thinking currently steers projects towards replicating the commercial sector crop production approaches on smallholder schemes.

- **Social benefits in the form of employment creation**, poverty alleviation and food security (expanded to off-scheme interventions as well). These have quantitative as well as other benefits linked to quality of life of the participants on and around the schemes. The experience of labourers in a commercial Joint Venture is socially different from that of someone leasing land to an emerging farmer, or to a smallholder on a gravity fed plot growing diverse crops using low-risk and low-cost methods.

- The need for **irrigation scheme farmers to cover their own operation and maintenance costs** (including pumping, management and water tariffs) as dictated by policy. This will be in keeping with the financial and operational demands of the irrigation system and impacts directly on the options open to participant farmers given costs they are likely to face.

Each of the above bullet points has political and funding implications at District, Provincial and National levels and is subject to a range of policies (eg. Agricultural water use policy, DWAF irrigation subsidies, Dept of Agriculture Subsidies such as the Comprehensive Agricultural Support Package (CASP), District Integrated Development Plans (IDPs), Provincial Development Plans) which do not concur at all points on their objectives. Municipal funding is in many cases fire-fighting grant funding that is not in keeping with CASP or DWAF bulk water subsidies – phased out neatly over five years.

The collection of approaches that form the strategy, allows for an evolutionary and interactive development of suitable scenarios in full recognition of the above political realities. The intention is to commence a process which allows a set of production plans to evolve while acknowledging that the agricultural market and technical reality is fast changing.

The dynamic nature therefore defies global application across the diversity of a number of schemes, or even the diversity within any one scheme. A mix of possible outcomes (commercial emerging farmers, large scale strategic partnerships with agri-business, low risk medium yield extensive production, etc.) could work alongside each other, in an ever changing pattern as the demand and opportunity evolves.

Any initiated intervention that is flexible enough so as to accommodate outcomes beyond those imagined by the broader planning teams is more likely to succeed.

Case study

Modernisation

The concept of 'modernisation' is often incorrectly associated only with capital intensive investment in high-tech infrastructure (i.e. drip systems or similar). This is a narrow perspective and scientific research as well as field experience shows that flood irrigation is in many cases a superior technical solution for some soils and crops (Crosby et al., 2000). Short furrow irrigation, a newly documented technique in South Africa is, for example, highly efficient. The organisational problems and inefficiency of many flood schemes can be attributed to age and large hydraulic units which make farmer operational control difficult. These are discussed later and can be re-designed if appropriate – but the point is that new innovations in flood irrigation layout design and infield design are as modern as drip. Try to explore the real benefits of all options – even those that might initially seem contrary to what you know.

Case study

Perspective from Ludiza

During the planning process at the 40 ha scheme of Ludiza in the Eastern Cape, objectives were explored with the plotholders and the District Municipality. What transpired was that many of the plotholders simply did not want to farm but wanted access to employment opportunities. The District Municipality wanted to invest in support of broader social and economic impact, with emphasis on poverty alleviation and sustainability. Lucerne was a robust crop, relatively simple to grow and market, and was well-suited to objectives of establishing emerging farmers. However Lucerne relies on mechanisation of the 40ha unit with little labour benefit. The alternative was mixed vegetables. Mixed vegetables are more challenging in terms of production skills and marketing but were chosen because of the labour benefits. The engineering design used a 'short furrow' system which is cheaper to operate than sprinklers as there is no pumping cost and is technically and financially more sustainable. The objectives of improved food security were addressed by an intensive home food garden program with grower learnerships and rainwater harvesting tanks.

chapter 2 challenge your thinking

2.1 Need for additional concepts

This chapter outlines some important, if diverse concepts that can be added to the knowledge base usually applied to smallholder irrigation planning. Often irrigation planners look at a simplified range of technical issues focussing on soils, water, crop suitability and irrigation technology. Less frequently, but more encouragingly others include planning around inputs and mechanisation, labour, produce processing, market potential, costs and benefits. However, it is clear from the many failed attempts in revitalising communal irrigation schemes that even broader thinking is needed to generate successful outcomes. Some of the concepts presented below will add depth to the strategies that you are already likely to be proficient in or be aware of.

These may at first appear to be disconnected from conventional irrigation issues but you will find that combined with the remainder of the Rough Guide, they highlight opportunities that will strengthen your planned intervention. These ideas and strategies are not prescriptive but are a collection - some will be appropriate to your situation on one scheme while others won't. The concepts discussed in this chapter are:

- Balancing objectives and benefits
- Intensive home food production and the land-leasing link
- Multiple use of water and irrigation
- Alternative crop-production paradigms
- Four theoretical farming styles as a planning tool
- Re-design and hydraulic units of management.

The full rationale arriving at the strategic options for development are presented in detail in Volume 2 and are substantiated with data and theoretical discussion. The rationale is summarised overleaf.

2.2 Theoretical rationale underpinning the Rough Guide

This section presents a quick summary of the more extensive theoretical discussion in Volume 2, Chapter 5.

Profitability

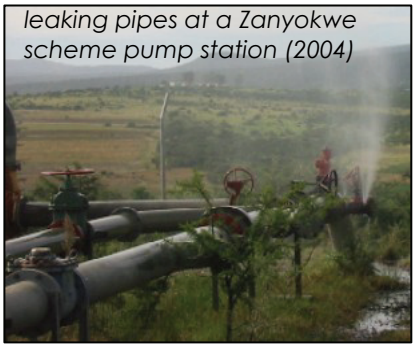
Profitability is widely considered to be a critical factor for the success of schemes. Backeberg (1995) evaluated the history of South African irrigation schemes and found that the success of irrigation development in the past can be related to marketing potential of produce and the level of profitability of farming. Similarly, an analysis of the national database of smallholder schemes established as part of this project showed clearly that commercialisation (as opposed to subsistence farming) and the production of higher-value crops (notably bulk and specialist vegetables) were common denominators in schemes which had high levels of activity or success. This does not imply that a range of other elements are not also key components of a successful irrigated farm operation, but suggests that without profitability, even if all of these other components are in place the efforts are unlikely to succeed.

Commercialisation and technical determinism

The government's policy on agricultural water use highlights the fundamental importance of economic viability and financial feasibility of interventions funded with state money, It is generally expected that investments show a positive rate of economic return (in the region of 6%) and cover all water charges and operational and maintenance costs (more detail on financial aspects of evaluations is provided in Chapter 4).

Irrigation revitalisation investment costs of three recent South African provincial programmes were found to be similar to each other and in keeping with the range of sub-Saharan African programs (R30,000 to R59,000 per hectare, detailed in Volume 2, Chapter 3 and Chapter 5). These costs were however so high, even with subsidies in place, that they forced crop production strategies with high returns per hectare leaving little option in most cases but an explicit commercialisation agenda focussed on sale to external and more distant markets.

Technical and infrastructure realities on many schemes (especially tech-intensive schemes (TIS)) cannot easily be altered which means that technological determinism plays a role on financially feasible production choices. The expense of running high pressure pumping systems ups the ante and demands a higher risk / return enterprise approach.



leaking pipes at a Zanyokwe scheme pump station (2004)

In practical terms, this means that high operation and maintenance costs force greater engagement with a cash based production system to cover monthly pumping and operational costs, whereas lower financial running costs associated mainly with gravity and flood schemes can accommodate a range of production approaches (although importantly, flood demands more labour, organisational effort and conflict resolution for the farmers which are 'hidden' financial costs).

The polarising effect that high investment costs have on farming styles in the irrigation revitalisation context means that future planning strategies and approaches have great difficulty avoiding a dualistic separation of the intervention strategy into 'commercial' and 'subsistence'[2].

The exception to this documented reality is where low-cost infrastructure interventions are made on existing gravity and flood schemes or where investment is targeted mainly in improving crop-production methods through training, provision of finance and access to limiting inputs and output markets.

The important point to bear in mind is that experience in revitalisation shows that it is generally costly. As a result of this high investment cost and the need to meet targets for economic rates of return from that investment AND to meet the often high operational and maintenance costs that result from most rehabilitated schemes, the returns from crop production must be high. This forces a production strategy which maximises financial returns and with associated high risk.

Farm size and net return per farmer

The amount of money needed by an individual to justify their ongoing commitment to irrigated farming (given the financial risks and the lifestyle implications) will of course vary widely. The reality is that in many cases, the prevailing smaller plot sizes on schemes (1 to 1.6 ha) are unlikely to yield sufficient cash income to cover water charges, maintenance, organisational costs and net profit.

Medium and low value crops: Average incomes per ha in an ARCUSGIBB study (2004) with a mix of medium and high value vegetables at modest yields, showed net profits of R8,000 to R10,000 per ha per annum (after all farming, labour, input costs, etc.). Net returns on cotton partnership schemes typically show R1,500 to R2,000 per ha or less. The feasibility in all cases is highly sensitive to yield variations and is therefore risky. While economic viability might be justified for the whole scheme, it is abundantly clear from the research that farmers hesitate to invest their energy, time and scarce resources for these risky and low returns per small plot (i.e. 1 to 1.6 ha per individual).

[2] *For the purposes here, 'commercial' means the adoption of higher-risk / higher return production approaches geared to external markets, and 'subsistence' is engagement with lower risk farming styles, more geared to diversified livelihoods and food / animal fodder production.*

In relatively few cases farm sizes on schemes are substantial (4 to 5 ha) and this argument will not hold as much importance, unless the plotholders are not interested in farming, in which case land-leasing is centrally important.

It seems unavoidable then, to actively address:

- EITHER the issue of land consolidation so as to ensure larger farm sizes with greater return per individual,
- OR the acceptance of production risk by an external party, which could be government or a commercial partner. This will be an exceptional situation and is only likely to apply to a scenario where a commercial partner effectively farms on behalf of the farmers (lease of large portion of the scheme), thereby mitigating risk by direct responsibility for the farming.

Avoidance of the land allocation and consolidation challenge means that intervention initiatives will have great difficulty in moving beyond marginal benefit to individual farmers as annual returns of a few thousand rand at substantial risk are unlikely to be accepted as sufficient reason to continue engaging in farming.

High value crops: It is theoretically feasible that smallholders can generate sufficient income off smallholdings through high-value horticulture, mainly flowers, fruit and vegetables. Experience from the Land Reform Programme shows that this theoretical superiority has not yet been translated into the successful establishment of small-scale farmers (Cartwright, 2002) and is cause for caution. One of the central challenges facing high-value horticultural crops is the existence of a sophisticated logistical chain between the producer and the end consumer. Horticulturalists on small tracts of land have to be successful at both the sophisticated crop production process as well as at contracting with the agribusinesses that control the marketing of high-value food chain (Cartwright, 2002, paraphrased). Backeberg (2006) shows this to be seriously challenging given South Africa's historical legacy which tends to exclude emergent farmers from those networks and which is made more severe given a global market environment. One of the few options available to achieve the necessary access to higher value markets is then to engage in contracts with the agri-business sector.

Land consolidation inevitable on tech-intensive schemes

It is evident that adoption of a low or medium value cropping approach which are more achievable in terms of production skills, management, finance and training requirements leaves little option but to engage with land consolidation (say 5 to 40 ha) to generate sufficient income for an individual farmer on his or her parcel of land.

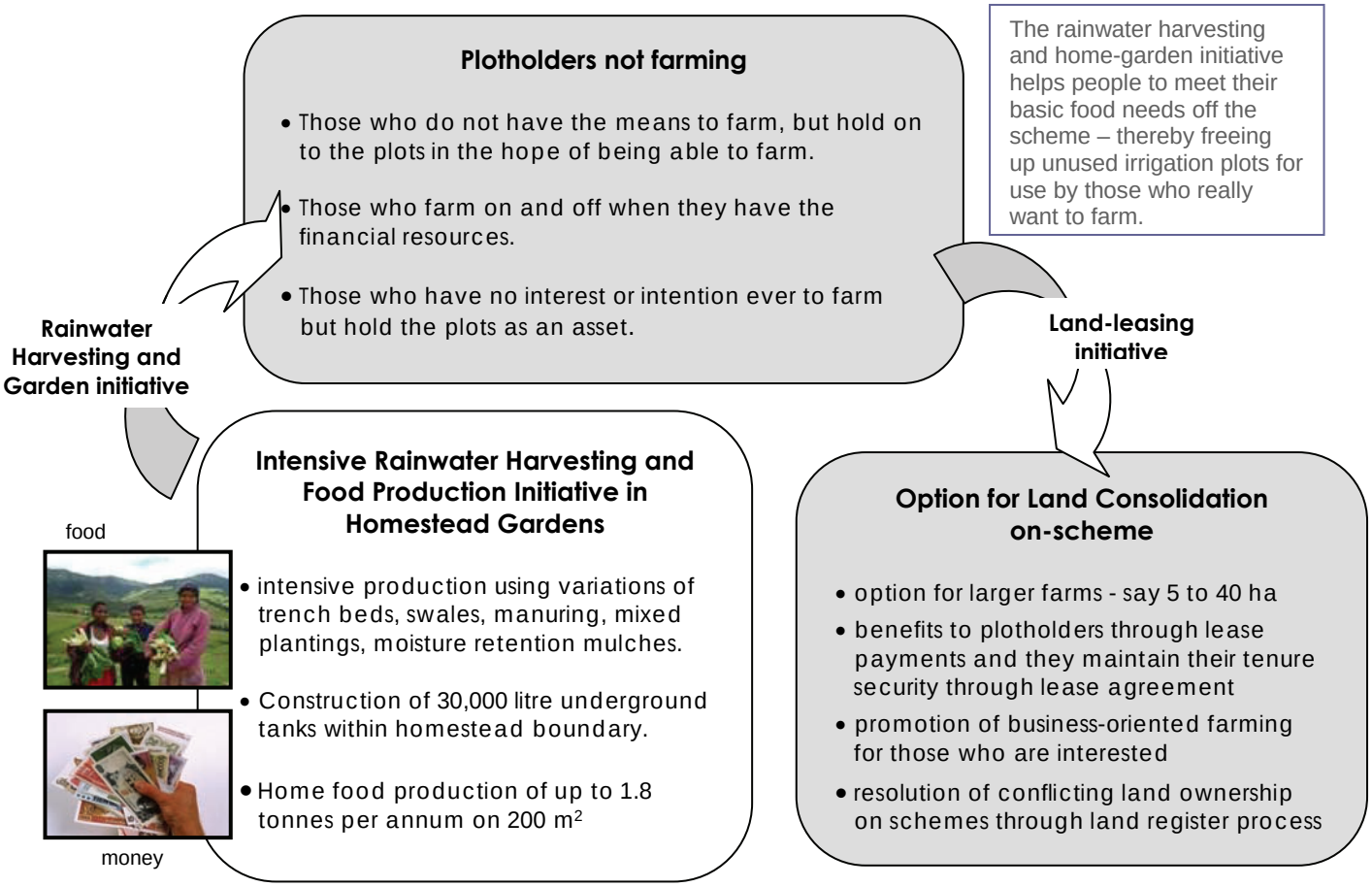
Similarly, adoption of high value horticulture crops and the subsequent need to successfully engage with the highly competitive and strict quality controls of agribusiness seems to demand an engagement with contract farming in one or other form. In this second instance land consolidation is still likely to be required given that packers and agri-processing companies generally require commitment of substantial hectarages to ensure a secure supply of produce to meet delivery contracts.

As a reminder, the exceptions to this argument are those isolated schemes which have low investment costs (for revitalisation) and those schemes with low operational and maintenance financial costs (albeit often with high social transaction and time costs). These are mainly the more simple flood schemes developed in the 1960s and 1970s. In these cases 'modernisation' should be considered with substantial caution as other more sustainable options, which have lower risk and offer more flexibility in the farming style may be better suited.

2.3 Catalyst for the land-leasing process

Experience shows that many people who have irrigation plots don't want to engage in irrigated farming on the scheme because of limited resources, skills, interest and the high risks of farming. However, they are often reluctant to lose their access to the irrigated plot given their poverty status and the potential the land holds for production perhaps at a later stage. **These people can have their basic food needs met an intensive home-garden initiative and this frees up the irrigated plots for land-leasing.**

Intensive diversified home food production underpinned by rainwater harvesting and grey-water re-use present a valuable opportunity for breaking out of the limiting cycles posed by small plot sizes on many schemes. The inter-relationship is shown schematically below:



Not only does this approach stimulate more viable irrigated farming but it successfully targets one of the primary needs of households in poverty – hunger and malnutrition.

Success is partly linked to the deep trench intensive gardening approach, grey water re-use and the rainwater harvesting methods. Importantly, underground storage of approximately 30,000 litres is required to support production through the 3 to 4 month winter period. Gardens and tanks are within the homestead boundary and therefore wholly controlled by one family avoiding the complexity of communal ventures.

deep trench excavation

Definition of Rainwater harvesting: According to IWMI and FAO, rainwater harvesting is the collection and concentration of runoff water for productive purposes. It is also defined as all the methodologies of concentrating, diverting, collecting, storing, utilizing and managing runoff for productive uses. Water can be collected from roofs and ground surfaces for domestic uses, stock and crop watering. To overcome the unpredictability and unreliability of rainfall in our part of the world, rainwater harvesting strategies propose to 'slow down, catch, store and use every drop that can be used.

Grey water is the end product of domestic activities (bathing, washing dishes and clothes and cleaning) and this water is available throughout the year. After domestic activities, it is collected into a drum. Ash is added to separate out the soap, and the cleaned water is then scooped out when it is needed for irrigation of the food crops in the garden. This water is not suitable for drinking or animal watering.

Stormwater runoff collection applies to water running off roads, pathways, roofs and the veld during a rainstorm and is an important source of water, seldom stored locally. This can be diverted and stored in tanks or dams. In villages this water often poses a threat because it runs fast, causes erosion and damages fences, roads and houses. Surface runoff can be diverted directly into the cropped area or into storage tanks. Only small trenches and furrows are needed to control and divert the flow. During this process, the deep-trench beds are irrigated directly and surplus water is diverted into tanks for irrigation in the dry months.

stormwater runoff to 30 000 litre underground collection tank

In-situ rainwater harvesting relates more to field crops and means that rainwater is collected in the field during a rainstorm. In-field earth bunds or lines of stones or hardy plants hold the water back so that it infiltrates into the soil profile instead of running off. The water collected using this system is stored in the soil profile. Techniques such as mulching, brimming and adding organic matter to the soil profile helps to increase the infiltration rate and water holding capacity of the soil.

2.4 Multiple use of water and irrigation revitalisation

The conventional technical approach to water supply is to provide water for a single purpose, either domestic water or irrigation. However, evidence in both the irrigated and the domestic water supply scenarios shows that people use whatever water is available for many things, such as domestic use, gardening, car washing, animal watering and brick fabrication. The International Water Management Institute (IMWI, Working Paper 74) motivates for broader water related strategies in the South African rural context.

Water planners in both domestic and irrigation generally avoid the complexity and uncertainties related to mixed water source exploitation, particularly rainwater harvesting at a localized scale. The challenge of raising awareness on the important aspects of water conservation and water re-use (recycling homestead grey-water to gardens) is often avoided as these community processes are not technically centred and often lie outside of the specialist area of water engineering. New research on runoff storage relationships (roofs, ground surface to dams to tanks) in 2004 (Water for Food Movement, 2004) now provides a scientific basis for carrying out the water yield and consumption evaluation linked to home gardens. The DWAF Rainwater Harvesting Pilot and Demonstration Programme nationally was implemented in 2006 on similar principles.

The poverty related benefits of food production in home gardens impacts on the day to day livelihoods of poor people, with impact on their relationship and needs from the irrigation scheme, are not well facilitated by narrow definitions both scheme boundaries and limiting the purpose of a water supply system to one use. Typically the gardens are located immediately close by and can be worked as part of a daily household routine on an ad-hoc basis; childcare, gardening, watering with grey-water all take place safely and time efficiently.

Use of water by any community is rarely exclusively for only one or the other purpose and systems that consider multiple use (and multiple sources) respond more readily to the diverse needs of people on schemes and adjacent to schemes, by providing them with different alternatives and options to meet food production needs which impacts the scheme planning process.

2.5 Crop production paradigms

Mainstream commercial approaches

The dominant crop production approach that is implemented or supported on most smallholder irrigation schemes is in line with mainstream commercial sector. This is characterised by mono-cropping and machine-intensive farming methods. These rely heavily on input-markets for seed, fertilizers, pesticides and with the high mechanisation for land preparation have high input costs. Profitability demands high yields and a high-risk approach to production. Although the margins in agricultural production are declining there is only limited uptake of alternative crop production methods. These attempt to either encourage more 'traditional' farming methods which are less market dependent and have lower input costs or other innovations that attempt to increase profitability and reduce risk as primary goals, rather than prioritising yields (regardless of profits). Lahiff and Cousins (2005) argue that the "dominant narratives of the efficiency of large scale agriculture exerts a stranglehold on rural policy" and that crop production methods applied in the commercial sector are simply scaled down for smallholder farmers which is inappropriate. Similarly, Botha and De Lange (2006) argue that "smallholder farmers currently have limited access to training ... formally available training is focused almost exclusively on scaled-down versions of high-cost, high-risk commercial production practices, which are inappropriate to food insecure households."

Pragmatic consideration of alternatives

Crop production approaches must be viewed in the same light as all other issues in revitalisation planning – the merits of each case must be considered pragmatically given all other factors at hand. There are alternative crop production approaches which seem much better suited to some of the 'four' farming styles outlined later in this chapter. One of these choices is Conservation Agriculture which is receiving substantial research focus by the Agricultural Research Council and the Department of Agriculture nationally. In South Africa, conservation agriculture has not been formally applied to the smallholder irrigation context, other than the real fact that many 'traditional' cropping methods have similarities. However, in the international context conservation agriculture is routinely introduced due to the emphasis on risk reduction and reduction of input costs. This is one alternative crop production approach that warrants consideration in the mix of ideas for formulating the intervention plan.

An alternative choice would relate to intensification, applicable to any resource, mechanisation, plant densities, water, etc. Intensification of labour is however one aspect that is not often considered but which presents low-cost and sustainable advantages instead of reverting to the conventions of machinery and sprinklers.

Overview of conservation agriculture

Information on conservation agriculture is widely available on the internet and excellent advice is available from the ARC. The ARC is also a possible partner in developing and implementing conservation agriculture approaches on projects. Conservation agricultural production methods aims to produce high crop yields while reducing production costs, maintaining the soil fertility and conserving water (IIRR and ACT, 2005). It is a way to achieve sustainable agriculture and improve livelihoods. Conservation agriculture has three basic principles:

- Disturb the soil as little as possible (zero or minimum tillage)
- Keep the soil covered as much as possible (mulch and cover crops)
- Mix and rotate crops.

seedlings in mulch
photo: Hendrik Smith

Because each farmer faces different situations conservation agriculture cannot be applied as a routine process. It is a scientific approach based on experimentation and learning. Some farmers may find it best to introduce a cover crop first. Others might gain by reducing their tillage to "ripping" (using a narrow plough-like implement that creates a small furrow without turning the soil over) or "pitting" (digging planting holes with a hoe) as a first step towards conservation agriculture. In a second step, these farmers can leave crop residues in the field and start planting cover crops.

Practising conservation agriculture can be a challenge as it means a different way of farming. Farmers may be reluctant to make the switch, and they need to learn new skills. It also means a new mindset: for example, they have to learn that a "clean" field is not the best. But the benefits are real. Farmers quickly find that by applying these principles, they can save labour, reduce costs, and improve their soil's fertility and ability to hold water. That means higher crop yields. They can use the time they have saved to expand the area they cultivate, or even to start other enterprises that earn more money. Conservation agriculture presents a chance to break out of the vicious circle that binds farmers in input debt and poverty.

Disturb the soil as little as possible: In conventional farming, farmers plough and hoe to improve the soil structure and control weeds. But in the long term, they actually destroy the soil structure and contribute to declining soil fertility. In conservation agriculture, tillage is reduced to ripping planting lines or making holes for planting with a hoe. The ideal is to plant direct into the soil, without ploughing.

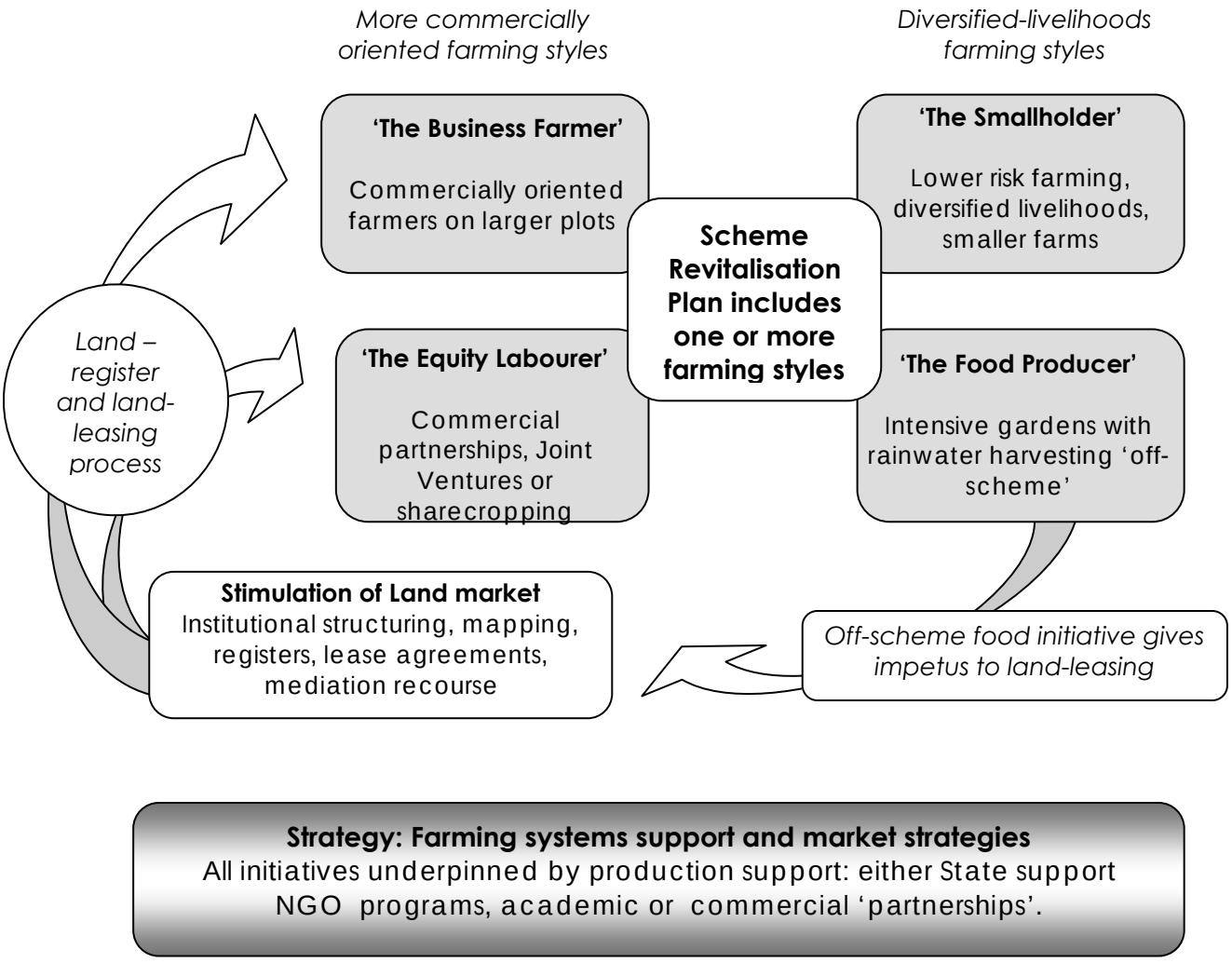
Keep the soil covered as much as possible: In conventional farming, farmers remove or burn the crop residues or mix them into the soil with a plough or hoe. The soil is left bare, so it is easily washed away by rain, or is blown away by the wind. In conservation agriculture, crop residues left on the field, mulch and special cover crops protect the soil from erosion and limit weed growth throughout the year.

Mix and rotate crops: In conventional farming, the same crop is sometimes planted each season. That allows certain pests, diseases and weeds to survive and multiply, resulting in lower yields. In conservation agriculture, this is minimized by planting the right mix of crops in the same field, and rotating crops from season to season. This also helps to maintain soil fertility.

2.6 Four farming styles at planning stage

The development of the strategies for irrigation revitalisation have been based on four groups of farming styles which are shown schematically below. During the evaluation it will become clear which of these groups can co-exist on a scheme, due to aspirations of people and the harsh financial realities which dictate lower profitability limits dispassionately. By composing these four theoretical farming styles a suite of strategies can be formulated to meet their general needs. These needs are sufficiently distinct so that they must be catered for with different strategic packages. Once the project reaches implementation the actual plan that is formulated on these broad typologies will contain all of the main elements and will be flexible enough to meet the more diverse needs of each group. The theoretical farming styles allow practical early decision-making in the planning process regarding the general nature (mix of styles) of the scheme development, which otherwise gets overwhelmed by diversity or is simplified to death by generalisation.

Schematic : Farming Styles as a Planning Tool



Farming Style A

The 'Business Farmer' – Commercially oriented production on consolidated larger farms

The 'Business Farmer' is an individual or a collective of individual farmers with greater commercial interest, skills, market capability and financial resources. These are the entrepreneurs, the more powerful in the community, possibly in leadership; close perhaps to the stereotypical 'emerging farmer'. They would generally **need larger farm sizes of approximately 5 to 40 ha** depending on crops grown, which would usually be those with more robust market opportunity (mix of commodity and medium value).

The one exception is where higher value crops are grown on smaller holdings (1 to 2 ha), in which case a contract arrangement is probably essential to provide the management and marketing outlets that high-value crops demand (see Volume 2 – Chapter 5 for substantiated discussion). A commercial-orientation is likely to call for higher yields and accept higher risks in the farming styles that are adopted. Land-consolidation is then clearly a key intervention as well as farm systems support with defined and budgeted marketing support initiatives. Practical implementation ideas for farming systems support include mentorships, NGO partnerships, academic partnerships or JV arrangements. These are discussed directly and expanded with short case studies in the chapters that follow.

Farming Style B

The 'Smallholder farmer' – Lower risk, diversified farming

The 'smallholder' farmer is typically a plot holder with more diversified livelihood strategies and where farming plays a smaller role in their overall income mix and livelihoods. They prefer to engage in lower risk farming styles. This approach is **not likely to be a financially feasible proposition** on many schemes with high running costs because the cash returns are reduced due to operational costs, but can (and does) survive on those schemes with low running costs – typically gravity flood schemes. Pumped systems also have a higher risk of failure which is contrary to those in poverty who prefer lower risk strategies generally.

The 'smallholder' categorisation would fit many existing farmers on schemes who are currently cropping for mixed purposes of cash sale, home consumption and for animal fodder. It is based on the argument that successful small scale farming does not have to be a scaled down version of the mainstream commercial farmer systems. Strategies in support would include **conservation agriculture and low-external input (LEISA)** approaches. Reduction of inputs and market dependency for outputs reduces external cash exchange and supports risk reduction and therefore needs to be a clear aim of the initiative supporting these farmers.

Farming Style C

The 'Equity-Labourer' – Plotholders in large scale commercial partnerships

The 'equity-labourer' is typically a collective of plotholders on large, complex or expensive irrigation schemes where the reality of scheme running costs and operational management call for commercial partners to invest and run the farming enterprise. While perhaps better suited to large complex schemes these can apply to any scheme. While there is great diversity in the details of partnership contracts, the 'equity-labourer' applies to those cases where there is in effect a wholesale handover of the soils, water and infrastructure assets **in return for some dividend and a guarantee of jobs** at the minimum wage. (Case studies of Tyhefu and Giba in Volume 2 are good examples of this).

It is important to note that many partnerships, such as contract farming or outgrower arrangements, will apply to both the 'business farmer' and the 'equity-labourer' farmer. The distinction will have a grey middle ground, but essentially can be made on the simple basis of where the authority for farming decisions is vested. A 'business farmer' maintains a level of autonomy while the 'equity labourer' is simply (and with respect) a worker.

Farming Style D

The 'Food Producer' – Intensive home food gardening

The 'food producer' is typically a plotholder who has limited access to labour and financial resources and who generally does not engage with irrigated field cropping because of the investment costs, risks and aptitude. The 'food-producer' is someone who is likely to engage in food production in a home garden – if assisted to get going. The food producer is someone at the baseline of poverty characterised by few immediate options to move beyond their current state – including the inability or **disinterest to engage in field cropping at any scale**.

Their gardens are typically a few hundred square meters. In their position of poverty they are unlikely to let go of their irrigated plot in an informal arrangement, lest they lose it as this presents one of the last few resources in their hands. The 'food producer' is important because he or she is one of the reasons for unutilised plots on schemes. In order to make the irrigated land available for those who can and want to farm it productively, there is a need for a two pronged strategy. The first is the land-registration and leasing initiative to allow the 'food-producer' to hold the land but gain some small income for leasing it. The second is a food gardening initiative in the homestead garden to give motivation to leave the irrigated plot and to provide food, thereby meeting some poverty goals.

Variation on Farming Style D

The Food Producer farming style is sometimes found on-scheme (not only in home-gardens), usually gravity schemes with low running costs. These are usually people facing real poverty. They either garden in allotted food-plots (typically the TIS schemes) or get informal permission to use unused plots on the schemes. Even though they are on the scheme, these 'food producers' use similar low-risk methods, have small garden sizes and have similar motivations given their poverty status and their focus on mixed production for home food and local sale. They present similar potential as Style D for support initiatives that aim to intensify their production and lower their risk. While they don't pose the opportunity for land-leasing initiatives because they are generally not plotholders or their food plots are very small, they present an opportunity to target poverty in a meaningful way by increasing food production for those who desperately need it. These supportive initiatives could be both on-scheme or by promoting the home-gardens as people's needs and interest show to be most appropriate.

2.7 Technical re-design for better management

The links between irrigation scheme operation, management and engineering design present an opportunity in the revitalisation initiative to make water apportionment, management and policing more equitable and with lower transaction costs. Most irrigation schemes were designed for centralised control by a managing authority (parastatal agricultural corporation for example) and not for operation by farmers themselves. The designs often make self management very difficult or heavily favour some farmers over others. A common example is where one long single main canal serves a series of small plots with increasing uncertainty and reduced water supply as one progresses to downstream farmers. (See Volume 2, Appendices – WaterCare Review for an example of this kind at Thabina scheme in Limpopo).

At its simplest level, the engineering team must not only consider rehabilitation of existing infrastructure but also think about adding new engineered components (division boxes, gates, flow meters, etc.) that will change behaviour of water use. Technology is an instrument of social change in this sense and small technical interventions can greatly reduce conflict and time spent dealing with water.

A useful first principle is that groups of approximately 20 to 30 farmers, but no more, need to form a 'hydraulic unit'. Larger numbers force a heavy organisational load which translates to excessive 'transaction costs'. This is the voluntary time used up in meetings and operations that is not directly productive in terms of the agricultural enterprise.

A hydraulic unit would be the physical point in the hydraulic system where a grouping of canals or pipelines joins a larger system. It is at this point where control must be exerted by the sub-group onto the larger scheme or vice-versa as the power struggles may be. Within the hydraulic unit the sub-group coordinates and regulates itself. This physical point could be a lei-dam, a secondary canal offtake, or a metered cut-off valve on a piped scheme.

Redesigning schemes for easier group management can be achieved by installing flow-meters in key places in pipelines, or easy to read flow-control structures in carefully selected locations in canal systems. This will have the effect of reducing the size of hydraulic units and therefore the size of the water management group that must collaborate with each other on a daily basis. Redesign may involve inclusion of new secondary and tertiary canals to offset the imbalance between top and tail-end users and make water management and apportionment easier and has potential to reduce transaction costs and water conflict.[3] Engineers are generally practical and sensible but in irrigation design this is of limited use unless they interrogate water management issues and are thoroughly informed by scheme users to develop appropriate solutions to these problems. It will amount to a case of really listening to farmers and jointly developing creative changes to the water system.

Case study

Hydraulic Units

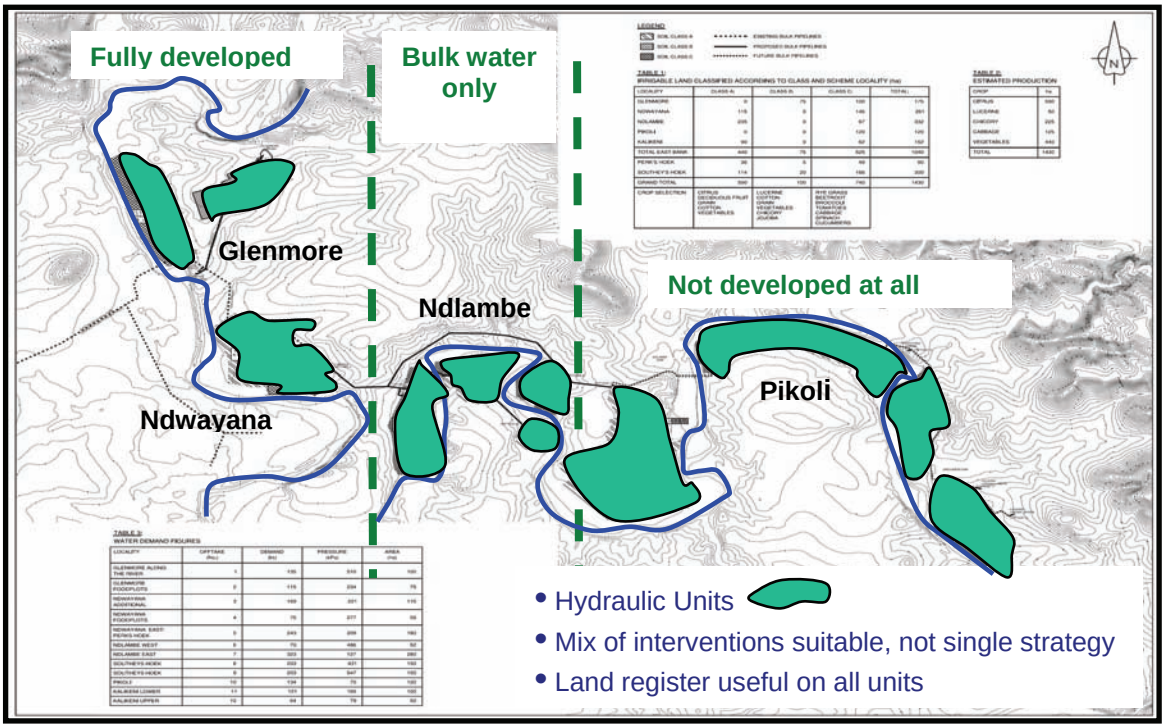
A good example of how using the concept of hydraulic units can inform the intervention approach is shown in the schematic of Tyhefu Irrigation Scheme overleaf. The different levels of infrastructure development, combined with the existing separate hydraulic units in each block present an opportunity for a wide range of flexible and varied production models. The existing hydraulic units are still large and organisationally cumbersome but present a key 'handle' around which planning considerations can be made.

Driving one uniform strategy for the whole scheme is problematic in the example case given the wide variation in the current starting point particularly in respect of existing infrastructure – part of the scheme is fully developed (Glenmore) while other parts have no bulk water at all (Pikoli). Using the concept of hydraulic units where each is treated as a semi-independent unit is one doorway to alternative creative solutions.

Glenmore and Ndwayana present opportunity for any or all farming styles (A to D) because they are fully functional irrigation systems and are fenced, although farming style B (smallholders) poses profitability challenges as the system has relatively high pumping costs. Ndlambe and Pikoli demand substantial funding investment and are therefore perhaps better suited to a commercial partnership approach of one or other kind (with investment by the partner). It is highly unlikely that farming style B of 'smallholder farmers' is possibility on either Ndlambe or Pikoli given the major investment and running costs of this part of the scheme.

[3] *More on system redesign can be found in the WRC publication by Crosby et al. (2000).*

Tyhefu Irrigation Scheme : Infrastructure development and hydraulic units



2.8 Organisational and institutional re-structuring

What's the difference between organisations and institutions? These are often used interchangeably and many people think they mean the same thing but they don't .

Institutions – the rules

Institutions are "the set of codified rules that will be enforced and the non-codified rules that will be honoured." In short, institutions are the rules of the game that bring "predictability into social interaction and produces a measure of order out of chaos" (Bromley, 1982). Similarly, Ostrom (1986) notes that institutional analysis is focussed on formal and informal rules which can be both implicit or explicit and attempt to achieve order and predictability among humans.

For something to be an institution then, it is not necessary that it be codified or even written down. One of the main aims of institutional development is to increase institutional certainty and achieve clearer enforceable rules for the irrigators. This will encourage a decision-making environment where individual irrigators can take more production and marketing risk because of the reduced uncertainties in the rules within which they are operating (Bromley, 1982). This applies equally to land-tenure, water allocations, financing, inputs, the technology of water transfer (pipes, canals, etc.) and the organisations involved in the irrigated production.

Organisations – the players

An organisation is simply a formal group of people with one or more shared goals and who organise themselves cooperatively to achieve those goals.

There are a range of organisations presently established on schemes which include Management Committees, Water User Associations, Project Steering Committees and Trusts. These organisations are the necessary starting point of engagement, but they have widely varying sets of responsibilities and historical paths to coming into existence. Many exist in name only or are one-person 'organisations'. The question is how does one move forward when faced with this range of situations? The answer, like with all things too big to deal with, is to start with manageable smaller parts of the whole – however in doing so be acutely alert to the inter-relationship of the different parts to each other.

Consider division of water and farming organisations

The primary responsibilities of the irrigation organisation will address **the water, land and infrastructure issues** on a scheme. In many instances in South Africa however, the same institution is also responsible for the **farming related activities** such as mechanisation, bulk procurement of inputs, packaging and marketing. There is a good reason to consider splitting these two distinct functions (based on Chancellor, 2003 and large scale commercial sector scheme models) so that water related functions are dealt separately from the farm operation functions.

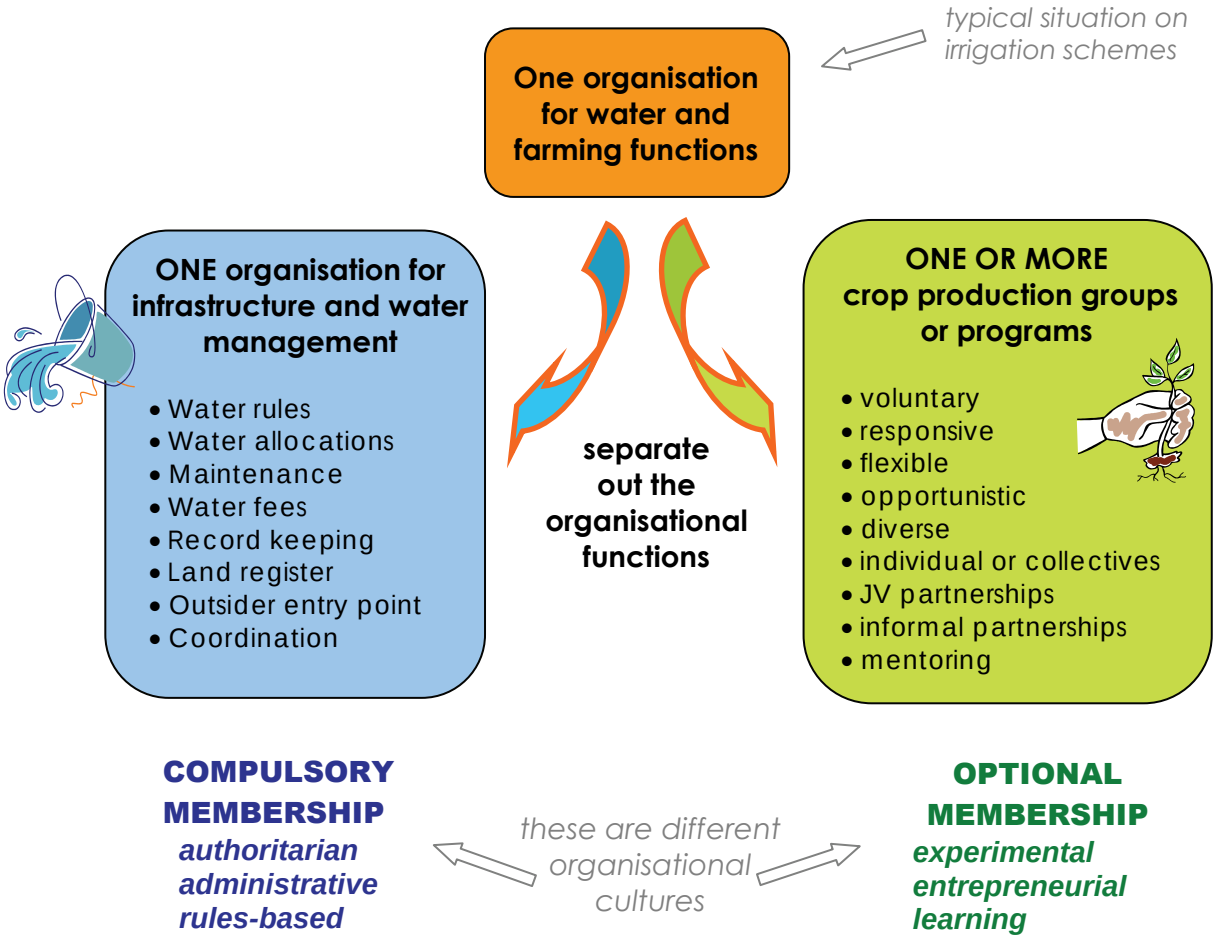
The experiences from case studies and investigation into previous revitalisation programs can be summarised by two principles (in addition to those in Chapter 1), which may be useful in guiding organisational and institutional development initiatives on schemes.

1. **Work with what is established already** unless there is good reason to change. It is potentially destabilising to arrive with a new rigid and generic organisational setup when existing systems with a history are in place. The primary organisation is the one responsible for the irrigation system operation and maintenance and where ownership of schemes has been handed over, for the fixed infrastructure itself. It does not matter what the organisation calls itself, what is important that it is representative of the correct people, and that the institutions (i.e. the roles, responsibilities and rules of operation) are clear and are mainly tied to collective water management / administration.

2. **Separate out the organisational elements** linked to farm production; make these voluntary and altogether independent from the irrigation (water) institutions. The reason is simply to create institutional flexibility and to decentralise and allow more natural organisational alliances to take place, rather than binding all farmers into a monolithic structure. The advantages and the need for institutional

freedom on the output market side is clear to see – farmers must take market advantage where it is available on their own, or in groups depending what is in their best interest. Divesting the Trust, the WUA, the Managing Committee of the responsibility for organising and coordinating mechanisation, inputs, contract agreements will bring a more dynamic set of relationships into play.

One is then left with the following divisions of organisational interest which have different modes of operation, one authoritarian by nature, the other entrepreneurial, experimental and innovative by nature as shown in the schematic below.



The separation of responsibilities by no means implies that these separate elements should not receive equal attention. To the contrary it calls for strategies to meet the needs of the Scheme Management Organisation and the farmers so that they have tangible options for input supply, production information and marketing.

These elements can be met by a diverse range of farming systems support initiatives, some examples of which are contained in the case studies and in the chapters which follow. Different groups of farmers are likely to opt for different options depending on their interest and objectives. These include direct farmer training, mentorships and a range of formal (commercial) or informal (academic / NGO) arrangements targeting the farm production system.

Institutional sustainability principles

According to Ostrom (1993) the most important question related to water resource development and management is that of **institutional design rather than engineering design**. Ostrom uses the term "crafting institutions" which indicates an ongoing process involving both irrigators and the suppliers of water. To achieve this there is a need to understand the irrigation systems themselves and how the rules of operation produce incentives and constructive outcomes (Keetelaar, 2005). This requires investment of time on the part of water-organisational members, facilitators and planners to investigate the institutional rules and see how these affect the behaviour of farmers.

Keetelar (2005) notes that Ostrom's theory can help to analyze whether the irrigation system, the institutions and the irrigators can be successful in sustaining irrigation by complying with the operational rules. This can be done by reviewing Ostrom's core "design principles" which characterise long-enduring self-organized irrigation systems and institutions throughout the world. There is strong evidence that individual farmers receive more benefits from these systems than the costs they assume for maintaining them.

The eight Ostrom principles (or evaluative criteria) for sustainable and efficient irrigation institutions are (from Ostrom, 1993):

1. Clearly defined boundaries

This is a foundation for collective action and the presence of boundaries distinguishes "common property" institutions from "open access" institutions. In addition to closing the boundaries, rules limiting use and/or mandating provision are needed whenever water scarcity is present.

2. Proportional equivalence between benefit and costs

Adding well-tailored appropriation and provision rules to boundary rules helps to account for the sustenance of irrigation systems themselves. Those who receive the highest proportion of water are also required to pay the highest proportion of the costs (fiscal equivalence).

3. Collective-choice arrangements

Individuals who directly interact with one another and with the physical world can modify their rules over time so as to better fit them to the specific characteristic of their setting; user participation in collective choice. This should enhance effective operating rules, as long as the costs of changing these rules are relatively low.

4. Monitoring

Usually, no external authority has sufficient presence to play any role in the day-to-day enforcement of rules. However, irrigators who make substantial investments in monitoring and sanctioning activities themselves, achieve compliance to rules. Monitoring can also work as a natural by-product (water rotation systems).

5. Graduated sanctions

The participants themselves, who are accountable to all users, undertake monitoring and sanctioning (active audit of physical conditions and irrigator behaviour). Individuals willingly comply to provide a collective benefit by contributing resources, as long as they are confident that others are cooperating and joint benefits are being provided. In many instances, irrigators create their own internal enforcement to:

a) deter those who are tempted to break rules and thereby

b) assure quasi-voluntary compliers that others also comply.

6. Conflict resolution mechanisms

If individuals are going to follow rules over a long period of time, some mechanisms for discussing and resolving what is or is not a rule infraction, is necessary to the continuance of rule conformance itself. In many irrigation systems, conflict resolution mechanisms are informal and those who are selected as leaders are also the ones responsible of resolving conflicts.

7. Minimal recognition of rights to organize

Many water-user groups organize in a de facto manner but are not recognized by national governments as legitimate forms of organization. Without official recognition of the right to organize, it is quite difficult to hold either user-group officials or members accountable for their actions. An effective irrigator organization lacking formal recognition may crumble rapidly when its authority to make legitimate rules for its own members is challenged and not supported by the formal government of a regime.

8. Nested enterprises

By nesting layers of organizations or the fusion or amalgamation of different levels of organization with different roles within one another, irrigators can take advantage of many different scales of organization. By utilizing more than a single scale of organization, many farmer-managed irrigation systems have sustained large-scale irrigation systems for long periods of time relying primarily on their own resources without extensive help from external agencies.

"The proportion of successful self-organized systems can be greatly increased by the investment of central governments in general institutional facilities that enhance the capabilities of those directly involved to learn new ways of governing and managing their systems, to create enforceable rules and to sanction behaviour contrary to these rules." (Ostrom, 1993).

chapter 3 revitalisation process

3.1 National and provincial policy

There are wide-ranging variations in provincial and local government policy and strategies regarding irrigation development and revitalisation. Where policy is missing, as is often the case, irrigation development is implemented with unclear and unstated objectives in terms of economic and social goals.

Where policy is in place, this is characterised by an emphasis on capital expenditure and infrastructure development (i.e. irrigation hardware and technology) and a heavily reliance on the concept of commercial partnerships for the production component. The present Limpopo (RESIS Recharge) and the Eastern Cape (Green Revolution) policies are not rooted in whole enterprise planning based on consultation with scheme participants. Given well-documented South African and international experiences in smallholder irrigation (discussed in detail in Volume 2 of the Guidelines) these may need to consider a wider range of issues and strategies in order to achieve success and sustainability.

Policy needs to apply to the widely differing technical, social and historical situations of schemes that are in need. The adoption of generic strategies (mainly infrastructure investment, or institutional re-modelling both in the hope of future partnerships) is unlikely to meet the diverse opportunities, plotholders needs and operational realities of all of the schemes in any one province. Suggestions for policy development in regard to irrigation revitalisation are made below.

Policy Question

Food vs. AgriBEE vs. economy – conflicting objectives?

Vague policy objectives such as "poverty alleviation", "empowerment", "local economic development" and "development of emerging farmers" create confusion and potential conflict at planning and implementation stages. Political objectives need to be aligned with national policy and realistic economic outcomes based on likely (not theoretical) crop production costs and returns.

Policy needs to stipulate that a process of formulating clear political objectives is an essential step which must be adopted for each scheme. The tensions between **social and economic objectives need to be resolved and not lumped together as a generic objective.** The discussion on objectives in Chapter 1 (particularly the differing objectives between politicians, planners, plotholders and farmers) must also be considered along with this discussion on policy.

food versus economy

Most schemes have potentially conflicting objectives of improved food availability with economic stimulation and job creation. The first two objectives may be better achieved through home-food production, rainwater harvesting and rainfed conservation agriculture than in irrigated production of food crops, which on many schemes is not economically justified due to operational costs and narrow margins (see Volume 2, Chapter 5).

The latter two objectives (economic impact and jobs) might be better achieved in the production of commodity crops and the post-processing thereof, or in leasing land wholesale to established commercial sector operators rather than the growing of irrigated food crops.

poverty versus regional economy

A further potential contradiction is that generating wealth for the regional economy is not necessarily going to impact poverty significantly at household level for those who live on the schemes. (see cotton production at slim or negative margins at Makuleke and Hereford cases in Volume 2 (Appendices) which supply low cost raw material to profitable cotton gins. The whole regional enterprise was profitable, but the irrigated farming venture for the communal scheme farmers was not).

emerging farmers versus AgriBEE

Driving an empowerment agenda for "emerging farmers" is a wholly different objective from driving an empowerment agenda in terms of ownership of and access to primary resources (water, infrastructure, land-resources). These come with different financial and operational implications in regard to expected rates of return and involvement of the local community. The GIBA case study in Volume 2 (Appendices) shows clearly that a bona-fide BEE company in partnership with the scheme beneficiaries provide limited (but apparently acceptable) financial benefit for the community, but with practically no opportunity for individual "emerging farmers". Thus the meeting of one objective (AgriBEE) is achieved but the model of partnership in that case excluded another objective (supporting "emerging farmers").

The point is simply that revitalisation objectives are often mutually exclusive and policy fails if it does not explicitly address this reality. If policy draws on generic objective-setting which as shown above is self-defeating, it renders the policy meaningless as a guiding document to those implementing and having to make decisions about schemes.

The detail of the objectives must be addressed for the policy to be meaningful and have practical application. Policy needs to specify that a first priority is to set clear objectives (at political, scheme leadership and beneficiary levels) that address the above tensions between political, social and economic goals. This will set a clear basis for measuring failure or success.

Policy Question

Responsible funding without feasibility planning?

Decisions to spend significant amounts of public money are in many cases in South Africa currently being made without any financial basis, business plans or feasibility evaluations. This holds true for Provincial Departments as well as District and Local Municipalities. This is in direct contradiction to the requirements of National Policies on agricultural water use.

Adherence to the National Department of Agriculture and the Department of Water Affairs and Forestry Agricultural Water Use Policy demands that operational costs are covered by those who farm on the schemes. The DWAF Options Analysis Directorate demands a minimum Internal Economic Rate of Return of 6% for investment of public funds to be justified, in accordance with national economic growth objectives. Ad-hoc funding decisions by officials within Departments using public money, which are not substantiated by feasibility studies are therefore contrary to policy and often lumped under the generic category of 'social projects'.

In order to enact National Policy and ensure responsible spending with justified financial targets, Provincial Policy needs to specify that funding will only follow substantiated feasibility evaluations. Feasibility must address both economic and social factors. Consultative processes and whole enterprise planning as set out in detail in this guideline need to underpin the feasibility process.

Policy Question

Prioritisation based on impact potential?

A rational basis for undertaking feasibility evaluations is needed as one cannot plan for all schemes at once – unless there is no budget or human resource limitations to carrying out feasibility studies (using participatory and consultative methods as detailed in this guideline). In any case, some schemes have a much better chance of success based on their natural resources, state of infrastructure, history, size and location relative to markets. Policy needs to specify that scheme selection must be based on the substantiated potential for social and/or economic returns.

This can only be achieved by a scoping process with substantiated evaluation of likely costs and benefits, multiplier effects on the local economy and relationship of the scheme to both zones of market opportunity and to poverty nodes. This scoping process can be a quick and cost effective exercise if undertaken by a small team of two or three people experienced in social, agricultural water and agricultural economic areas of specialist knowledge.

3.2 Implementation steps to revitalisation

A very simplified overview of the process that might unfold in a revitalisation process is listed out below. The timelines for the consultation and planning of such a process might be 1 to 3 months depending on scheme size. This will take the process to the point where the strategies are agreed, defined and implementation costs are established in a feasibility study (Substantial detail on a number of actual revitalisation approaches is contained in the Appendices of Volume 2) In terms of planning processes you should note the SMILE methodology, the ICON Approach (Volume 1 and 2) and some ideas from the RESIS Pre-Development Survey (Volume 2) are useful.

Participative Planning

1 to 3 months

e.g. ICON Approach

Implementation planning must embrace key roles of institutional support, conflict resolution and mentoring. Timelines for construction are short but budgeted involvement needs to extend beyond 3 years, preferably 5 years as a minimum. There is strong evidence from the case studies as well as other research work (notably Chancellor, 2003) that timelines of involvement need to extend to 8 to 10 years to have a real chance of sustainability. As time progresses the role of the implementing agents will shift from being central to meetings and processes to that of an external advisor mainly dealing with conflict resolution, institutional support and advice.

Long implementation timelines

Think 5 to 8 years of support

The case studies (Ezemvelo, Makuleke, Tyhefu and Noko) all show very clearly that there is an important, if not crucial role for a 'neutral' party to address institutional building, contract brokering and conflict resolution between scheme participants and the contract parties. This could be an NGO, an experienced rural development consultant group or an academic institution with a rural development interest.

Neutral 'agent' central to process

Institution building and conflict resolution

The nature of academic partnerships and NGO relationships means that they tend to follow a more open-ended process, working perhaps on smaller elements and taking development forward in an ad-hoc way. This is different from the broad masterplan approach suggested by the above process, but is no less valid. The mode, timelines and scope of interaction are largely determined by how much funding and time is available for the process.

Revitalisation Stage 1

Scoping of institutions and scheme status

1. Form a small but influential **project lead team** with the Department of Agriculture, Department of Water Affairs and Forestry and District Municipalities with appropriate agricultural and engineering advisors if need be. Cooperation at departmental and district level is centrally important, as this is where the money will come from, where objectives need to be defined and where decisions are made. This group must be small, dedicated and each representative must have executive power to consider and make decisions on political and financial ways forward. Typically this team would include Senior Managers and Department Directors. Attendance by delegated juniors is likely to prove pointless and will simply frustrate the process.

2. The **project management** demands of a coordinated programme for revitalisation of many schemes at once are substantial and the programmatic dimension is not addressed here. Larger schemes (bigger than a few hundred hectares) are likely to require a financed 'development agency' to drive the coordination and planning processes through both government and outsourced service providers. What is important when attempting revitalisation at any scale, is that generic solutions and broad-brush application of plans across different schemes (or even on a single scheme) must be avoided. Each scheme must be dealt with as a unique situation and very scheme specific solutions generated. The unique combination of agro-climatic, socio-economic, local politics, market possibilities, farmer mix, scheme technology and history make this essential. Rather do less but do it properly. Spending money on irrigation is very easy. History (recent and more distant) shows clearly that getting returns on investment is not.

3. Visit the scheme(s) with an **experienced sociologist and an irrigation development planner**. The sociologist must be completely fluent in the local language to explore land tenure issues (see Chapter 5) and existing institutional arrangements on the schemes. Document institutional arrangements and issues on each scheme and explore levels of representation of scheme participants. There is little point going further with planning until existing representation and institutional structures are understood by the team. **Consider options for organisational restructuring.** Participative planning or even shortcut approaches like top-down implementation (not recommended) of commercial partnerships needs clarity on roles and relationships of organisations. The ICON approach (in Volume 1) has a useful brief checklist for a one-day visit that allows a fatal flaw assessment to be made and this leads one to the most immediate issues of concern. There is little point going further until a qualitative assessment suggests more effort is warranted.

4. Explore **objectives and desired outcomes** of the relevant authorities (provincial and municipal) who exercise control over resources, as well as the scheme leadership. This will allow the planned interventions to be based on a clear understanding of the desired objectives of scheme. It will assist in resolving the possibly differing perspectives of Departmental, District Municipality and Scheme Leadership about what the scheme is likely to achieve.

Revitalisation Stage 2

Participative planning – feasibility

1. Engage in a **community mobilisation and information** gathering exercise at farmer level using the approaches, or a mix of them as detailed in this Volume 1, Chapter 6. The ICON approach developed as part of this assignment is one cost-efficient method for detailed participative planning in the context of feasibility evaluations. This work is usually tendered to multi-disciplinary teams. It is therefore important that the terms of reference call for familiarity with participative irrigation planning methods such as in this guide and other WRC documents (Crosby et al., 2000).

2. A **diagnosis tool** is particularly useful for schemes which have some ongoing crop production as it gives farmers feedback on their production mix, costs and through scenario planning informs choices. In any case enterprise budgeting of various scenarios is an important (and conventional) evaluation and planning step. Two of the tools that are discussed in Chapter 4 expressly include participation in the detailed diagnosis and enterprise budgeting. Although a number of approaches may be used, the principle of participation must be central. The recommended approaches are SMILE (detailed diagnosis and planning tool for active farmers) and ICON (a more rapid diagnosis and feasibility study approach for both active and future scenarios).

3. The aim is to **understand the current reality** on the schemes in terms of the key elements of agricultural production from the perspective of those who currently have rights to the land (i.e. the 'plotholders' and the 'farmers' – see Chapter 1). This requires a substantial mobilisation and consultation process right down to sub-scheme and groups of households. If you are using the ICON approach, then the intensive series of meetings between locals and the team will have arrived at outline project plans which, based on experience of the team, are likely to be agriculturally and financially feasible.

4. Consolidate and **reflect information** to the task team, scheme leadership and farmers; this would include plotholder's skills and livelihoods, plotholders' relationship with agriculture, historical experiences on the schemes, links to their land, needs, desires; all of this in the context of the reality of the agricultural and water resources, and existing infrastructure.

5. Reflect the general vision of how the different farmers (some or all of the Four Farming Styles A, B, C and D) might progress and make sure that this is agreed by scheme leadership, plotholders and farmers. Make sure that the consequences ie. leasing of land, commercial agri-business partnerships, farmer training and support for household food production, including irrigation infrastructure and water harvesting, are appreciated.

Revitalisation Stage 3

Implementation of intervention plan

Implementation is dependent on the detail of the plan so it is somewhat arbitrary to select elements in series as many will happen concurrently or in a different order from what is presented here. However, the implementation plan is likely to include some elements linked to the following factors (full case details of how revitalisation initiatives have evolved over time and the sequence of activities can be found in the case studies presented in detail in Volume 2, Appendices):

1. Finalise the **quasi-legal land process** of formalising existing land-allocation and land rights (detail in Chapter 5). Draft and explain pro-forma lease agreements, ratified by the Traditional Authority.

2. Promote **food production on the homestead gardens**, tank building, water harvesting in parallel to the above step. This work must be process based, be highly motivational and address the root of the powerlessness of poverty. Methods and approaches such as those of the Water for Food Movement and the NGO Abalimi Bezekaya are particularly useful and are expanded on in Chapter 6.

3. Define **marketing channels, sources of finance and cash flow** measures. These are highly project specific variables and are fluid over time on any one scheme but must be nailed down and clear for the short term. The very specialised nature of these tasks calls for support in the form of supportive relationships either from Government (ideally an active extension relationship), or NGO advisors, academic institutions or commercial partnerships of one or other form. Supportive relationships can also be forged between successful and new farmers on the scheme through farmer to farmer initiatives.

4. Finalise **engineering rehabilitation and re-design** to allow easier water management and allocation. Schemes built for centralised management and water control will in many cases need to be re-designed to allow better farmer management. Typically this means isolation to smaller hydraulic units which facilitate easier coordination of smaller groups of farmers (typically 30) for example (see Volume 2 – WaterCare Review for an example of a re-design opportunity at Thabina scheme in Limpopo).

5. Initiate the **training programmes for 'smallholder farmers'** who wish to proceed along a path of commercialisation, complete with financial mechanisms and exploration of marketing / entrepreneurial initiatives. There are a number of options for training, including mentorships (such as used in the Noko case) or research relationships (such as used by the Ezemvelo case). Similarly, arrangements can be made with organisations such as the Agricultural Research Council who have credible and progressively thinking crop production experts. Training is best carried out on the locality – rather than taking farmers away to another place.

6. Identify the needs for **on-farm record-keeping** that is appropriate to the skills level and the financial commitment of the farming or food production enterprise. Typically, partnerships, Joint Ventures and outgrower relationships incorporate record-keeping into the support package that is negotiated, but the detail and content must be legible and meaningful to farmers. Computer printouts of loan amounts for input supplies (fertiliser, seed, ploughing, etc.) and tonnage and Rand value of crops delivered to packing houses are often not meaningful to farmers and require alternative formatting or workshopping to have meaning. For smallholder farmers, manual record-keeping may be more appropriate.

7. If **commercial partnerships** are real options it is likely that these would have been initiated at the planning stage – at least tentatively. The role of a commercial partner or of other partners (Government, NGO or academic) in the key areas of input finance, crop production knowledge needs to be more defined and contracted. These are also expanded on in Chapter 6 with substantial detail on the range of academic, NGO and commercial partnership types presented in Volume 2.

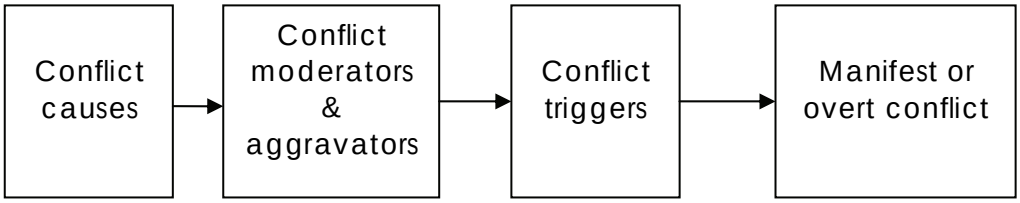
8. Set out the **monitoring and evaluation baseline and parameters** so that progress and perceptions of the intervention can be measured further down the timeline. Monitoring can be a mix of external monitoring and self-monitoring to provide both outside and local perspectives on revitalisation impact on peoples' lives.

3.3 Dealing with conflict

When conflict arises at any stage of the process it is important to understand its various elements, sources, the factors that fuel and those that trigger as well as the manifestations of the conflict. The history, duration and the extent of conflict will demand different strategies for each case, but some suggestions to these often intimidating challenges can be addressed are offered below.

The sources of conflict could be factors internal to the community, or factors that are external or a combination of the two. It is useful to consider the conflict path as shown below.

The conflict path:



While the approaches adopted by various facilitators will vary, in situations of serious conflict it is important that this role is played by a facilitator who is perceived as a neutral agent, without vested interest in the outcome other than resolution of the conflict itself. While some of the development or government agencies involved with the particular communities may have some ability to facilitate conflict resolution, it is always advisable that this role is played by a party that is not in any way connected to or involved in the conflict.

Case study

Wrong Way: *The Tyhefu case in Volume 2 – Appendices, shows how things can go wrong when conflict resolution is attempted in a hurry by someone not well equipped for the task. A well-intentioned senior government official was not well placed or skilled to play the role and this resulted in greater tensions and polarisation.*

Right Way: *Examples of the important constructive role of very different (but neutrally perceived) conflict resolution facilitators are presented in the Noko and Ezemvelo case studies in Volume 2 – Appendices. At Noko a former Government official continues to play a key role while at Ezemvelo it is a trusted academic who facilitates*

Neutrality and distance from the issues is particularly important in cases where the conflict is deep rooted and has been in existence for some time. From the beginning of the process it is important to ensure that the approaches that the facilitator adopts show ability to listen to both sides of the story and be guided by principles of fairness.

While the facilitator may use various strategies to diagnose the causes and consequences of conflict it is always important that the process which is designed opens up opportunities for the conflicting parties to be fully involved in resolution.

There are costs and benefits to different negotiations styles, which ultimately inform both the process and the outcome. The underlying approach of each party involved in the conflict is an important consideration and can present windows of opportunity for resolution. These may range from a soft negotiation approach, to a joint problem solving approach and even direct forcing or controlling strategies.

Some of the strategies which can be either used in isolation or in combination include:

- Joint problem solving,
- Negotiation,
- Facilitation,
- Mediation,
- Mediation-arbitration,
- Arbitration, and
- Litigation.

Factors to consider in deciding on your approach would need to include:

- What are the underlying causes of the conflict?
- What are the symptoms of the conflict?
- What interests are the parties trying to serve and how will this affect their choices for resolving the conflict?
- How much power do the parties have?
- What resources are needed and are they accessible?
- How much money is available to spend?
- What is the nature of the relationship?
- How will any decision affect the relationship with other parties in the short and long term?
- What are the chances of the conflict re-occurring?
- Will the process address underlying causes or just the symptoms?

It is often partly the source of perceived of power that informs their different stances. The facilitator needs to understand the sources of power on which positions are based. It is important to remember that power can be used constructively or destructively and that sources of power do not usually exist in isolation, but are often combined. These might include:

- principles/moral power
- communication power
- skills power
- control over resources
- formal authority
- coercive power
- political power
- contractual power

Poor conflict facilitators often make the following mistakes:

- Poor listening
- Poor use of questions
- Badly handled disclosure of information
- Poor presentation of issues
- Confusing negotiation with debate
- Overreacting due to stress
- Rejecting alternatives
- Misuse of team members

Good and sustainable agreements are characterised by the following;

- Meet parties' interests to the greatest possible extent
- Durability
- Not damaging to the relationship between parties
- Are ratified by respective parties
- Unambiguous and complete, including all items agreed an indication of items not agreed will be dealt with
- They promote the use of the negotiation process

Unlike day to day conflict in either our work or home environments, most conflicts in projects require skilful manipulation and control. By failing to respond to the signs of conflict, which are often not that obvious, or by handling a conflict situation poorly progress can be abruptly stopped and often completely reversed. For a facilitator to be equipped to manage conflict, it is critical that they have a deep understanding of the range of factors outlined above and that their neutrality is uncompromised as perceived by all parties.

3.4 Scheme management organisations

Start with existing organisations

All interventions on a revitalisation initiative need to acknowledge and start with the existing informal organisations (Project Steering Committees) and legal entities that are currently established (Scheme Trusts, Co-ops, Water User Associations, etc.). You are likely to be one of many who have passed through the doors with enthusiasm and new ideas – most of which the leadership and farmers will have seen no outcome.

Case study

Raised expectations and new recommendations

At Zanyokwe Irrigation Scheme, a feasibility planning team in 2004 was the 7th group of 'outsiders' to engage with the farmers since 1998. The farmers had seen practically no positive benefit from any of the processes. Ironically, even though a strong recommendation was made for revitalisation funding in the most recent case, no project has been implemented there, so that intervention simply compounded the pattern of raised expectations and subsequent disappointment. These precedents of raised and disappointed expectations, or worse failure and broken promises is an unfortunate fact but is the likely starting point for your interaction with the people on the scheme. You are potentially another of the same until you prove differently – and building trust takes time and responsible process ….

A process must take place to respectfully engage with existing leadership to the level that is justified by the size (and funding) of your intervention. In any case an attitude to support and cooperatively build organisations as well as define the rules by which they must operate (i.e. the institutional component) is of great importance.

There are however, organisational stumbling blocks that can create a high-risk environment for engagement with the people on the schemes if these are not identified and addressed at the very start of the engagement. Your team must have astute first-language (local language) social scientists with strong interpersonal abilities and have political suss – or you are very likely to get lost early on. The many complex undercurrents must be brought to light.

These high-risk factors relate mainly to local politics or simply organisational collapse on schemes which are no longer operational, or in many cases are linked to the overlapping boundaries of civil and tribal authorities. The experiences in the box below documented at three schemes illustrate this point.

Case study

Three Cases of Institutional Failure

Case 1: *"The Qamata and Gcaleka Trust are in strong disagreement about a number of issues, including representation. While the official point of engagement for outside agents is legally clear (ie. the Qamata Trust), no intervention is likely to succeed until the substantial tensions between the two trusts are resolved. This will probably only be achieved through high-level conflict resolution intervention, which will then allow any further discussion about scheme evolution to commence." (ARCUSGIBB, 2004)*

Case 2: *At Tyhefu in the Eastern Cape, a democratically elected 'Project Steering Committee' agrees, after extensive discussions and processes, in a mass meeting to engage in a commercial partnership with a major company. Two years later, after a drawn-out tender process, land access under one of the Tribal Authorities became the underlying cause of conflict the Project Steering Committee on choice of a commercial partner. The lack of formally constituted and agreed representative structures with proactive conflict resolution support scuttled the process. (see Tyhefu Case Study – Volume 2)*

Case 3: *An example of failure through poor representation is Boschkloof irrigation Scheme on the Steelpoort River in the Sekhukhune District (Limpopo). A thorough (and expensive) facilitation process over a period of two years proved completely unsuccessful with the scheme reverting to its old state of dysfunction because the Management Committee was constituted of leadership that was not respected or considered representative by the scheme plotholders and farmers. (see Makuleke Case Study – Volume 1.*

The typical scheme management organisation on South African smallholder schemes is a Trust established in the mid or late 1990s when a decision was taken to 'hand-over' the irrigation schemes to the 'community' or a Management Committee constituted during one or other revitalisation initiative. On some schemes there is no separation between the Water User Association and the Trust (e.g. Qamata which has the same members on the two separate legal structures) and this is inappropriate. The scope of activities of a Water User Association and the membership is far broader and includes all water users, domestic, on-scheme agricultural, off-scheme agricultural and industrial.

Responsibilities of scheme management

The scheme management organisation needs to be responsible for water, infrastructure and administration issues pertaining to the scheme. The functions of water management should be separated from the farm production elements as discussed in Chapter 2. The water and infrastructural responsibilities of a scheme management organisation include the following:

Technical and Water supply

- Ensure irrigation water needs of the farmers are met
- Engage with and advice all technical teams working on the scheme
- React to technical reports

Institutional

- Functioning of committee
- Establish disciplinary procedures (and implement strictly)
- Problem solving and guidance on water allocation and conflict
- Link with outside structures including Tribal Authorities and District Municipalities
- Land issues (land registers, land tenure, land allocation, leasing)
- Authorise implementation of development programmes
- Regular progress reports to farmers

Financial and Administration

- Setting and collecting of farmer's levies
- Link up with other water users
- Accountability – preparing and controlling budgets
- Generation and raising of development funds (Non-government Organisations, donors, credit)
- Financial control (bookkeeping at all levels)
- Administration control (record keeping at all levels)
- Approve payments and tariffs to contractors

The managerial and financial responsibilities of a Scheme Management Institution are substantial, particularly on larger schemes with high running costs and where regular payments must be made. At the planning and consultation stage it is not necessary or appropriate to engage in immediate restructuring of organisational structures and the rules by which they operate. The organisational form and the underpinning institutions can only be developed as part of the larger development plan.

Simple technical decisions for example, impact directly on the level of organisation, and the rules by which these components must operate. A collective agreement to lease large blocks of land to a commercial partner would require a wholly different organisational structure and set of rules, than would apply to many plotholders farming independently. Routine implementation of standard organisational structures parachuted into schemes is likely to prove irrelevant and a waste of plotholders and scheme leadership time.

The iterative and ongoing nature of institution building, or 'crafting' as termed by Ostrom (1993), needs to be responsive to the particularities of the scheme infrastructure and the broader development plan. Ostrom's 'actor' and 'action arena' are particularly useful concepts that should be brought to bear and institutional specialists would do well to research and apply these.

Well developed but yet unpublished training modules for task-specific training of scheme management personnel have been developed by WOMIWU Rural Development based in Polokwane. It is expected that these will published in the future and would be an important resource to add to a revitalisation programme design.

3.5 Success and failure factors

There are many lessons that can be learned from review of successful and failed schemes in South Africa and abroad. A list of success and failure factors that provide context and depth to how irrigation revitalisation planning can proceed is summarised below. The derivation of the success and failure factors is presented in some detail in Volume 2 (Chapter 3 and Appendix D).

success factors

Whole scheme and farm system plans
Experience is clear that **infrastructure development alone or as a dominant part of the intervention is highly unlikely to succeed**. Farmers in smallholder schemes need support systems that go far beyond just the irrigation system if they are to improve their livelihoods significantly. Narrow sectorally isolated engineering and infrastructure driven programmes have substantially increased risk of failure.
The interventions which are based on **comprehensive strategies** addressing the **complex of activities** that make up the irrigation enterprise are most likely to succeed. These include markets, finance, inputs, infrastructure, institution-building and crop-production information.
Those projects which have paid **equal attention to the infrastructure** (hard components) as well as the **social and institutional systems** (soft components) of water user organisation and agricultural production are excellent models of intervention with higher success rates (Neeraj et al., 1998). South African experience shows this to be close to a 50/50 split with intensive support initially and extended support over timelines of 3 to 5 years. Failure to invest a large portion of the budget in the social and institutional components is unjustified given the weight of experience at hand.

success factors

Whole scheme and farm system plans
Access to reliable water is an essential, though not sufficient condition for sustainable improvement in irrigated agriculture. Productive use depends on irrigation technology but **will only be successful when market development and information supply to farmers** are made a core priority in the overall intervention design (Merrey et al., 2003, paraphrased).
Insecure land tenure and the related issue of **irrigation holding size** need to be addressed. Most successful irrigation farmers derive a major portion of their income from irrigated farming (i.e. not part-time farmers). Full-time farming is an incentive to engage in management and operation of the scheme. Farmers who work small plots are forced to pursue a number of income and livelihood behaviours of which irrigation may be a small part and therefore, with a negative impact on commitment and interest. Insecure tenure limits incentive to make investments and provides no room for a land-leasing market.

success factors

Planning considerations and livelihoods
The total project cost in revitalisation relating to the infrastructure component must only be 50% to 60% of the total project cost. The **costs attributed to human capital development** (farmer training, institution building, negotiation skills development, marketing support, mentoring, planning, etc.) must be a major budget item amounting to 40% to 50% of the total budget for success.
Planners must **adopt realistic yield projections;** pricing structures must be based on smallholder realities of production and marketing so that the resultant financial evaluations on which investment decisions are based are realistic. Engineers and economists need to temper undue project optimism with the socio-economic and agricultural production realities. The impact of isolated sites, difficult communication, and poor supporting infrastructure, will result in lower production than average commercial sector scenarios.
The **economic and financial cost** of sustainable self-management must be an **acceptably small** proportion of improved income and the proposed organisation design must have **low transaction costs** (Shah et al., 2002).
The intervention process in general must hold out the **promise of a significant net improvement in life situations** for a significant proportion of members and the irrigation system must be the central resource to creating an improvement in farmers' life situations (Shah et al., 2002).

success factors

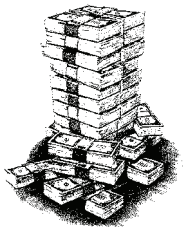
Planning considerations and livelihoods
Participation, ownership and appreciation of diversity at scheme level need to be integrated with **livelihoods strategies outside of the irrigated context**. This means taking account of multiple water needs for personal uses, livestock, fishing, laundry and other small businesses using water in addition to irrigation.
Irrigation-related interventions need to be made with full appreciation of the **broader river basin requirements and regional water allocation demands**. Participation at local level is likely in most cases to be subdued by the powerful and vested interests linked to water allocation at catchment / basin level (Merrey et al., 2003) and this disempowering reality must be consciously addressed and mitigated against in both the process and the institutional design. The water allocation reform process now underway nationally will be significant in the smallholder irrigation context.

success factors

Participation and ownership
The approaches cannot rely on vague or routine use of PRA methodologies but have to ensure meaningful transfer of information rooted in time-consuming and expensive processes, leading to fully informed decision-making on the part of participant farmers. **Ownership is rooted in the information transfer and decision-making process**.
It is useful and important to learn from and **build on pre-existing institutions** and practices for managing the irrigation systems. New institutions demand additional time and cost to operate and alter or undermine delicate local power balances for decision-making and access to limited resources.
Ensuring **ownership of new and rehabilitated infrastructure** through central involvement of farmers in all aspects of decision-making is critical. In general, the overall performance of interventions in irrigation systems in a **demand-driven mode, with a high level of farmers' involvement** in irrigation projects, has been better than those provided with support in a supply-driven mode with moderate or low levels of farmer participation (Neeraj et al., 1998 in a detailed IMT study of a wide range of intervention approaches on 231 schemes in Nepal).

3.6 Spending targets and implementation

A flood of money



Several factors in combination have lead to new availability of funds for irrigation development in South Africa. Globally the past five years have seen endorsement of the Millennium Development Goals by 187 countries and major attempts by international figures to place African poverty back on the world agenda. African Renaissance thinking leading to the development of NEPAD and the African Union Maputo Declaration has resulted in member states pledging to commit 10% of their national budgets to agriculture. In addition, South Africa's positive economic performance has made money available, while pressure is mounting to address the poverty and unemployment in the country, particularly the rural areas.

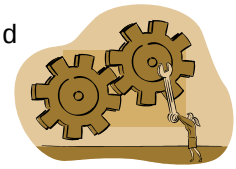
Agriculture Departments are facing a new challenge where previously overstretched staff working with tight budgets must now formulate plans and spend money in the billions on agricultural water – which is usually inappropriately interpreted by those responsible in the narrow definition of irrigation (and worse, often only irrigation technology), rather than agricultural water use more broadly. The emphasis then tends to shift to major capital expenditure budgets as there is pressure at political and administrative levels in the provinces to deliver.

One of the key short term measurements of delivery is ability to spend the allocated budget with political risk when spending does not meet allocated targets. A flood of funding should sound like really good news for resource poor farmers and communities. In practice, the result seems to be an expenditure plan that does not uphold development principles and does not measure its goals or success through broader balanced scorecards which could include, for example:

- economic viability based on sound business plans
- level of participation and ownership by beneficiaries
- sustainability of initiatives
- identifying poverty initiatives (food production) separately from irrigation which tends towards more macro-economic benefits as discussed in Volume 2, Chapter 5.

The current RESIS programme has major expenditure targets (R1.08 billion over 5 years) and the Eastern Cape has allocated R100 million for the 2006-07 financial year. Under-spending is a perennial challenge in the provinces and full expenditure is difficult to achieve with the existing capacity of the departmental bureaucracies to plan and implement quickly enough.

Limited capacity to plan and implement



Planning timelines for major irrigation projects using responsible and participative approaches are between 1 and 3 months. Contract formulation, design of training programmes and procurement of institution building and farmer training service providers to undertake work is another 3 months. Implementation timelines need to extend up to 5 years. The number of projects that need attention at the same time in order to meet expenditure targets is significant. On the RESIS programme, the initial implementation plan expected simultaneous construction and consulting activities on 124 schemes over the middle years of the programme. The project management requirements are a challenge even for the most well equipped of commercial sector organisations. The demands far outweigh available capacity if process oriented development principles are to be adhered to. The review of the RESIS programme in Volume 2, Appendix C, noted a capacity deficit well beyond what was needed to spend in any other way than a full scale capital intensive approach, with loss of the necessary engagement of people to be involved in uncertain timelines of participatory planning. The two simply do not work well together, unless a long term and slower up-scaling of activities and building of implementation capacity is undertaken, both within Government and in private sector.

In the Eastern Cape, there are only two or three consultancies with the necessary experience in participative planning work in the irrigation sector, similarly in Limpopo and KZN. However there are numerous competent engineering and irrigation equipment supply companies. There is little option when driven by expenditure targets to go the route of mega-projects focussed on the infrastructure and to avoid a balanced score-card approach with all the complexity (institutional development, farmer support systems, etc.) that this broader approach implies.

A longer term development path, building realistic capacity on the strengths of government and the private sector, is the only other option as difficult as this may be to achieve. This is demonstrated by a case study of procurement, which has been left unnamed but is current. The purpose is to illustrate the problems of expenditure-driven programming and draw attention to factors that are likely to impact on the ideas and strategies suggested by this guideline.

Procurement case study

This is a real case documented by a development fieldworker over the period from late 2004 to March 2006. The purpose of presenting the case is to highlight the gap between the lofty ideas of theoretical planning, the realities of implementation and the destructive impact on farmers and plotholders so-called development initiatives are still having in South Africa today.

Case study

Procurement Systems Undermine Development Process

They are an isolated community, up in the foothills. They are so isolated that they are begging for information about AIDS, because 'we don't know what this thing is, we just see our young people are dying every week.' No awareness campaigns have reached them, they have no cellphones, telephones, or TV coverage, and taxis seldom reach here. They have a flood irrigation system fed by gravity flow out of the mountain streams and their abstractions have little downstream impact. When conditions or cashflow is a problem they down-scale their production or don't plant, letting the water run unhindered downstream. Some years they suffer, but they have no debts from scheme operation or from loans.

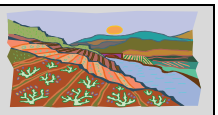
The Government implemented a major plan with a major budget to upgrade their irrigation scheme. There is now a ban on flood irrigation, so their system will be converted to a pumped system to 'save' water. This means they would have to produce every year with a cash component and make sure that they earn enough to be able to pay the electricity bill. They could no longer opt not to plant during any season for other reasons, because they would still be liable for the monthly electricity line rental costs, whether they use electricity or not. The problem of unpaid electricity bills on schemes in every province is well-known and is a perennial problem for departments. Water savings equal to sprinkler systems could have been implemented using short furrow irrigation technology with minimal capital cost element and a small training cost component.

Irrigation infrastructure is a scarce national asset, so more livelihoods oriented production with mixed cropping for home use, animal fodder and cash sale as has been their practice was said to be unacceptable. Therefore, theoretical market contracts would be negotiated and they would be taught to grow high value crops so that they could buy all the food they need. This is a similar strategy to the 1950s ideas with Malawi's Master Farmer scheme, the 1970s idea with Keiskammahoek Dairy, the 1980s idea with cotton production at Arabie Olifants and food crops at Tyhefu scheme, the 1990s' idea with banana production at Homu Irrigation scheme.

Every one of those schemes is dysfunctional or derelict today. Every one of them have taken farmers' control over production out of their hands by 'upgrading' the irrigation infrastructure to modern systems, aiming to enhance water use efficiency, improve productivity, and inculcate market-oriented farming. In a word: to make 'proper farmers' out of rural people. The community is largely unaware of this history, so they face the prospect of a grand new irrigation scheme with expectations of wealth and prosperity. Those who have used the scheme to sustain their livelihoods for many decades have not had a chance to consider and assess the pros and cons of different options, with full information on the good and bad histories of other comparable cases. Ultimately, it is these people who will decide what the scheme will look like in future and how it will be utilized.

As the end of the financial year approached financial pressure to spend money increased. There was not enough time to replace the irrigation system before year-end, so the focus shifted to easy infrastructure upgrading, which included fencing, canal cleaning and roads. Fencing in particular provided a good opportunity to get money spent and employ lots of local labour, without affecting future decision-making on the nature of the scheme. Fencing material is also easy to get because there is an approved exemption in place – fencing material can be bought on the basis of three quotations up to R2m per purchase, thus eliminating the need to go through a lengthy tender process.

A departmental instruction was issued to 'buy in bulk' to save money. Contractors would not be allowed to purchase material on behalf of government, because then they were entitled to a mark-up, resulting in more costs to government, but implementation in practice created major obstacles.



Material was not truly purchased in bulk and then drawn down against detailed quantities lists over time. The procurement system demanded that detailed quantities had to be determined for the first batch of schemes to make up a sizeable order worthy of bulk buying. Every strand of wire, every steel dropper and corner post had to be specified for all 10 schemes under pressure as the year-end was approaching. Weeks later, just at the point of final approval, there was a query about one of the ten schemes which had received some fencing the previous year and could possibly not qualify for fencing again. On closer inspection this turned out to be a misunderstanding as the fencing material requested was to complete parts not covered by the previous assistance.

In the meantime, the entire requisition was turned down and the process had to be repeated, so Community A's fencing material was delayed along with all the rest. Information was supplied that sufficient quantities of fencing material were already available in a nearby departmental store. This was physically checked and verified and it seemed Community A were going to get the fencing. However, when arrangements were made to collect the material, it was not released for use by Community A, because the material was allocated only for use in a neighbouring district. The disappointment and frustration of lack of delivery compared with promises and raised expectations started to mount in the community.

The procurement of labour posed its own challenges. Facilitators and district staff got active in putting together and providing training for community members on the correct way to set out and put up fences using local labour. However, all of anticipated community benefits of 'getting the contract' to do the fencing were shattered. They were informed that only registered companies were allowed to be appointed on government contracts. On another scheme, even the cleaning and repainting of valves had to be channelled through a commercial company to create a mechanism for farmers to get paid for repainting the valves on their own scheme. People within the Department and those working with the Department could find no way through the procurement process to implement sensibly.

To avoid the delays involved in the tendering process, an agreement between relevant departments had been established, enabling the use of 'Term Contractors' who had already been appointed through a fair tendering process and assigned to the District, to act as the legal entity through which Community A could offer its labour for the work to be done on upgrading their fencing. Contracts were put in place, community negotiations completed on who would be employed, and the work could start. First, the existing fencing was removed and then a strip was cleared for the erection of the new fence. The fencing material should have been there already, but no-one was overly concerned, because it would arrive any day. Finally, rumour had it that the purchase had taken place and that their material had already been delivered to departmental stores in the regions already. Then the bad news came: only some of the material was there, some components (thought to be the steel droppers) were not available yet, but no-one knew the reason.

The financial year-end passed and now a second year-end has passed but there is still no fence. In the meantime, farmers have been unable to plant and have insisted that the department should return and put back their old fence to enable them to grow their crops as they did before the promise of money and a new scheme came.

The woman living in the village who acted as the link person between her community and the department is suffering unbearable abuse. Her quality of life has worsened as the community holds her responsible for the situation they find themselves in. In February 2006 she begged an outsider for a place to stay in town just for one week so that she can escape her damaged social situation at home.

Some of the implications on project planning that is driven by the need to meet expenditure targets, and of implementation through government procurement systems and all of the challenges this poses, are highlighted by this case study. The generic nature of interventions and refusal to recognise the value of people's current production approaches using a flood irrigation system, was the first in a series of near-tragic consequences.

Every system from high-tech drip through to efficient short furrows has an appropriate application and should be considered according to site specific needs, opportunity and returns for investment. Broad brush interventions that present rules for technical, institutional or crop production approaches, as the success and failure factors and this case study so clearly indicate, are likely to fail. Some may argue that this is not failure, or it is part of a necessary development process and that results will yet be achieved. It is evident that the reported experience of the plotholders is one of disappointment, resentment and failure.

While success is not guaranteed with any approach, adoption of the principles of engagement and awareness of the success and failure factors could only have arrived at a different outcome in this case. This outcome may not have complied with the high expenditure targets, which is a tension that a major programme would need to reconcile responsibly at a political level.

chapter 4 feasibility planning

4.1 Feasibility planning tools

There are a number of approaches and tools that may be useful in carrying out irrigation feasibility studies in addition to conventionally applied practice. The feasibility planning process comprises in its shortest form:

a) a resource evaluation,
b) consultative planning of a range of agricultural enterprises and support interventions,
c) a cost-benefit analysis of options leading to justified pathways to change.

The tools that are discussed address the latter two points (b and c) as it is assumed that planners undertaking the feasibility studies are well-versed with conventional resource assessments (soils, water, infrastructure, etc.) which are covered in numerous other texts. The contents of this chapter therefore augment conventional practice, rather than replacing them and include discussion and applicability of:

- SMILE (Sustainable Management of Irrigation Lands and the Environment)
- The Small Scale Irrigation Planning and Design Manual
- The Iterative Consultative Planning Approach (ICON).

The Chapter concludes with an explanation of the contents of a feasibility report:

- First the content and terminology of the financial evaluation and
- Secondly a comprehensive table of contents that a feasibility study should contain to properly inform decision-makers funding allocations.

4.2 Tools: SMILE – Sustainable Management of Irrigation Lands and the Environment

This description of the SMILE methodology is paraphrased from the SMILE publication by Perret and Touchain (2002).

SMILE requires intensive data collection on farming practices to develop the suite of farmer typologies that is the basis of the methodology. Primary data collection and feedback to farmers demands somewhat greater time and costs and is well-suited to action-research approaches with longer timelines than shorter feasibility studies. The software itself is still a powerful tool for generating theoretical enterprise budgets and can therefore be used as the agricultural-economics evaluation tool, although this is not its primary strength or purpose.

In South Africa, it is very difficult for decision-makers and operators to evaluate the potential for long-term sustainability, then to organise rehabilitation and transfer of assets. There is a context of low participation, weak local institutions, and lack of information regarding farmers' strategies, land tenure arrangements, cropping systems, household socio-economics, and so on, which eventually determine the potential for cost recovery and economic viability.

The SMILE methodology developed by CIRAD and the University of Pretoria is an action research approach in three steps designed to address these realities and challenges:

- Collecting information on the socio-economic and technical circumstances at household and scheme level
- Capturing data into a model that calculates both the costs incurred by scheme management, and the possible contributions by farmers to cover these costs in a context of management by a water users' association
- Running the model on a scenario-testing basis, evaluating the impact of certain measures or decisions, or certain farmers' strategies.

SMILE principles

The following principles form the background of the approach:

- Establishing and sustaining multi-disciplinary and partnership, meaning that engineers, agronomists, extension agents, economists, development operators, farmers, decision and policy makers are involved in the process
- Considering local and specific circumstances, meaning that, although generic, the approach takes account of peculiarities and adapts to local circumstances
- Developing and using a typology of farmers, i.e. groups with similar strategies and characteristics

- Acquiring a managerial vision of the scheme, i.e. the management entity provides irrigation water and related services to farmers, who, in turn, pay back for such services (client-supplier relationship, although farmers partake to the management)
- Modelling then running simulations as ways to demonstrate and show the likely results of certain decisions or measures, to fuel discussion and make people interact, to challenge hasty judgements and support sound decisions, to raise new questions, and to foresee issues and problems.

SMILE field surveys

In-depth field surveys allow an accurate understanding of the schemes to be developed followed by a farming typology. This first step reveals the inner diversity of the schemes in terms of farmers' strategies and performances. The model SMILE considers:

- the costs incurred by irrigation water supply and related services,
- capital/refurbishment, maintenance, operation of the scheme, management and staff-related costs,
- land allocation, cropping systems and the farmers' strategies, which all define the farmers' capacity and willingness to pay back water services costs,
- the irrigation-water charging system (costs considered, choice of pricing, of base).

SMILE scenario testing

Scenarios are then tested which, among other information, shows the following:

- the viability of the current situation and ability to cover operational costs,
- total scheme operational costs and the distribution of costs between proposed capital investment costs and maintenance costs (a partial rehabilitation may prove more costly in the long run than a total one),
- major problems, typically that there is a majority of non-farming plot occupiers with low capacity and low willingness to pay water fees,
- feedback on actual land productivity which strongly limits farmers' income and capacity to pay back water services,
- through scenario testing shows how even slight changes can significantly improve the situation (i.e. reduction of the proportion of non-farming occupiers, shift from mere subsistence towards more commercial farming, increased cropping and improved cropping systems, etc.).

A number of recommendations, measures and decisions may be drawn from the simulations. Operators and decision makers should especially address inner land tenure arrangements, farmers' training, access to markets and services. An inescapable prerequisite to sustainable management is the establishment of a sound local managing organisation, which cost is included in the model. Although requiring accurate and reliable background data, the methodology shows major potential for

decision-making support and for investigation of sound management pathways. The conceptual framework that is proposed here forms the basis for the development of simplified and well-targeted questionnaires for populating the SMILE database. SMILE can be downloaded from the internet. Type google. Then SMILE.

4.3 Tools : Small Scale Irrigation Manual

The WRC Report No. 578/2/00, *A Review of Planning and Design Procedures Applicable to Small-Scale Farmer Irrigation Projects* (Crosby, de Lange, Stimie and Van der Stoep, 2000) is a practical and accessible resource book for anyone engaging in irrigation revitalisation. It presents a sound baseline of information on the following areas of interest in revitalisation planning:

- participatory planning ideas
- pre-feasibility and feasibility planning with emphasis on smallholders
- technical implications for designing or modifying existing systems for better management by smallholders
- innovative and **water efficient short-furrow irrigation** which can be used on any existing flood or new irrigation scheme to improve irrigation efficiency to better than sprinklers, as well as infield distribution efficiency to equal that of drip. The excellent potential of this technology is not utilised sufficiently in South Africa and it warrants much more attention and application.

The consultative planning method outlined below (ICON) is built on the Participatory Irrigation Planning methodologies and on the feasibility planning concepts of Chancellor and Hide, documented by Crosby et al. These methodologies have taken a next step and have been expanded into defined methodologies rather than leaving them as concepts.

If you are engaging in revitalisation the manual is definitely worth keeping as a resource book which covers technical and feasibility topics more so than this Rough Guide. The technical and design sections, particularly on short furrows and the need for technical redesign for better management of existing schemes are directly relevant to revitalisation planning and should be noted.

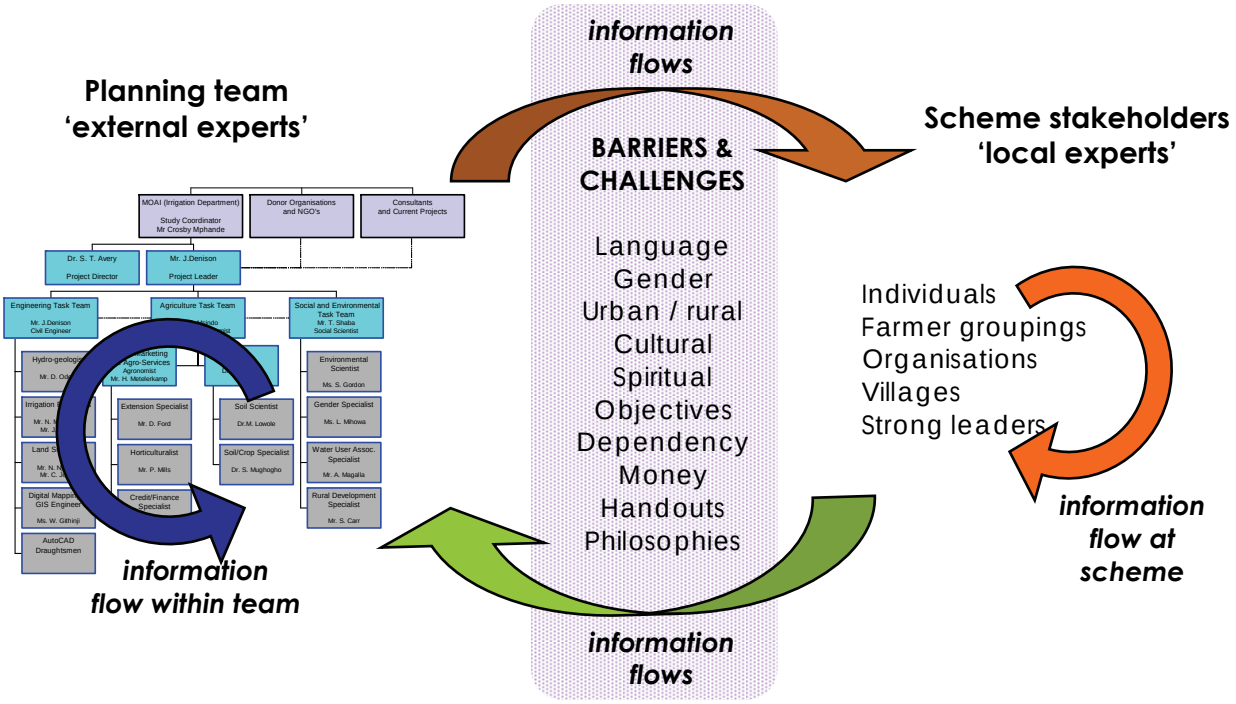
4.4 Tools: The ICON irrigation feasibility planning approach

ICON – The 'Iterative-consultative' planning approach for irrigation feasibility studies was developed and piloted with participants of ten irrigation schemes by the authors. The ICON approach is based on a range of PRA methodologies, RAAKS and participative planning methods. It relies on repeated consultation and feedback of consequential social, institutional, technical and financial information between the team of "technical experts" (sociologists, engineers, agronomists, economists, etc.) and the "local experts" (farmers and stakeholders). This is to ensure that informed collaborative planning and decision-making takes place. The consultation, feasibility planning and evaluation are all wrapped up into one highly iterative process emphasising information flows between as many people as possible. It gets a bit chaotic in the field, but the evidence is that it works. The detailed theoretical background, methodology, questionnaires, field programmes and a critique are presented in the Appendices of Volume 2.

Information transfer and 'local experts'

The challenges of getting experts trained in formal and relatively narrow specialist backgrounds to listen and internalise the extensive local expertise, is addressed through cyclical and principles-based planning. The practical application of the ICON approach on ten schemes with size varying from 25 ha to 2200 ha and the ongoing review and adjustment thereof, has resulted in a detailed practical guideline for community driven planning of irrigation revitalisation initiatives. The schematic below shows the information recycling process essential for meaningful joint planning.

Iteration of ideas and learnings necessary for meaningful consultative planning



Phased – efficient – quick

Phase 1 is a quick qualitative assessment carried out by experienced irrigation development planners to establish if there are any immediately evident fatal flaws. A typical checklist (from Zanyokwe Scheme – Eastern Cape) is shown below.

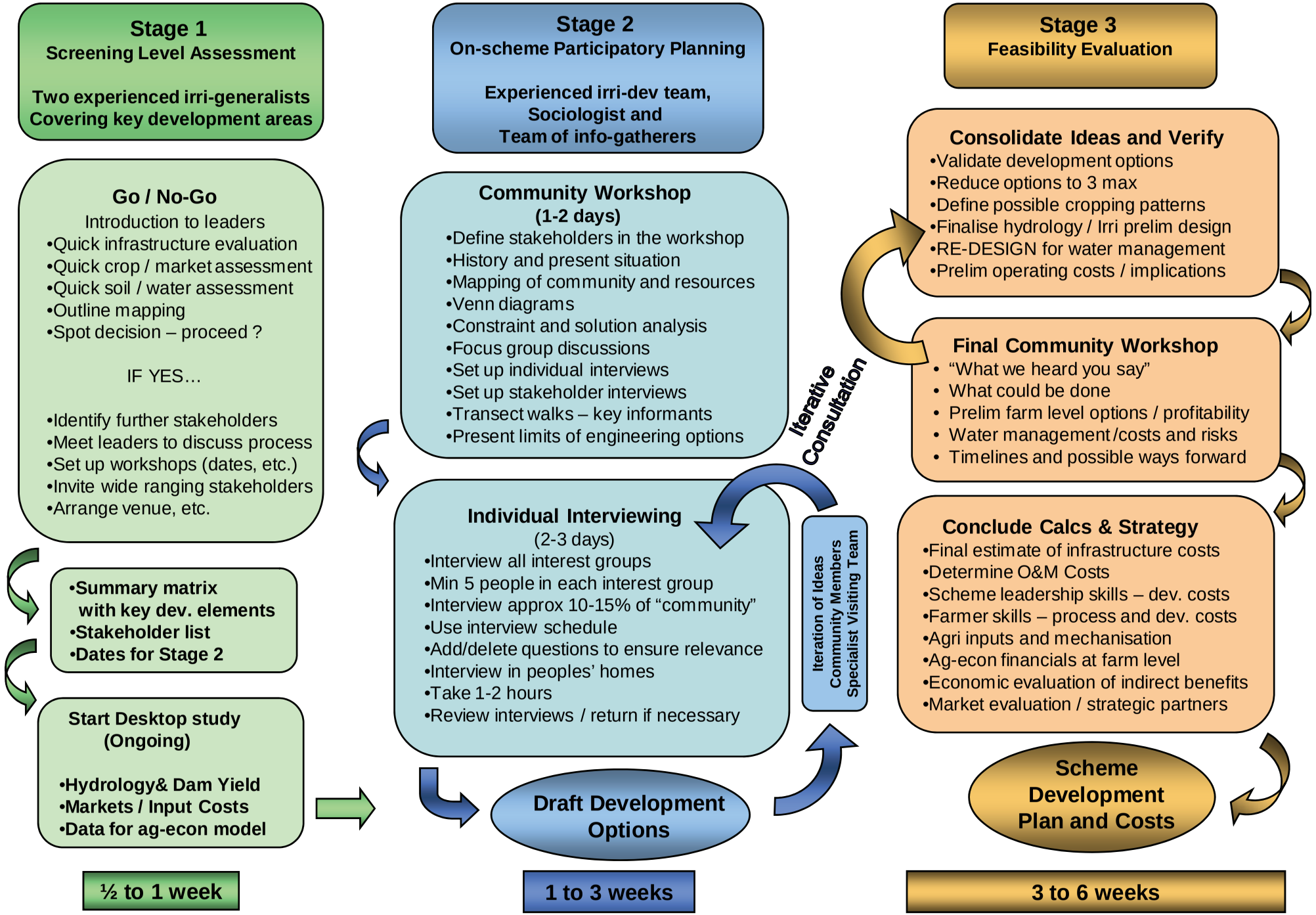
Water availability	✓	Sandile Dam. Hydrology review to confirm availability, but understanding is that Sandile is under-utilised.
Practicable water supply	?	Wolf River sub-component would require pumping. Kama Furrow sub-component is currently pumped from the Keiskamma River and has the option to be connected by gravity to the main of Zanyokwe scheme.
Land tenure issues	✓	Border Rural Committee is busy with a title adjustment process to be completed in 2004. There seem to be no major land tenure issues on Kama Furrow and Wolf River. Land holding is a mixture of quitrent, individual leased and also Trust leased land.
Irrigable soils	✓	Soils are well drained, medium textured with good irrigation potential. Kama Furrow = 60 ha and Wolf River estimated at 12 ha.
Agricultural knowledge and initiative	✓	There are active commercially oriented farmers on Zanyokwe who provide a reasonably skilled core around which newer farmers can draw on. The current irrigated activity at provides a positive basis for revitalisation and possibly expansion. The proximity of Fort Cox agricultural college has potential benefits if linkages are improved.
Financial and management ability	?	At Kama Furrow, four farmers indicated that they have covered unpaid ESKOM bills on behalf of the other five farmers who are less capable. Some financial capability is thus evident. Pumping costs are a threat to sustainability (WRC 98).
Willingness to participate	✓	There is a positive intent for the scheme revitalisation and possible extension to proceed.
Farmer organisations	✓	Ownership is vested in the Zanyokwe Agric. Trust. Each village has a Farmers Association and a process is in place to transform these into Co-ops. Tractor Association for mechanisation. WUA is in process but not active.
Labour availability	✓	Readily available. Skills assessment (2001) shows agric and construction skills. Lack of business skills but sense that farmers have initiative at Zanyokwe.
Market potential	✓	Markets of Alice, King Williams Town and East London are all accessible. Current sale mechanism is direct from land. Need for quality improvement, substantial scope for improvement of linkages, info transfer, and possibly packaging.

Legend: ***✓= OK*** ***? = uncertainty*** ***X = fatal flaw*** ***Proceed to Stage 2: YES***

Phase 2 is an intensive series of mass meetings, individual semi-structured interviews, focus group sessions. While ideas are being generated, a multidisciplinary team engages with the planning process and explores the practicalities, costs, implementation issues and feeds back information to the farmer and plotholder groupings. Over a period of three to ten days, depending on scheme size a set of two or three practical development scenarios are formulated.

These outline plans are evaluated in more detail in Phase 3 and a final cycle of iterations and discussions with farmers and plotholders is held to allow for revision and ensure full understanding of the final plan. The challenges of communicating complex production, financing, organizational, marketing and engineering information to diverse groups of landholders and farmers across language and cultural divides is addressed using approaches from social-psychology and anthropology but applied to irrigated agriculture. The ICON approach sequence of activities is shown schematically overleaf.

Figure 4.1: The ICON Feasibility Planning Approach



4.5 Making sense of the financial evaluation

This section is written for decision-makers, team members or scheme leaders to better understand the full meaning of the financial evaluation of different options so as to inform responsible decision-making. This attempt at simplifying a selected range of economic terms will hopefully allow clearer communication between teams, government and scheme participants.

While there are many manuals on feasibility studies, an outline of contents is presented later in this chapter to equip decision-makers, scheme-leadership (or feasibility study team leaders for that matter) to check that 'whole enterprise' planning has in fact taken place in what is submitted in a draft final report of the project plan. This structure is not a strict guide, but provides a sense of scope. More detail and comment on the structure and content of feasibility reports can be obtained in the small-scale irrigation manual (Crosby et al., 2000).

Financial and economic evaluations

Although often spoken as one and the same thing and having common building blocks, the difference between a financial and an economic analysis is very important to the decision maker.

A **financial evaluation** is concerned with cash and capital budgeting, financing and risk from the individual producer's or group of producers' point of view. This is clearly of central significance to the farmers (or potential partners) in the project and to the sustainability of the project. It gives the farm-gate enterprise assessment and tells the financial story from the point of view of the farmer.

An **economic analysis** and evaluation of a proposed project provides a basis for decision-makers to make spending decisions with public sector money. Alternative projects can be compared. The analysis involves the valuation of social costs and benefits expected to accrue from the investment in the project to the broader community rather than to the individual producers who will make up the project. It may, for example, value the benefits of employment creation, tax revenue, improvement in health and the economic multiplier effects of the intervention. It is concerned with the social return on the investment rather than the profitability of the individual participants.

An evaluation would normally form part of a feasibility study process and would commence with a financial analysis, to which social benefit and cost adjustments would be made in order that an economic evaluation can be done. The pioneering work of Gittinger (1982) should be used as a benchmark for those undertaking evaluations on smallholder schemes with a heavy social component in the evaluation.

Financial feasibility

The financial analysis (from the farmer's perspective) would typically comprise the following components:

- An **enterprise analysis** of identified potential enterprises (crops or livestock). Such enterprises would have been selected on the basis of an assessment of available resources, markets and technical considerations. This would involve the estimation of income and direct costs of the enterprises selected, at a farmer level and would determine their relative profitability.
- An **enterprise mix** would be determined on the strength of the enterprise analysis coupled with other considerations including markets, management expertise requirements, infrastructure, land areas and technical issues.
- **Capital costs** would be estimated on the basis of fixed engineering and irrigation and farm infrastructure requirements, as well as movable capital items such as vehicles and equipment.
- **Indirect (overhead) costs** would be estimated and would include administration costs, insurance, maintenance, management, etc.
- **Financing costs** would be estimated including interest, debt repayment.
- A **cash flow analysis** of all income and expenditure would indicate the funding requirements over time.
- A **projection of capital expenditure** and ratio analysis would provide an assessment of finances required and return on investment.
- **A risk and sensitivity analysis** would show the effect of different prices, yields, productivity and other key assumptions on the financial health of the proposed business.

Economic viability

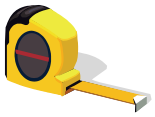
The economic analysis and evaluation (national investment perspective) would follow whereby the content of the financial analysis would be adjusted to take account of the potential economic and social benefits and costs which would be expected to accrue from the project investment. Some of these adjustments are theoretical in nature and often difficult to quantify or value. They should be conservatively estimated and decision-makers should be wary of using such adjustments to weight investments to any great extent. The objective is to determine and compare the costs and benefits to the economy with the proposed project as opposed to without the project. Such adjustments may include:

- Changes to prices of inputs and outputs to reflect their true value to the economy. Market values used in the financial analysis may, due to distortions resulting from protection measures (tariffs, subsidies, etc.), need to be adjusted to reflect their true value to the economy.
- Adding the value of employment created as a result of the project development. This may require an assessment as to the extent of the

employment created for unemployed individuals as opposed to employment provided to individuals already employed elsewhere in the economy.

- Identifying transfer payments – payments made by the producers which are transferred into the community for their benefit (e.g. taxes and levies, the value of employment, etc.) and/or benefits enjoyed by the farmers which are costs to society (e.g. state subsidies) and remove these from the evaluation.
- Opportunity costs – the value of benefits foregone as a result of the project development should be taken into account in the analysis as a cost (e.g. the existing value of production).
- Multiplier effects – which result from the external expenditure of income generated by the project and stimulate economic activities external to the project.
- Linkage effects – which result from increases or decreases in income generated by suppliers of inputs to the project (backward linkages) or by processors of the output from the project (forward linkages).
- Environmental effects – such as pollution, health, aesthetics are very difficult to value for inclusion in the analysis.

Evaluation Measures and Criteria



The **time value of money** is a well-established and accepted concept and is clearly understood if one considers the interest paid when one borrows money and the interest received when one invests money. The interest paid is the cost of having money to spend now as opposed to having it to spend later. The interest earned on money invested is the reward for foregoing or delaying current expenditure. Money now is therefore worth more than money at a future date.

Discounting is determining the present worth of future benefits. If money today is worth more than money in the future, then if we are to compare different streams of net benefits accruing from a project, or from different projects, over time, we must be able to convert the value of future benefits to present day values.

The **net present value** is therefore a measure being the total net present value of a stream of future net benefits or costs. The NPV of different projects cannot be easily compared to aid investment decision-making, as it provides no ranking for the order of implementation.

Economic analysis of this nature normally ignores the **effects of inflation** on prices and works with constant current day prices in cost benefit discounting. The assumption is made that the prices of outputs will change at the same rate as the prices of inputs. This is acceptable unless there is a clear indication that there is likely to a divergence between input and output prices over time.

The **discount rate** used for NPV calculations clearly places a time value on money, as does an interest rate. The rate chosen for evaluation purposes will affect the end result of the evaluation and the choice is difficult and theoretical. The most appropriate rate

is the marginal social rate of return or in other words the opportunity cost of capital in the economy. It is that rate which will just result in all the available capital in the economy being invested, if all possible projects were undertaken, which yield that or a greater return. If this were done it would result in optimal development decisions being taken. In practice Government determines a rate or rate range which it considers acceptable for development projects in the economy.

The **length of period** over which an analysis and evaluation should be done should equate approximately to the economic life of the major investment item. (In the case of an irrigation scheme this may be the irrigation infrastructure for example) Because of the effects of discounting over time, periods in excess of 25 years will make little difference to the resultant evaluation measures.

The **benefit cost ratio** is another evaluation measure which is calculated by dividing the total of the discounted benefits over time by the total of the discounted costs over time. Although a ratio of more than 1 (one) would indicate that benefits exceed costs and the outcome would therefore be positive, this measure has limited application in decision making as it does not provide a suitable ranking of different projects for decision making.

Sometimes called the **Internal Economic Rate of Return (IERR)** when applied to economic analysis, or the Internal Financial Rate of Return (IFRR) when applied to financial analysis, the IRR is the rate of return which yields a Net Present Value of zero. A project investment with an IRR greater than the opportunity cost of capital would be acceptable and the project with the highest IRR should be best investment, although sustainability considerations linked to operations and maintenance may dictate otherwise. A lower IRR for a gravity scheme may be preferable to a higher IRR for a pumped scheme given the practical management and cash flow implications for example.

4.6 The feasibility report

Project evaluation is the process of assessing the potential benefits and costs of a project leading to investment decision-making by public funders or private investors. Project evaluation should involve an assessment of the objectives of the project investment and alternative means of achieving these.

The evaluation should not be a separate or final stage in the process of the project feasibility study but should be integrated with all other aspects of the development in an iterative manner, so as to evaluate alternative strategies, land uses, infrastructure requirements and social impacts. Using proven methodologies such as ICON or SMILE will structure the process so that teams and 'local-experts' must interact dynamically in arriving at meaningful development plans.

An evaluation is necessarily based on numerous financial and non-financial assumptions, each of which can have a marked impact on the conclusions drawn and on the investment decisions taken. Key critical assumptions should be tested where possible to ensure local applicability and such assumptions should be subjected to sensitivity analyses to ensure that decision makers are aware of the potential risks.

1. Executive summary

In two or three pages provide a summary of essential elements of the project – objectives, purpose, location and size, beneficiaries, main components, investment amount and period, summary of costs and financial (farmer) and economic (project) evaluation results as well as the conclusion and any other main issues.

2. Introduction

An explanation of the appointment, project overview, location, objectives of the study, study approach, methodology, phasing of the study and time frames.

3. Background

Set the scene. Put the project into broad social and economic perspective giving some history of the project and area. Include socio-economic indicators, economic sectors of importance, other recent developments in the area, characteristics and constraints of the local agricultural sector, the need for the proposed a development and the target beneficiaries, national or provincial strategies of relevance and existing institutions of relevance to the proposed development.

4. Project objectives and rationale

Outline the objectives of the proposed project and some of the alternative means of achieving these objectives. State how this project and the particular development strategy adopted can achieve the objectives. What is the proposed scale of the project, its acceptability to identified stakeholders and their involvement and endorsement. State the possible project risks and steps taken to minimize such risks.

5. Stakeholders and consultation process

Identify key stakeholders and Interested and Affected Parties (IAPs). Explain the process of consultation, workshops and reporting leading up to the feasibility report.

6. Project resource assessment

6.1. The major objective is to present a description of the existing status of resources of the project and area where the project will be located. The data should be presented in relevant and suitable format – physical, agricultural, social, economic, institutional and legal.

6.2. Natural Resource Assessment – Hydrology, water yield, water storage, soils, topography, rainfall, temperature, wind, vegetation, land use and crop suitability.

6.3. Physical Infrastructure Assessment – water reticulation, water storage, buildings, fencing, security, roads, railways, pack sheds, etc., condition and applicability to development.

6.4. Socio Economic Assessment – Population, demographics, unemployment, income levels, poverty, skills audit, agricultural knowledge, social institutions, land tenure and size of holdings, land administration, farmer typologies, community and farmer aspirations, social services, political environment.

6.5. Agricultural Resource Assessment – Existing agricultural and livestock resources, land-use, farming systems and cropping patterns, input supply and product marketing, other economic activities.

7. Project description and development plan

7.1. Overview – brief overview of the objectives, location, size, components and other important features of the project. Relate the project objectives to broader objectives – IDP process of the municipality, provincial and national programmes and strategies. Identify and quantify the beneficiaries. Discuss the Development / Revitalisation strategy and framework:

- Commercial orientation
- Food security
- Commercial agri-business partnerships / joint ventures / contract growing, etc.

7.2. Infrastructure Development Plan – describe and compare alternatives for infrastructure development – water reticulation, water storage, irrigation design, water management, environmental implications, general facilities, on-farm buildings, structures and equipment, processing and marketing facilities. Cost estimates of the alternatives should be provided.

7.3. Agricultural Development Plan – alternative production methods and models, crop suitability, cropping alternatives, cropping programmes rotations, mechanisation, enterprise analysis (gross margin analysis and cropping areas).

7.4. Marketing Assessment and Plan – market strategy, market survey results, projected market size, location, market share, niche markets, price ranges, seasonality, packaging, transport.

7.5. Project Management and Administration Plan – A detailed description of all aspects of the operation, management and maintenance of the project including, human resource requirements, staffing, roles and responsibilities, communication and lines of authority.

7.6. Organisational Structures & Institutional Arrangements

- Land Issues – Unit sizes, ownership, tenure, leasing, consolidation.
- Support services, Capacity Building and Training – Management, mechanization, administration, financing, credit, training, mentoring, marketing, input supplies. Capacity building interventions should be identified for both farmers and management and support staff.
- Governmental Role – Clearly identify Government's role in the project, from short-term financing and implementation to long-term support including, subsidies, personnel, infrastructure.
- Legal structures – Contractual arrangements, legal structures, statutory obligations (taxation, etc.), constitutions, trust deeds, codes of conduct, financing agreements, levy structures, etc.

7.7. Environmental impact assessment must be considered. Scoping level may be specified in the Terms of Reference or scoping may follow the study.

8. Financial analysis and evaluation

8.1. Market and price assumptions
8.2. Enterprise budgets
8.3. Household budgets including food stuff, clothing, school fees, housing, etc.
8.4. Salary for farmers
8.5. Indirect (overhead) cost estimates
8.6. Capital cost estimates
8.7. Funding alternatives, phasing and financing costs
8.8. Farmer and project financial analysis
8.9. Cash flow analysis
8.10. Farmer profitability and return on investment
8.11. Farmer risk / sensitivity analysis

9. Economic analysis and evaluation

9.1. Valuation of Social Costs and Benefits
9.2. Externalities (external effects of the project development e.g. health benefits, pollution costs, etc.)
9.3. Transfer payments (payments made by the farmers which are transferred into the community for their benefit e.g. taxes and levies, the value of employment, etc., and/or benefits enjoyed by the farmers which are costs to society e.g. state subsidies)
9.4. Cost Benefit Analysis and Flow
9.5. Time Value of Money and Discount Rate Assumptions
9.6. Economic Internal Rate of Return (IRR)
9.7. Net Present Value (NPV)
9.8. Multiplier effects and forward and backward linkages
9.9. Risk / Sensitivity Analysis
9.10. Evaluation Conclusions

10. Sustainability

Discuss issues and factors, which will affect the sustainability of the project development in the short, medium and long term as well as the adaptability of the project to changes, which may affect viability and sustainability.

11. Conclusions

11.1. Social aspects – An assessment of the social impact of the project

11.2. Economic aspects – The overall conclusions drawn from the economic evaluation, the sensitivity analyses. Size of the investment, return on investment, risks, sustainability. State investor perspective, farmer perspective.

11.3. Recommendations - Recommendations and the way forward towards implementation.

12. Annexures

Maps, plans, programmes, cash flow and cost benefit schedules, etc.

chapter 5 land-exchange strategy

5.1 Creating a land market

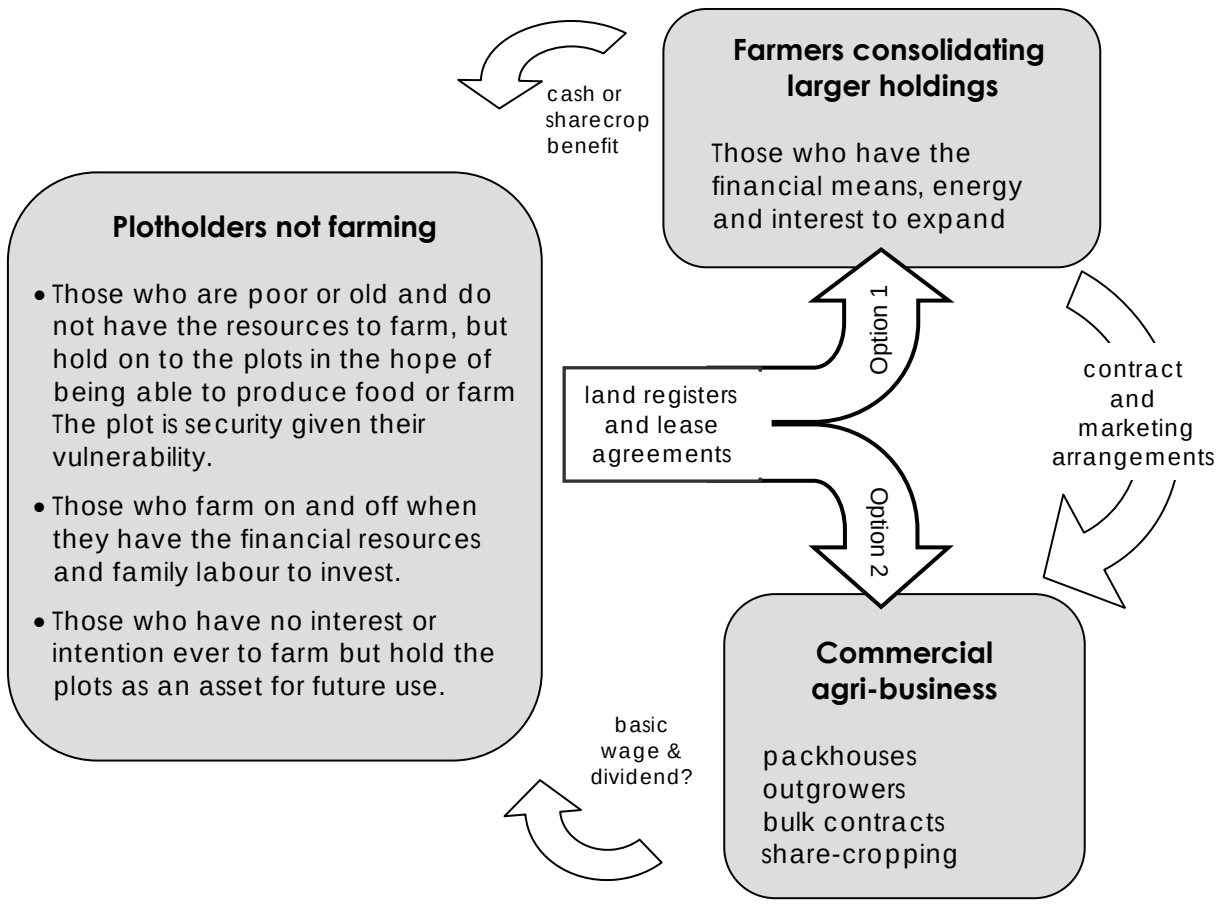
Most of the high-value irrigation land on the smallholder irrigation schemes in the former homelands is not being utilised and those who currently have access to the land tend to avoid leasing their plots. This is one of the main reasons for low productivity on schemes (Perret, 2002). The reasons for low utilisation relate to a wide range of factors including:

- The high risk nature of farming in an unregulated market environment, with minimal farming systems support and with low water reliability given poorly functioning technical and institutional systems.
- Low profitability and difficulty gaining market access.
- Inability to finance input costs in advance.
- Lack of motivation to risk available capital when major portion of income (75%-85%) is from non-agricultural sources, primarily remittances and pensions.
- Those who do not have the means to farm, but hold on to the plots given their vulnerability to poverty, where a plot is an asset of some kind.
- Alternative sources of livelihoods such as urban or rural employment are more attractive given lifestyle, risk and remuneration considerations.

There is clear evidence that farming trends in the rural areas are moving (have moved) from extensive production in fields (rainfed and irrigated) to more intensified food gardens along canals, or in home gardens where production is closer to home, lower risk and more intensive (Andrew et al., 2003 and Minkley et al., 2004). There is opportunity for leasing of land to those who wish to farm larger farm sizes but are limited because there is no land-leasing market. There is a passive resistance to the leasing of land on schemes, partly due to the fear that rights to the land will be lost if it is leased out. Any prospective lessee also faces the reality of securing access to land in verbal form only, which is not a secure basis for investment in the farming enterprise and may not extend over suitable times or include large enough fields.

Land consolidation initiatives and the associated institutional development component that is needed to support a land market strategy emerge from the discussion as a necessary area for engagement. This relates to different groups of individuals who have rights to irrigated plots and for one or other reason may choose not to use it. These choices need not be fixed and it is possible that people may choose to stop farming for a few years and when their situation (finance, labour) changes may engage in farming again (Van Averbeke et al., 2005).

Schematic: Transfer of land between those not farming and potential lessors



Land consolidation initiatives are a primary arena of engagement on schemes to increase plot utilisation where it is generally very low. There is research which looks at possibilities for increasing landholding size in communal areas (Van Averbeke, 2002). Two main opportunities seem to exist as a result of engaging with leasing.

Lease Option 1: Plotholder to farmer lease arrangement

The intended outcome is simply to allow those with current land-rights under the communal system a mechanism where they can retain the right to the land (typically a Permission to Occupy) but allow relatively secure access for a set time period through a legally binding arrangement to a lessee. This allows the more successful farmers on the scheme to expand their operations in return for a cash or share-crop fee in lieu of the lease payment. There is substantial precedent of sharecropping on schemes, which is similar outcome in one sense, but it remains informal and insecure. The formalisation process aims to change that and provide security for both the lessor and the lessee.

Option 2 for leasing: Block Lease to commercial enterprise

This is essentially the approach adopted at Tyhefu (case study in Volume 2) and is a coordinated effort to consolidate a large farm size, which provides the basis for a commercial partnership of some sort. Variations in ownership, amount of land leased and legal mechanisms for profit / risk sharing would vary and be tendered or negotiated with the prospective commercial partners. The social and financial pros and cons of partnerships are discussed in Chapter 5. Comments of this block-leasing arrangement from a land tenure point of view are listed below.

Potential application: Well-suited to larger schemes dominated by complex infrastructure (e.g. Centre Pivots, pumped sprinklers etc.) with high operations and maintenance costs. This method could also be useful for those with dilapidated irrigation infrastructure which can then be supplied by the commercial partner should no other investor be available. In these cases the land registration process is a key step to the partnership.

Potential application: The plotholders may also derive a benefit from a land exchange process if irrigation of a portion of the scheme is maintained for their use, but where bulk water supply costs and maintenance are the responsibility of the commercial partner who has access to the remainder of the irrigated land. This trade-off of land and irrigation infrastructure in return for the partner carrying operational costs (mainly pumping costs) may be a favourable option on schemes with high running costs, or with complex soils (give them to a better equipped partner to manage). The crux of fairness considerations will rest with the farm sizes allocated to the farmers and partner and the complications of the land re-allocation process that would follow for farmers.

Risk: This approach requires consensus agreement or at least widespread agreement among farmers and plotholders to succeed. There is a risk of land conflict by marginalised individuals not effectively represented by official structures, with resultant potential for conflict with the commercial entity later. A thorough land registration process is needed to clarify the situation.

If a flexible set of strategies is adopted on a scheme, there is every reason why the above two land-leasing options can be pursued in parallel on the same scheme. An example of how this might be achieved is in the case of Section 6 at Qamata where a number of centre pivots are in place. It is possible that this infrastructure and land is leased to a commercial entity. However, adjacent sections still under flood could follow the plotholder to farmer exchange. Alternatively, 'livelihoods' farmers could be supported to improve their farming practice on their existing smaller land holdings. Similarly the case for the Trust owned farm at Ncora and the adjacent 'commercial farms' that were developed.

5.2 Catalysts to land leasing

There is a catalysing link between land-leasing initiatives and off-scheme food production initiatives. The promotion home food-garden initiatives at Ludiza Scheme in the Eastern Cape served to relieve the pressure on small irrigated plots (1 ha) and facilitated the land-leasing process to allow consolidation of larger (9 ha), more commercially oriented farming enterprises. Older people who had Permission To Occupy simply did not want to farm but wanted some means of producing food for home consumption. Basic food production needs were planned to be met within the homestead through rainwater harvesting, underground tank storage and intensive gardening in beds. This created an amenable negotiating climate and stimulated the land consolidation initiatives (Umhlaba, 2006).

Food production in home gardens using intensive and diversified methods such as promoted by the Water for Food Movement and Abalimi Bezekaya (of the Western Cape), Care South Africa – Lesotho and many others, present a strong case for cost efficient, easily accessible production with immediate benefit to the home.

These models of home-food production using rainwater harvesting are outlined in Chapter 2. They are particularly attractive when linked to rainwater harvesting into low-cost 30 m^3 underground tanks with consequent multiple water use and water conservation advantages. Home gardens are squarely placed within the locus of control of women and make a logical first intervention point when targeting poverty through agricultural production. Access to irrigated garden plots or food plots on the schemes themselves is a second alternative, but does not have the independence that a large underground tank provides. The irrigated garden plots remain dependent on the functioning of the bulk irrigation system with all of the technical social, institutional and financial implications.

5.3 Land leasing methodology

A new strategy was developed through action research during the period of this project and has been included in this chapter as a guideline. The detailed case study of the land-leasing arrangement is presented in Appendix A of this Volume 2.

Land register step 1: Introduce the idea and process

Engage the broader community, including both plot holders and aspiring farmers in in-depth analysis of the problems. The facilitator should keep discussions focused by identifying those members of the community who have specific land-related problems. One method which could be used is to interview in the presence of a bigger community group with a view to sensitizing them to the problem.

The discussions should focus on the following:

- stating (defining) the problem
- the extent to which the problem affects the community and poverty
- how the problem could be solved within the local context focusing on what the community could do

Alongside the consultation process, aerial photography covering the project areas should be sourced. Ensure that the photographs are geo-referenced so that they can be used to plot Geographic Positioning System (GPS) measurements. It is important that the community is shown a sample of what the final product is going to look like and an explanation is given of how the plan could be used in future land dealings.

Land register step 2: Demarcate and survey with a GPS

Each plotholder or a member of the immediate family should be requested to walk along the boundaries of the fields carrying a GPS. The GPS must have accuracy of less than one metre in the horizontal plane. Vertical accuracy is not important in this exercise. The GPS should be set to collect coordinates at approximately 2 metre intervals. This process should be carried out in the presence of other plotholders with land in the area. The actual operation of the GPS data logger should be managed by a competent technician, and the role of community members should be limited to carrying the GPS and walking along boundaries. The name of the land owner should be captured on the GPS for each land parcel measured. The size of the land (measured in ha) should be given to the plotholder immediately after the walk.

The presence of other local observers will serve to restrain those land owners who may have an interest in extending the boundaries of their land. In the eventuality of disagreements emerging (which can be expected on schemes and is part of the objective of the exercise) a mediation process should be facilitated.

Local youth carrying GPS, and technician accompanied by land owner

Land register step 3: Facilitate a mediation process where claims conflict

It may take a significant period of time to resolve all of the differences on large schemes using conflict resolution and mediation[4], but it is unlikely that any progress in revitalisation planning can be made unless these differences are tackled up front. In the case of serious disagreements during the surveying process (of which there may be many) the contested portions can be surveyed as discreet entities and marked up on the map as such, after which a more intensive conflict resolution process involving scheme leadership, civic authorities and the Tribal Authority can be facilitated.

Land register step 4: Produce maps

Once the tachey-survey of the village is completed, the GPS data should be overlaid onto aerial photographs. The data needs to be cleaned for minor survey errors, after which temporary numbers can be allocated to each of the land parcels. The large maps (A1 or A0 size) with individual land parcels marked up should be printed. Each plan should have a record of the land parcel with the temporary number and the name of the land owner. Figure 5.2 shows a map that resulted from this process.

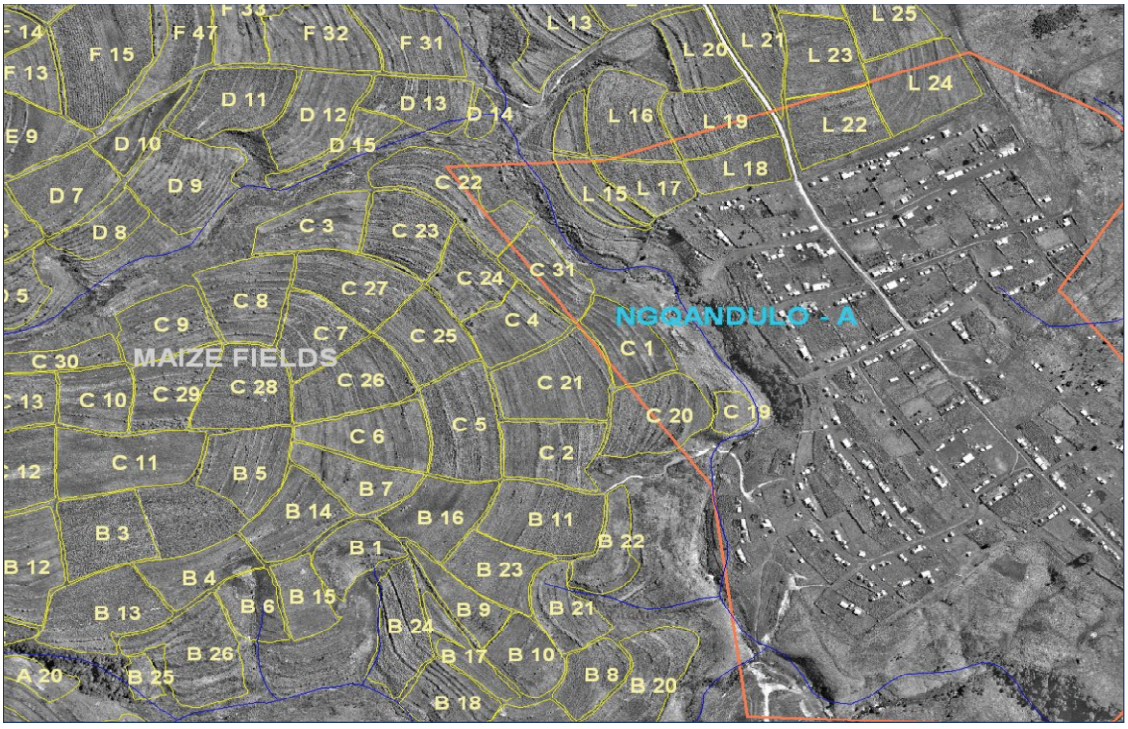


Figure 5.2: Map with plots overlaid on aerial photographs

[4] *On schemes such as Makuleke, Ncora, Tyhefu and many of the schemes from the homeland era (TIS schemes) new farm layouts were superimposed on smaller, older and established rainfed fields. There is still contention about whether the scheme boundaries or the underlying older boundaries and ownership are valid. Uncovering this is one of the primary objectives of the process because, unless this is resolved, it becomes a recurrent destabilising factor in all attempts at revitalisation (see Volume 1 for the Makuleke case where it was a stumbling block but was successfully resolved, and the Tyhefu case where it was not identified as an issue until it was too late).*

Land register step 5: Demarcate hydraulic & production units

The printed plans should be used as a basis for further engagement with the plotholders, to further demarcate the lands into larger contiguous units which cover both hydraulic units for appropriate water management and "production units" as the specific situation requires. Production units should be a contiguous combination of individual land parcels that, in the opinion of the team, constitute contiguous economic units, or are based on decisions to collaborate in one or other aspect of the farm production cycle (co-operative mechanisation, for example). The size of production units will differ according to circumstances. Each production unit should be labelled alphabetically. Plotholders in the same production unit should have different numbers but should share the alphabet symbol allocated to the unit, i.e. A1, A2, A3 or B1, B2, B3, etc. Depending on the nature of the project, land owners belonging to a single production unit could use the production unit as an elementary form of organisation to plan operations and deal with their needs as an organized unit. The farming style groupings discussed in Chapter 2 may be applicable here. Each production unit could elect a small leadership committee and/or a production unit leader to represent the unit on all matters where the unit has dealings with the broader project or outside agencies.

Land register step 6: Identify opportunity for land exchange

The printed plans should be used to gather more detailed information on the individual plotholders, which can include size and age structure of the family, willingness to engage in farming, labour availability, current or pre-existing land exchange arrangement, availability of land for leasing, etc. Through the process of communication with both land owners and non-land owners, those who are interested in getting land and those that have access to land can be identified and introduced to each other within each production unit.

The facilitator should encourage those land owners who are not interested in engaging in agriculture to lease their lands to those who need it. The prospective lessees and lessors should be given a chance to negotiate among themselves, without the influence of the facilitator. **It is important to emphasize among the prospective lessees and lessors that they are all free to enter into an arrangement with parties of their choice, and that both parties must be willing participants in the agreement.** Any land consolidation which is to take place should be facilitated at this stage with caution and sensitivity to local concerns.

Land register step 7: Agree on lease amounts

Base on local considerations, the nature of the project, and realistic expected returns, the facilitator, together with the land owners, should come to an agreement on per ha lease norms. It is also at this point that broad agreements should be made on how and when lease payments will be made (i.e. monthly or annually).

Land register step 8: Formalise the lease contract

Where an agreement is reached between the prospective lessee and lessor, the facilitator should help formalize the relationship into a lease. The lease agreement should be simple (see example below). The terms of the land exchange agreement as well as rights and responsibilities of both parties should be fully explained. It may be useful for the lease contract to be translated into the local language.

There should be common understanding of the terms of the agreement. The exchanging parties should be given copies of the agreement and a local representative institution should keep original documents. The appropriate institution should be trained for this role. A copy of the lease agreement should be kept by the tribal authority for future reference purposes after it has been signed by both parties.

Part 1 of the sample of lease agreement (developed by the authors)

Memorandum of Agreement of Lease
Form 1(a)
The details, terms and conditions incorporated in this agreement are subjected to form 1(b), and the parties contracting hereto are bound by terms incorporated in form 1(b).

Made and entered into by and between

……
Hereafter referred to as the ("Lessor")

And
……
Hereafter referred to as the ("Lessee")

1. The Lessor hereby lets to the Lessee certain piece of arable land situated at ……..Irrigation Scheme, measuring approximately ……..in extent,
2. The lease shall be for a period of ……. commencing on …….
3. The annual rental payable by the lessee during the currency of this lease shall be R……. or alternatively whatever terms the two parties agree on verbally, as long as they are not contrary to the laws of the Republic of South Africa.
4. The agreed remuneration stipulated above shall be paid annually by no later than……

THUS done and Signed at……on this day of…….. In the presence of the witnesses.
Lessor……

As Witnesses:
1……. 2…….

This Done and Signed at……on this day of…….. in the presence of the witnesses.

Lessee……
As Witnesses:

1……. 2…….

Part 2 of the sample of lease agreement (developed by the authors)

Memorandum of Agreement of Lease
Form 1(b)

Witnessed:

1. The plot hereby leased shall be used by the lessee for agricultural purposes and shall not be used whatsoever for any other purpose without the prior consent of the lessor, which consent shall not be unreasonably withheld.

2. The lessee shall not be entitled to sublet the plot or any portion thereof, or to cede, assign, transfer, alienate or otherwise dispose of its rights of occupation or use under this agreement, without the prior consent of the lessor, which consent shall not be unreasonably withheld.

3. The lessor or its duly authorized agents or servants shall be entitled during the currency of this lease to inspect the plot at all reasonable times.

4. The lessee shall conform to all laws, ordinances and regulations specified by community in connection with the use of the plot.

5. The lessee hereby undertakes at its own expense to care for, and maintain the plot and irrigation infrastructure as required by the scheme policy, pay water fees and shall upon the termination of the lease, redeliver the same to the lessor in good order and condition.

6. Should the fields be destroyed or damaged to such an extent as to render them unworkable, then either party shall be entitled to declare this lease cancelled, by notice in writing, given to the other party within 30 days after the destruction of the fields. If no such notice is given by either party this lease shall not be terminated and the lessee shall be obliged to proceed expeditiously with the work of refurbishment of the field.

7. In the event of the rental or any other form of remuneration agreed upon, not being paid by the agreed date or any other amount due in terms of this agreement, not being paid on demand. The lessee committing any breach of the terms of this agreement, and failing to remedy such breach within 7(seven) days after notice has been given, by the lessor to the lessee, requiring the lease to remedy such breach, the lessor shall be entitled, not obliged to cancel this lease, by giving written notice to that effect.

8. No cancellation of this lease shall be effected between ploughing and harvesting time.

chapter 6 intervention and support strategies

6.1 Illustrative cases

This chapter is the final compilation of ideas and experiences that are the guidelines and help formulate and implement the development plan. The chapter includes a précis of relevant bodies of work and of useful programmes from which ideas can be drawn and modified. These are intended to be inspirational rather than prescriptive. Ideas from the cases that are outlined can be used alone or in a mix to provide the essential support for production and marketing elements. These include:

- A needs-based farmer training programme
- The "Agri-Business Place" one-stop shop for support to entrepreneurs
- Farmer Support Teams – The LIMA Approach
- Partnerships with academic institutions – Ezemvelo case
- Irrigators as outgrowers – The Makuleke Case
- NGOs in Partnership with farmers – The Noko Case
- Sharecropping arrangements – The Giba Case
- Sharecropping variation – The Tyhefu Case

Chapter 7 finally summarises the strategies and how these fit together into the guide in a tabular summary. It is hoped that this will assist decision-making on the most appropriate approaches to give substance to the strategies that have evolved.

6.2 Needs-based farmer training

This section is taken from the WRC Report No. ***TT 254/1/05; TT 254/2/05; TT 254/3/05***, *Revitalisation of Smallholder Rainfed and Irrigated Agriculture in South Africa* by Botha and De Lange (2006). The Guide for Trainers and Facilitators was an action research project that aimed at transferring practical skills to resource poor farmers, institutions and communities. Resource poor farmers, youth and women's groups are the primary target groups for enhanced skills development in agricultural production, water use, management, business and entrepreneurial capability.

Smallholder farmers currently have limited access to training. Furthermore, formal training is focused almost exclusively on scaled-down versions of high-cost, high-risk commercial production practices which are especially inappropriate to food insecure households. Much of the current training also requires trainees to be away from their homes for periods ranging between three weeks and several months. This is impossible for many – especially so for the women responsible for food-insecure households

It is a core proposition of the Rough Guide that irrigated food production for food security is not a financially or economically sensible strategy on many schemes, especially those which have significant running costs (i.e. TIS Scheme). The financial returns often don't justify the farmer's effort and risk and the economic returns don't justify the state's investment in revitalisation – (see Chapter 2 for discussion on theoretical rationale, costs and practicality of food production on TIS and lower cost flood schemes).

One approach of "development through needs-based training", was developed by Johann Adendorff successfully in the training of approximately 7 000 poverty-stricken rain-fed maize farmers in Phokoane in the Nebo district of the Limpopo Province over a period of five years. Through appropriate training, organisation and improved self-confidence, farmers considerably improved their yields from an average of 3,5 bags per typical 1,2 hectare holding, to a new average of 40 bags. The "development through needs-based training" approach has since been used in several rainfed areas in South Africa and is currently being used in poor rural communities with access to irrigation schemes. In particular, the Limpopo RESIS programme provided a valuable opportunity to implement and test the training approach.

Simultaneously, the information and data gathered in this WRC project on needs-based and other training approaches used in the RESIS programme is being used to develop further training courses and training modules. These curricula are now being institutionalised at the two Agricultural Colleges in the Limpopo Province, Tompi Seleka (Marble Hall) and Madzivhandila (Thohoyandou). The training material has to be registered with the Primary and Secondary Agriculture Sector Education and Training Authority (AgriSETA). After developing the Unit Standards, the Limpopo Farmer Training Team presented the training to farmers in Limpopo over a six-month period. Thus, a methodology for training of farmer-trainers was developed and tested and is available.

(Authors' c*omment: The Needs-based Approach targets non-literate learners through a dynamic and entertaining series of stories and anecdotes, creating easily remembered mind pictures which capture the detail needed for crop production. Training is conducted in farmer's own fields and targets mainly maize production, but has broadened to include primary food crops (e.g. cabbage). The approach is useful in the power it has to reach non-literate learners and that it has been developed formally for inclusion in approved training curricula.*

The crop production paradigm that underlies it is perhaps one limitation the published material as it relies on mainstream commercial production methods (plough, plant, fertilise, insecticide, hoe and harvest) which are inherently costly and have higher external market dependency. While much improved farmer motivation and higher yields have been achieved through the improved practices (spacings, varieties, plant timings, disease and insect identification, etc.), applicability to irrigation crops other than green maize seems limited. Success in dryland maize applications and on schemes with low running costs (flood) make this a suitable approach for the 'smallholder farmers' and perhaps for 'commercialising farmers' growing green maize. The underlying production concepts need to be interrogated before application and the unavoidable costs linked to ploughing and input market dependency need careful consideration.

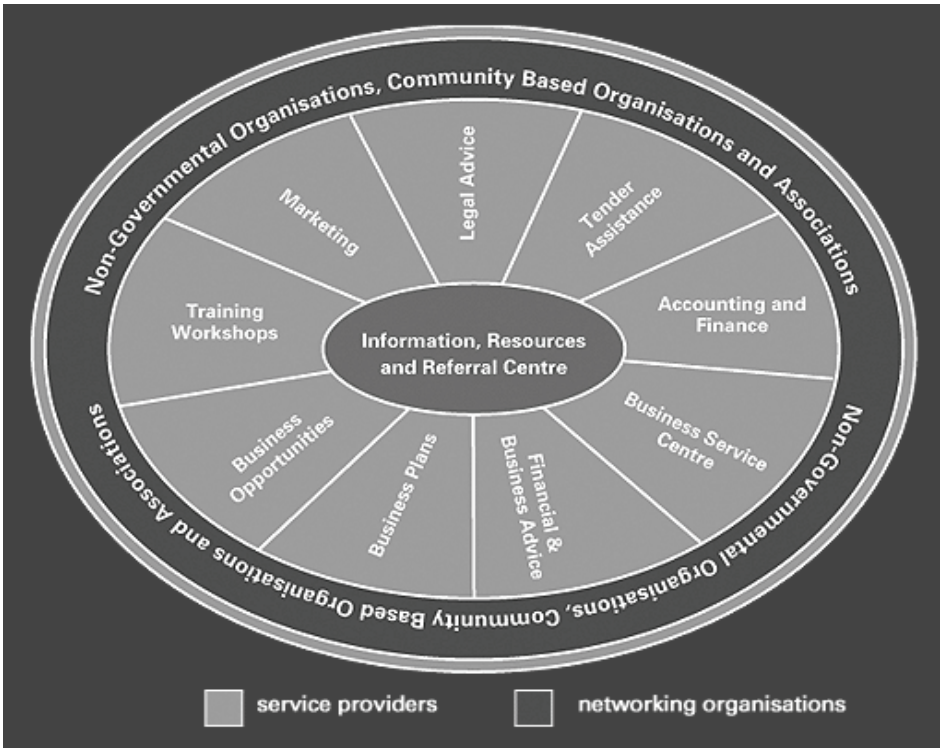
It is worth noting that the underlying production concepts are significantly different from that of conservation agriculture (see Chapter 2) which while also underpinned by a low-risk, low-input approach relies on no or low-till methods, growing diverse food, fodder and cover crops. Conservation agriculture approaches are probably more suitable for the low-risk and diversified emphasis of the 'smallholder' farming style than the "needs based approach" as it is currently developed in the WRC guide. The underpinning training approach is still however valuable.

6.3 The Agri-Business Place – entrepreneurial emphasis

The Agri-Business Place (ABP) was initiated by Investec Bank together with British American Tobacco, the Sustainability Institute in Stellenbosch and Abalimi Bezekaya, an NGO. It has been established at the centre of the Lansdowne development node, bordering the Phillipi horticultural area and the expansive informal settlements of Crossroads, Nyanga and Browns Farm. The ABP has 8 hectares of land which are used for organic training, demonstration gardens and micro-farms. There will also be a learning and advice centre for gardeners, farmers and other entrepreneurs.

Development model: One-stop support shop

The Agri-Business Place is seen as a business development centre with 'porous boundaries' that will offer both services and resources to farmers around the dense informal settlements crowding around it. Negotiation with and involvement of the local leadership and community groups has been a central part of the process.



Source : www.thebusinessplace.co.za

A number of **different enterprises and services** are housed at the Business Place. These have been chosen so that they can provide a broad and holistic support service to small scale farmers and entrepreneurs in the area. The following services and facilities are available:

- An information centre
- Microfinance
- Bookkeeping
- Business plans and office services
- A catering facility
- Abalimi Bezekhaya Office; an NGO (non government organisation) offering farming support and advice. Their programmes include implementation of urban gardening and greening projects, the supply of tools and gardening resources, craft initiatives, training, organisational building, partnerships and special projects, research, monitoring and evaluation.
- The Department of Agriculture as an agricultural service provider
- Connections; an NGO providing IT training and community based organisation capacity building
- Training in business management; a micro-MBA – 5 day course.
- SEED: Schools environmental education and Development. SEED runs a sustainable school programme, which is a 3 year programme that results in the implementation of Permaculture systems at schools, linked strongly to teaching practise through the Curricula for Growing. A contract with Educo[5] will strengthen SEED's learnership programme and will provide in service training towards the development practitioner learnership.

Future enterprises may include

- A legal assistance facility
- Other potential ventures and partnerships

The Information Centre

The information centre is a visitor friendly and welcoming space for anyone who needs support for their **ideas on small businesses**. They are required to pay a small fee for this service. The main costs will be supported through funding from various sources including the Umsobomvu Youth Fund.

The South African Institute of Entrepreneurship have put together an innovative methodology to train both literate and non-literate gardeners in **agricultural business** practices. ABALIMI was part of the design team and all field staff have attended the training of trainers course. The course is known as the Agriplanner and is an accredited training course at NQF[6] level 4.

[5] SEED Update, April 2005. seed@intekom.co.za

[6] Agriplanner Business Game. The South African Institute of Entrepreneurs.

'Connections' NGO for organisational support

Connections is a vibrant NGO that provides upbeat support in organisational development and institution building. They have designed and are working with a learning toolkit for community development workers comprising the following themes:

- Understanding community development work
- Strategic planning; community research
- Building an organisation; constitutions, leadership, governance, policies
- Team building and organograms
- Resourcing, implementation and monitoring and evaluation.

Computer training and organisational development processes with the Community Based Organisations (CBOs) is undertaken. Coaching and mentoring continues for a year or more. Presently Connections is working with a number of crèches, youth projects, HIV/AIDS support groups and craft groups.

The CBOs themselves pay very little for these services. Funding is sourced through NGOs and contracts with Local Government and the Municipalities. Organisational development consultancies also add to the income. The organisation is also involved in the production of materials and facilitators' guides. They engage also in advocacy and research work and have implemented an internal learning process for staff members.

The organic packhouse and marketing facility

The organic packhouse is formed through partnerships with a number of organisations and businesses. Abalimi Bezekhaya have put together a proposal to Pick and Pay to support the facility by financing the packhouse and a vehicle for collection of produce from small farmers. The model includes a **cellphone and internet-based marketing** system designed, pioneered and supplied through Permacore[7], in Cape Town. This system involves the registration of small growers on a data base. Their weekly produce availability is collated through the use of a cellphone SMS system. This information is posted on to the web based system where buyers then place their orders, either through the marketing facility or directly with the sellers.

Farmers will be paid on the day, in cash, on collection of their produce. Quality of the produce will be checked by the driver of the vehicle, who will be trained to have this expertise. It is thought that all produce of the desired quality will be purchased by the marketing facility, who will then carry the risk of re-sale of that produce to the buyers on the database or to find other buyers. As a last resort produce will be taken to the Fresh Produce Market. It is envisaged that the enterprise will need funding initially, but that it can in fact become a sustainable business. The significant elements of this model are that **farmers are paid in cash and the marketing facility takes the risk**, rather than the farmers which is conventionally the case.

[7] Permacore; Beau Horgan, beau@tctc.co.za

Other potential ventures

The introduction of orange-fleshed sweet potatoes to growers is envisaged through the growing of a demonstration plot at the Business Place. The growing material will be obtained from the Agricultural Research Council (ARC).

Abalimi Bezekhaya have been planning, with the surrounding community, to institute a large garden with small individual gardening plots. 100 members are to be given access to 100 m^2 each. They will be trained in the **organic, low external input systems (LEISA)** that Abalimi have been promoting and working with for many years in these urban areas and informal settlements. Access to this land is significant for this community, as most of these people live in shacks with no access to land or water.

A group funded through the National Department of Agriculture (NDA) are to introduce the production of herbs for **manufacture of essential oils** as a demonstration at the centre. It is understood that many members of the surrounding community have links with the rural areas and that these kinds of enterprises can be promoted in these areas, through their introduction and promotion at the centre. The Business Place is also working in partnership with the Sustainability Institute situated at the University of Stellenbosch. They offer training and research qualifications in development.

6.4 The LIMA approach – farmer support services

LIMA is an NGO operating in KZN, Mpumalanga and the Eastern Cape and has adopted a farmer support services approach to bridge the knowledge gap experienced by smallholder farmers. They work in both the irrigated and dryland context.

Basic service linkages

The term agricultural extension is well understood, however in a developmental context a much broader concept called “farmer support services” has been developed. To break their economic isolation emerging farmers need to establish direct market linkages with the providers of the following basic services; finance, inputs, power, information, markets. A number of complex institutional issues play an important role.

- Access to land and water in the absence of functional markets
- Organisational dynamics & governance
- A complex public sector and traditional authority environment
- Grants and handouts that undermine and distort markets as well as creating an environment of both dependency and opportunism.

These institutional issues add considerable transaction costs and confusion to the provision of farmer support services. Given the potential instability in community based groups and organisations and land markets LIMA plays an **"external oversight" and dispute resolution role**.

Support package

The development of farmer support services is normally the single biggest challenge facing the successful establishment of smallholder irrigation schemes. Farming systems cannot exist in isolation and must be linked into business and information systems. LIMA provides farmer support mainly to the input-side and on-farm methods, through its programme of fieldworkers.

Agricultural businesses will invariably seek out opportunities and provide necessary services but this will only be the case if a critical mass demand for services is achieved. As emerging farmers are small, **group organisation** and coordination is essential for achieving mass. LIMA works with government agencies to **form groups to gain critical mass**, and to establish the necessary business linkages and to breakdown the isolation that the farmers finds themselves in. Agricultural development facilitation involves the activity of creating tangible, direct and sustainable linkages between farmers and a range of external farmer support services.

Input Supply: The strategy is to organise farmers and set up a clear system of communication with suppliers and facilitate payments. This is for crop inputs as well as mechanisation. Cellphone communication and electronic payments are standard to facilitate transactions. Considerable technological innovation is incorporated into agricultural inputs, and experience shows that the input supply service is perceived by emerging farmers as one of the most tangible and most appreciated.

Agricultural credit: LIMA plays no direct role in the financing of farm operations, other than providing information as to where farmers might be able to get finance.

Advice & Training: LIMA has agricultural officers who are trained and supported by a central management team comprising agricultural experts. The agricultural officers move with a small team in their own vehicles between projects and farmers, and act as a conduit of information between the farmers' information sources based at the head office. LIMA considers this Government responsibility but bureaucratic hindrances have resulted in poor and fragmented government.

Product markets: the production planning process starts off with selecting crops based on market expectations to inform an enterprise mix, crop mix and production programme. LIMA plays a direct role in assisting in the planning and developing the market links through provision of information.

Farmer support team – 'extension unit'

The farmer support team requires a mix of complementary skills covering management and farm production support, including managers, specialists, extension officers, extension assistants and master farmers

The **central roleplayer is the agricultural facilitator**, who has an agricultural diploma, a bakkie, two assistants and loads of enthusiasm. This would be the basis of an "extension unit" and would cost between R30 000 to R35 000 per month depending on the loading of management & specialist support time. An "extension unit" should have the ability to service 400-800 emerging farmers and work with at least 20 farmers associations or groups.

The **management team** is responsible for all normal project management functions including setting up, preparation of log-frames & key performance indicators, and achieving these. The support team can consist of part-time technical people, the economist and market linkage specialists. Market linkage activities can be neglected if this is not a specialist function.

To reduce costs and increase spread and number of farmer contact hours extension assistants and master farmers are hired. An **extension assistant** is a locally hired individual with an aptitude and interest in agriculture who is hired on a full-time basis. This person would use public transport or could alternatively be provided with a motorcycle. A **master farmer** is a selected successful emerging farmer who is paid a monthly stipend for sharing information and demonstrating techniques to farmers in the neighbourhood.

6.5 Farming and mentoring partnerships

A description of farming partnerships in South Africa is provided in Volume 2 – Chapter 4 (including commercial, academic, and NGO variations on the theme). This includes their theoretical context as well as more detailed reports on five case studies undertaken in the course of the project. This section attempts to communicate the useful pointers and notes of caution that have emerged from that detailed investigation. The definition of 'partnerships' was broadened beyond the prevailing colloquial meaning (ie. commercial sector partner in a Joint Venture of one kind or another) to include other mentoring and partnership arrangements with academic institutions, government as an investor, and with NGOs.

Table 6.1: Selected Case Studies and Partnership Typology

Scheme Name	Partnership Typology (1)	Description
Makuleke Irrigation Scheme (Limpopo)	Outgrower scheme (cotton)	A cotton partnership with Noordelike Sentrale Katoen was a key strategy for the scheme but failed due to global cotton price decline in 2005.
Noko Development Trust (Mpumalanga)	Contract / Outgrower (combined with NGO mentorship) (wheat, maize, lucerne)	Simple contract-farming agreements and a broad-based development approach, with mentoring by a supportive NGO, underpin the steady increase in production that this scheme has achieved. This is tempered by the exclusion of many beneficiaries through land consolidation and the emergence of a single commercial black farmer on a larger farm.
Giba Community Trust (Mpumalanga)	Share produce scheme (bananas)	A private management company, SA Farm Management has complete authority on all farming and marketing decisions in a profit share arrangement with landholders of the banana producing irrigation scheme. Issues of lack of empowerment, training and autonomy are a factors at play.
Ezemvelo Farmers Organisation (KwaZulu-Natal)	Academic Institution Partnership (High value organic vegetables)	The organisation has a close and symbiotic relationship with KZN university and is cropping high-value organic veg for sale to Woolworths. Information and support is provided by the academics who use the site for extensive research including expansion of irrigation.
Tyhefu Irrigation Scheme (Eastern Cape)	Share produce scheme (with risk shedding) (mixed vegetables)	The Department of Agriculture is a key player in this tri-partite arrangement where the commercial entity has shifted financing risk wholly onto government. Government is the primary financer of all capital AND ongoing production costs of this horticultural venture for the export market.

Note 1: After Mayson (2003) noting that two categories, namely share-equity schemes and municipal commonage schemes have been excluded as these do not pertain directly to the irrigation revitalisation context. NGO mentorships and academic partnerships are categorised from this study and are not in Mayson's definitions.

6.6 Ezemvelo – academic partnership

Rolling hills of Ezemvelo

The case of the Ezemvelo Farmers' Organisation and the informal partnership with an academic institution which has catalysed a development process, presents a number of lessons of good practice in agricultural development which can be translated directly to the revitalisation context. Of particular importance is the clear potential that **academic institutions can play as development facilitators**, active collaborators and a magnet for funding – while undertaking research and gaining directly from the academic process in return. Some of these positive outcomes resulting from the dynamic nature of the "partnership" at Ezemvelo are arguably the outcomes of activities themselves and in-process learning, rather than the explicit intent of the initial interventions.

Trust and flexibility: This initiative has had the ongoing vision and support from a few dedicated individuals who play key roles in linking the project with external markets and sources of information for crop production. The relationship has been built on trust between a small group of lead individuals in the farmers organisation and from the academic institution. Flexible and responsive collaboration with a supportive market agent and a wide range of opportunities has seen a slow but steady increase in project momentum over 6 years.

Existing knowledge and practice: The core of the cropping initiative (growing organic vegetables based on traditional cropping approaches) has built on what farmers were already growing and doing.

Research as a driver: There has been increasing research interest and the research projects themselves have generated momentum which has attracted further funding. The academic partner played a facilitation role while using the project as a research site. It can be seen that a research relationship is an excellent basis on which to introduce more complex initiatives, such as rainwater harvesting or conservation agriculture into furrow irrigation systems on other schemes.

Broad Benefits: Farmers are positive even though their financial gain has been modest. There is a sense that benefit to the community is seen to include more secure marketing channels and better integration with external players – not just profits.

Growth from small successes: The Ezemvelo Farmers' Organisation has expanded from 20 members (certified organic) in 2001 to around 170 members this year. The EFO has managed to remain flexible and to set up internal systems of management that have been productive for them.

Niche market – high value crop: The secure market access through the packhouse as well as direct relationship with Woolworths is a key part of the project success. While this is true for Ezemvelo, registration is challenging and a potential stumbling block for other groups of farmers.

Individually owned enterprise: The smallholders are cultivating their own individual fields and this is seen as key to success by them.

Whole enterprise planning: In Umbumbulu tractor and fencing donations have been positive in increasing productivity because these were made in the context of a whole production system plan and the greater enterprise.

Mobilising the youth: The youth are being slowly and pro-actively drawn into farming through the success of this initiative. This has positive social implications as youth turn to productive and personally challenging activities that generate income, pride and purpose.

Long timelines: the process of involvement has stretched over 6 years. There is still regular and at times intensive support on institutional issues, crop production, marketing and funding. The Ezemvelo case shows clearly that if you are going to get involved, get involved for the long haul – or not at all.

6.7 Makuleke – outgrower relationship

Cotton at Makuleke

The Makuleke JV outgrower arrangement between the scheme Management Committee and Noordelike Sentrale Katoen (NSK) was an attempt to grow cotton on 5 to 6 ha farms under pumped irrigation as part of the WaterCare and then RESIS programmes. NSK needed the cotton for its ginnery throughput. The institutional processes and arrangements were strong at Makuleke but the financial realities of low-value commodity cropping resulted in net losses or marginal returns. The operation could not cover its costs, partly (but not only) due to global price falls although it continued into its 3rd year effectively on NSK debt write-offs. The partnership provides two main lessons – a positive one on institutional processes and a warning on profitability of arrangements such as this, which are a key success factor. Interestingly, two farmers opted to not join the partnership arrangement and continued to plant maize and vegetables with relative success. Their market advantage would be undermined should more farmers switch to those crops. Success factors and lessons emerging from the Makuleke case are noted below.

Strong farmer leadership: A strong and representative Management Committee for the scheme provided leadership and cohesion to resolve complex issues that arose in negotiating and preparing the partnership. The MC has provided a vehicle through which NSK could negotiate with the farmers and establish the JV. It is not workable in a JV of this nature for the Commercial partner to deal with individual farmers either in the establishment or the management of the JV.

Independent facilitating agent critical: A key success factor to the formation of the JV is the significant influence of an independent facilitating agent (in this case private sector) in the establishment of a JV and the building of trust between the two parties. An independent facilitator, who is readily available to the local farmers and their committee and who can advise on institutional, financial and contract complexity is a critical success factor.

Institutional process: The Makuleke cotton JV provides a good model in terms of the consultation and facilitation process that led to its implementation. Even though the JV failed on a financial basis these are valuable lessons for all partnerships.

Financial model weak: The financial basis of the cropping plan was always weak even if the target cotton price remained stable and target yields were achieved. The income provided by commodity crops such as cotton, maize and wheat, even on 5 ha farms typical of Makuleke, does not seem justify engagement with commercial farming (see Volume 2 – Chapter 5).

Early success needed: The reduced yield and incomes impacted negatively on the enthusiasm and self-confidence of the farmers. Early success is important to build confidence among farmers and planning should maximise the likelihood of positive returns in the first year. The temptation to rush planning and planting at non-optimal times must be avoided. Strategies could include phasing to more manageable sizes, phased-out subsidies and intensive mentoring and support to the entire production cycle.

Use available momentum: The presence on Makuleke of an existing revitalisation initiative focussed on bulk water and farmer training created an environment for developing the JV. It is easier to build on projects where there is some existing parallel momentum than on completely new initiatives.

Loan finance from partner: NSK provided loans for substantial capital investment for the purchase of in-field irrigation equipment, the payment of electricity deposits and the purchase of production inputs. Without this capital investment and input loan financing support it would not have been possible for the farmers to operate the pumped scheme. The lack of any meaningful support from the Land Bank or any commercial banks for smallholder farmers is very concerning and places a major development constraint on the many smallholder irrigation farmers in South Africa. Financial support is likely to fall either on the commercial partner or on Government.

Possible success with bananas: Taking into consideration the positive institutional aspects of the partnership it is possible that the JV could have been successful if it had been based on a higher value and less volatile crop than cotton. One such crop for Makuleke may be bananas.

6.8 Noko – NGO Partnership

Centre pivot at Noko

The Noko enterprise is an NGO – farmers' Trust partnership between TRAC-MP (the NGO) and the Noko Trust. The case highlights a number of insights into mentoring type arrangements and the realities of farm size in particular. The NGO has played a key role in institutional development, ongoing conflict mediation support and crop production guidance through a professional mentor. The ability of the NGO, who is effectively perceived to be a neutral agency and dealing with regular conflicting situations, is very clearly a key success factor. The Noko case also highlights the harsh reality that of the 411 beneficiaries, only 1 is really farming at any scale on (30 irrigated hectares), while some 15 people earn a minimum wage or less. In 5 years there have been no dividends to beneficiaries as all income over the farm-manager's salary is reinvested into the farm.

Leadership and networking: The Noko Development Trust is characterized by the strong leadership and entrepreneurship of the farm manager and initiator of the project. The contacts that he is willing to establish and develop are crucial for the financial feasibility of the trust's farm. There is a strong case to be made for networking as a key condition for success.

NGO Partnership : The NGO partnership with the TRAC-MP and Makoena, the farm manager, has played an important role in three key areas; institutional building, conflict resolution and direct crop production support through mentorship. In addition they have facilitated funding with some collaboration with Government agencies.

Mentorship styles : The employment of experienced, senior white commercial farmers is a central part of the TRAC-MP mentorship approach, supported by training in management, finance and crop production. This has shown itself to be useful and is a relationship and mode of learning that is appreciated by the farm manager. There is a second informal mentoring relationship with a neighbouring white commercial farmer which has also been valuable and is complementary to the TRAC-MP mentor. What is of interest is the difference in personal approach. The one is straightforward and production oriented, the other is more developmental aimed at facilitating the farm manager's growth through mistakes and self-learning. This raises a caution when one is drawing on experienced senior white commercial farmers as mentors. The reality is that different individuals will approach mentorship with their own personal style tempered by a life of farming and dealing mainly with black people as farm labourers in a different context where they expected to follow instructions. If a mentorship approach is adopted along these lines, finding experienced commercial farmers who have the ability to work developmentally, or at the very least constructively in an interpersonal and socio-cultural sense, must be addressed explicitly.

Small returns from production: While Noko production levels are moderately good, it is acknowledged by everyone involved that profitability is small from year to year on the pump-irrigated commodity crops.

Conflict resolution and institution building: TRAC-MP has played a role in conflict management and institutional support over a long timeline of de-facto involvement. This involved training, mentoring and institutional re-design. Importantly, there was a need to separate the general ownership of the resource (ie. by the Trust) from the farm management committee. This autonomy of the farming operation itself resonates with the earlier motivation in this text that institutions should be created so that farming operations are handled distinct from collective water allocation

Long timelines of support: The mentoring role has extended nearly 8 years to date and is still central to ongoing success. Planning for long involvement seems to be a critical success factor, with emphasis on (but not exclusively) conflict mediation and institutional responsibilities.

6.9 Giba Communal Property Association – sharecropping with % management fee

Bananas at Giba

The partnership between the Giba Communal Property Association and the agribusiness company SA Farm Management, a subsidiary of the Boyes Group, is a case of a share cropping arrangement with potential for 709 ha of irrigated bananas. This arrangement is an effective handover of the productive assets (land, water, orchards, infrastructure) to a commercial partner for a 15-year period, who charges a turnover -based management fee and takes a cut of the profits. The benefits that are gained by the community are mainly in the form of direct employment. Even though the scheme is currently irrigating 150 ha, there are only 5 section managers employed (i.e. above minimum wage). The main learnings from the Giba case are that even workable, productive agricultural partnerships are likely to result in little more than employment as the primary benefit for the landholders.

Operational control of the project is wholly in the hands of SAFM for the 15-year period. They maintain operational control and full decision-making authority with beneficiaries effectively following instructions and ostensibly learning through the process of doing the work. The need for operational control is understandable from a commercial operation point of view but conflicts rather directly with ideas of empowerment and self-reliance, let alone that of the emerging farmer. This is a low risk approach on the part of the company and may be essential given the uncertainties of agricultural economics; what is key is that everyone understands and accepts this reality up front, acknowledges the implications from developmental and political perspectives so that it does not cripple the project at a later stage.

Basic employment benefit: The possibility of dividend payouts from the profit share arrangement is perhaps too early in the project to be fully assessed, but the case seems to show that expectations of commercial partnership benefits should in revitalisation planning be largely confined to secure employment at best. The Makuleke case, Hereford (Tapela, 2005) show they can result in losses for the farmers. A dividend payout – when spread between the 1680 beneficiaries is not likely to be significant. The partnership arrangement is in principle the same as the Tyhefu model (Case No. 5) in terms of control and autonomy, although the financial responsibilities, shareholding division and management fee in the Tyhefu arrangement seem rather more favourable for the partner and with lower risk than the Giba arrangement.

Skills transfer: There is a clear intention in the contract for skills transfer to take place as the process evolves, with increasing authority linked to skills growth. This approach has parallels with the Build, Operate, Train and Transfer approach used in the water and engineering sectors with some but limited success. There is a contradiction as higher skilled jobs in management are likely to require additional education outside of the workplace, not simply on-the-job training. Skills transfer mechanisms need to be practical and interrogated – stating that skills transfer will take place is not sufficient. The agreement fails to outline how skills development and empowerment principles will be implemented and assessed. It seems that the commercial partners' methods are assumed to be self-evident or successful beyond doubt. People will be trained in order to perform their business tasks better, but devolution or sharing of power (in their own business) is locked out.

6.10 Tyhefu – sharecropping with fixed management fee

The Tyhefu case, observed over the last 4 years is still unfolding, and has been prioritised for renewed funding by the Department of Agriculture for 2006/2007 financial year. The case presents a set of important issues that are likely to be found on many schemes in the country. These are particularly relevant to those schemes developed in the 70s and 80s under the homeland Government's modernist paradigm of development thinking (Van Averbeke, 1998).

Unused land at Tyhefu

These are characterised by large capital-intensive systems (pumps, pipelines, centre pivots and sprinklers) as opposed to the simpler flood systems that arose from the 1955 Tomlinson Commission. Tyhefu shows up three main lessons.

- First there is a need to recognise and resolve differences with the underlying land tenure from before the scheme construction.
- Secondly, there has been a clear but unfilled need for a facilitator to engage with the three parties and clearly communicate the implications of the partnership arrangement with the landholders. This facilitator also has to play a conflict resolution role.

- Finally, a lack of policy direction has resulted in a series of changed decisions on the part of the Department of Agriculture, some of them top-down and without any consultation of a long-serving Steering Committee who after R44 million rand[8] and 7 years still have no production to see from the investment. The partnership will at best yield jobs with a small dividend to the community.

Undercurrents: The events at Tyhefu between June 2005 and February 2006 highlighted the strong undercurrents that can remain unseen even though a thorough process had taken place on institutional development, financial planning and on developing a conducive environment for a commercial partnership. Differences around land rights show a need for astute and skilled sociologists who can gain insight into the deep seated and often invisible issues on which revitalisation plans can inadvertently or inappropriately be constructed.

Overlays of land tenure: There is a distinct form of tenure that is associated with the period before the introduction of the scheme, which is based on PTO tenure. When the scheme was constructed, new land rights were created based on the new layouts which are not in line with the underlying rights. Some of the original land rights holders claim to have lost their rights as a result of homeland government's top-down approach to implementing the scheme. Under the current circumstances it is not clear whose rights will prevail. The Ncora scheme and many others face a similar undermining land issue on which sound intervention strategies cannot be built.

Weak land rights enquiry: In 2004 a rights inquiry was conducted by service providers contracted by the Department of Land Affairs. The report only describes the current form of tenure rights without consideration of the underlying rights, which are currently at the heart of the arguments of the different factions. A clear opportunity to identify and resolve issues prior to collapse of the partnership was missed.

Facilitation needed: There was a clear need for an independent and skilled facilitator to engage with the three parties when the differences first arose publicly in June 2005. By its very nature, the revitalisation of an irrigation scheme is a multi-disciplinary effort. In all the years of activity and substantial investment at Tyhefu, there has been no single body or institution with sufficient skills, mandate or time to facilitate the whole process. The case of Tyhefu Irrigation scheme presents a classical case of a need for a neutral body that plays an overarching coordination role between parties

Civics and Tribal Authorities: The events at Tyhefu reflect the great difficulty of coordinating different role-players who report to different leadership and institutional structures. The tension between the civic structure and one of two tribal authorities overlaid on contested land is the crux of the frustrations that resulted in the failure of the partnership even before it commenced.

[8] *This does not properly represent the facts as R38 million was spent on a major pipeline extending the scheme. Some R6 million has been spent on irrigation infrastructure more directly but has not resulted in a functional water supply system due to institutional, operational and pumping cost issues.*

Institutional development lacking: While the institutional structures proposed in the partners business plan have been subjected to a long process of discussion among different stakeholders of the scheme, there are indications that the final institutional mechanisms have not been understood and fully accepted by all the parties concerned.

lack of clarity on policy: There does not seem to be coherent accepted policy or a framework on revitalisation of smallholder irrigation schemes in the province. The implications of the lack of a policy framework means that each government department or institution engages in such programmes with little regard for integration.

Talkshop fatigue: The local Project Steering Committee (PSC) has deteriorated to a powerless community representative structure, unclear about what decision making powers it has within the proposed partnership and in its relationship with Government. This results from government departments continually making decisions that impact on the scheme without a meaningful involvement of its representatives, or coordination through a single structure located at the scheme.

6.11 Conclusion on farmer support options

The documented experiences show that partnerships and mentoring arrangements with private sector agri-business, NGOs or academic institutions have real potential to meet some of the most difficult challenges in revitalisation. The critical gaps in finance, input supplies, crop production knowledge, farm management, marketing and post-processing can be bridged using some or a mix of these options on a scheme. While primary responsibility lies with Government to provide extension and advisory support to farmers, these alternatives can be explored in the absence of or in parallel with Government initiatives.

- **Commercial Partnerships:** The case studies show quite clearly that benefits for scheme plotholders in conventional commercial or strategic 'partnerships' are mainly in the form of opportunity to work as labourers and possibly a small dividend payout to the community. When these potential dividends are distributed to the usually large number of plotholders it is clear that the individual benefit is marginal beyond basic employment. The case studies and literature review show the need to responsibly limit expectations of the financial benefits to interested plotholders that might result from such partnerships.

- The **empowerment and training aspects of partnerships seems limited. S**ome partners contract up to 15 years indicating very long timelines to any handover of responsibility. Even those who contract for 5 years (with expected handover thereafter) do not present adequate detail on how skills transfer and management capability will take place. Issues of equity, representation, empowerment, financial benefit plus exit strategies leading to the proposed

handover are largely missing from existing practice and need to be clearly addressed. Partnerships therefore do pose a positive alternative and will on some schemes possibly be one of very few available (perhaps given high pumped costs or complex soils or distance to markets). Optimism on potential benefits to plotholders should be reserved initially to employment at a basic wage.

- **Conflict mediation:** The role of a neutral facilitating agent (either private sector, academic or NGO) emerges as a critical factor to provide conflict resolution interventions and institution building linked to partnership formation and functioning. Timelines of involvement in this neutral, mediating and advisory role need to extend up to 10 years.

- **Entrepreneurial farmer support:** NGO and private sector collaboration such as the one-stop shop approach of the Agri-business Centre case outlined earlier promotes entrepreneurs in a whole-enterprise framework. This is a functional and creative response to the real and widely variable needs of a wide range of farmers and may be useful to pursue on some schemes. Government involvement either directly or as a funder is a possibility for such one-stop support centres.

- **Academic partnerships:** A variation on the partnership theme is where irrigators have partnered with academic institutions which engage over extended periods in action research with schemes. These tend to focus on one component at a time (cultivar trials, socio-economics of plotholders, water allocation practices, etc.) but over time can cover a wide range of institutional, infrastructure, water, agronomic and marketing issues. These academic partnerships present promise for opportunistic ad-hoc support and there is evidence that they are responsive to more diverse farming styles than commercial partnerships can accommodate.

- **NGO supported extension services:** Experiences show that the conventional extension service approach (but run by an NGO) using trained extension officers does work in supporting individual irrigation farmers. This experience can be translated to a scheme-specific extension service where either, privately funded or government extension officers could be specifically trained to meet the information transfer needs on a scheme. The Needs-Based Farmer training approach can be used in direct support of this approach.

- **Market Information Systems:** Accurate market information is necessary for the success of any agri-business venture, particularly given risk and fluctuating market conditions. Farmers need to make informed decisions about crop selection, marketing strategy and timing. Access to updated market intelligence and market information systems provides the essential basis for decisions that will generate profits. With the absence of agricultural marketing boards in South Africa, the information gap on how agricultural markets behave is filled by private sector and research organisations. These typically publish weekly, monthly and annual market reports which improve the decision making capability of farmers. This is a critical element in the chain of activities that lead to successful irrigation farming.

chapter 7 route map

7.1 Recap of the main points

It is expected that using the Rough Guide and selecting and modifying the approaches to the realities of your specific irrigation scheme, will lead to a set of practical routes for revitalisation. The main points in each chapter are summarised below.

chapter 1 principles and objectives

The **principles** of how we engage with people and how we think set the stage for more successful outcomes. Respect, profitability, participation, community control and an acceptance of widely diverse needs on schemes and between schemes are some key themes. **Objectives** must be interrogated so that the full meaning of catch phrases (poverty alleviation, food security etc.) are crystal clear and agreed by all involved in the planning and implementation process.

chapter 2 challenge your thinking

Four broad farming styles have emerged from the theoretical and case discussions detailed in Volume 2, which will guide the formulation of the strategic plan (on an ongoing and dynamic basis). These are:

- the '**smallholder'** (lower risk approach, diversified crops, smaller plots, needs lower water costs – typically on flood and smaller schemes)
- the **'business farmer'** (larger plots, more externally oriented with cash focus, farming is main income, needs land leasing efforts)
- the **'food producer'** (intensive food gardens with rainwater and greywater harvesting off-scheme, stimulates land-leasing, hits poverty)
- the '**equity labourer'** (commercial partnership arrangements, JVs and sharecropping, main benefit is basic employment, esp. schemes with high costs)

The aim is to use the consultative diagnosis and planning methods (SMILE and ICON) to **generate scenarios of future scheme land-use and farming styles**. Choice and practicality of farming styles will be influenced by the existing farmers willingness and interest, by infrastructure limitations, repair and running costs and opportunities for farm production support and marketing. A mix of farming styles can co-exist on any scheme. Initiation of a land-registration / leasing process is central to the 'business farmer' and the 'equity labourer' styles.

A case is made for separating the **water-related institutional functions** (rules of scheme operation) from the more varied, dynamic and necessarily opportunistic agricultural production organisational and support elements. Excessive institutionalisation of the agricultural production elements (input sourcing, marketing, etc.) can throttle individual enterprise and profitability.

Multiple use of water as a concept extends development impact and creates synergies to the benefit of the scheme users and the broader community, including water harvesting for food production and the link to promoting a land-leasing market.

Conservation agriculture is one of the innovations that can be introduced (mainly to 'smallholders' and 'business farmers') to lower their risks and reduce their cash flow requirements by cutting down on input costs. A small-step approach, where reduction in mechanisation or reliance on external inputs is made in increments may be a useful transformation strategy. Conservation agriculture is implicit in the food producer approach of deep-trench beds and diversified, intensive production.

chapter 3 revitalisation process

- highlighted the importance of understanding **representation** and institutional structures at an entry stage, not to change this, but to ensure full participation for those outside of existing structures.

- The necessity for institutional clarity (i.e. clear and enforced rules of engagement) in regard to the water management, infrastructure and land tenure is critical to reduce institutional uncertainties. This will allow a shift in farming behavioural change where greater risks are accepted and greater returns can be achieved.

- **success and failure factors** to guide concept formulation stress whole enterprise planning covering each and every aspect of the irrigation and farm production system, and investment in human capital almost equal to infrastructure costs.

- a cautionary note on the problems of **budget driven interventions** which result in wholesale emphasis on capital investment and have time for little else that is critical for sustainability, ownership and success.

chapter 4 feasibility planning

Introduced a range of **participatory approaches** for diagnosis, scenario building and project evaluation. These included SMILE and the ICON Irrigation Feasibility Planning Approach. The **financial and economic** basis for decision-making was explained.

Chapter 5 land exchange strategy

The motivation behind the need for a land-exchange process on the schemes is outlined and the link to off-scheme farming (food production) support is explained. A methodology to establish a **land register** and quasi-legal land leases is presented.

Chapter 6 farmer support strategies

A range of practical examples and tools are briefly described which can be used in a mix, copied or modified to provide the necessary farmer support to the one, two, three or four farming styles emerge from the scheme planning process. These include:

- Dynamic, **needs-based farmer training materials** for extension officers are recently available from the WRC, with detailed training materials that are PAETA registered. Given the range of content at present, these materials are probably best suited to green and dry maize production for 'smallholders' and medium value crop production for 'business' farmers.

- The **One-stop Agri-business Place**, is an approach based on a proven and successful resource centre case in South Africa, which provides an accessible and dynamic mix of input, production, institutional, finance, information and marketing services. This could be funded by Government or a mix of funding with NGO or private sector input.

- **Privately or NGO managed extension officers**, re-trained for the specific irrigation support task and in turn supported by a central group of sectoral experts has been successful in KZN. The 'extension units' are supported with transport, current information covering production, technical and marketing elements and actively engage with farmers on an ongoing basis. The primary service is live information and support to mobilise development funds. This approach could be tailored for any specific scheme but is only as strong as the management and information centre that underpins it.

- **Mentorship** type farming partnerships with NGOs and professional mentors which provide key support to crop production knowledge streams and conflict resolution to institutions and groups. These mentors are typically successful farmers from the commercial sector engaging full or part-time with emerging farmers. Individual personality and style largely determine success, empowerment and skills transfer.

- **Academic** partnerships, where ad-hoc and targeted research interventions can accumulate momentum and cover increasing scope on a single scheme over time, as well as provide a neutral party to mediate and link to external agents.

- **Commercial** partnerships, which can provide critical finance unavailable from any other source, as well as a wide range of production support and market. Potentially limited by profitability but can and will play a role on some schemes, particularly expensive and complex ones. Benefits to farmers are often limited to basic employment, mainly due to the large numbers of plotholders and the relatively small return per irrigated plot.

7.2 Planning for sustainability – info sources and options

There are a number of ways of categorising the system that is a functional irrigation scheme. Backeberg (2002) proposes eight "pillars for successful development" which are required for sustainability. These are presented in Table 7.1 to comment on the availability of existing information to inform revitalisation planning and implementation. This is a subjective evaluation and is attempted to generate a broad picture where the most challenging areas of project revitalisation design are likely to be located.

An availability rating from 1 to 5 is made which indicates the availability of relevant information that any agency be able to access in trying to plan and implement revitalisation programmes on smallholder schemes in South Africa. These will guide you to relevant sources of information to cover the eight key areas.

Table 7.1 : Information Sources for strategy formulation and project implementation

Requirements for Sustainable Irrigation (Note 1)	Info. Availability Rating (Note 2)	TOOLS Source	Comment on availability of guiding information
People Knowledge Base • Entrepreneurial spirit • Experience • Management skills • Demographics • Leadership	1	• Agribusiness Place • WaterCare Management modules (unpublished[3]) • NGO partnerships • Mentorships • (NGO) "Extension Units"	Any agency intending to promote entrepreneurial skills in the smallholder agric. sector, or gain access to existing experience and lessons of leadership will be hard pressed to find substantial documentation, or guidelines on the subject. Work by the Agribusiness Place and the late stage Water Care initiatives seem best options to input and details on. Alternatively develop own material in consultation with experienced people. Mentorships and 'informal' partnerships will play an important role here.
Institutional arrangements • Land tenure • Water rights • Legislation • Water User Associations • Farmer Organisations	3	• WaterCare Management modules (unpublished[3]) • RoughGuide • Land Leasing Methodology	Information from international experience, published by IWMI, DFID as well as local experience in WRC and Water Care is readily available to inform plans and action related to institutional and organisational development. Conventional approaches with attention to notes in Volume 2 is acceptable.
Climate and natural resources • Rainfall, temp, evap, etc. • Soils suitability • Rotation and grazing • Crop water requirements • Current / traditional practices	5	• Agricultural Research Council • Standard databases	National databases of soils, hydrology, heat units, crop suitability, etc. are available in substantial detail to be augmented by site investigations. SAPWAT is well established for crop water use. Resource evaluation is readily defined given available information.
Economic location / factors • Markets for inputs/produce • Quality and grading • Timing of delivery • Price fluctuations and trends • Risk of demand change • Economic sustainability	2	• Agribusiness Centre type centralised market • Cellphone marketing • Professional mentorships • other NGO partnerships • Contract farming	The evaluation and analytical tools of markets, pricing, risk and demand are well developed in the commercial sector. However, the translation from analysis to implementation plan has a glaring absence of guidelines and research to inform supportive planning and action. This is expanded further in the text, but most agencies working with smallholders find this aspect critical and difficult to resolve.

Requirements for Sustainable Irrigation	Info. Availability Rating	TOOLS or Resource	Comment on availability of guiding information
Infrastructure and technology • Storage and bulk water • Irrigation system • Transport (roads) • Communication	5	Standard and accessible	Appropriate irrigation technology manuals and design guidelines are well documented and available, both internationally, but also specifically in the South African context (WRC, ARC, IMWI). Site specific information on systems is readily obtainable and with the available guidelines, intervention plans can be made.
Financial services • Availability of equity capital • Access to credit • Loan options • Interest rate trends • Loan security requirements • Grants and subsidies	2	• Government partner • Commercial partner invests • DWAF – Agric water use subsidy • NDoA – CASP funding • District Municipalities	There are nearly insurmountable challenges to securing any financing from banks who require formalised land tenure as collateral. The actual amounts needed for production and rehabilitation are often in excess of DWAF or CASP allocations. (Makuleke partnership had no other choice due to lack of government funds).
Feasibility evaluations of farming systems • Crop and livestock budgeting • Capital cost budgeting • Production cash flow • Objectives of enterprise • Incentives for investment • Employment opportunities	5	• SMILE diagnosis and scenarios • ICON feasibility planning • Partners / mentors give input	The process of feasibility studies, both technical and financial is well established and applies as well to the smallholder sector as it does to commercial agriculture. However, the smallholder sector demands a consultation process that is considerably more complex, but is one that has been well explored through research and is documented. A range of approaches for concept planning, consultation and feasibility evaluation are available to guide agencies and farmers (SMILE methodology, the ICON approach, WRC guidelines, RESIS pre-development survey amongst others).
Agricultural support services • Extension and Training • Station and farm research • Agribusiness services, Co-ops and depots • Suppliers and maintenance • Access to social services • Farmer Associations	3	• Lima extension approach • Agribusiness Centre approach • Commercial Partners • Mentors • Agricultural Research Council • Academic partners	Strategies for the provision of support services are neatly divided between those supplied by Government and NGOs and those provided by the private sector. The **content and nature** of agricultural support services that are needed are well understood. However, practical and financially viable options for securing extension, mechanisation and input supplies present real challenges for most agencies involved in trying to catalyse the development process. Practical solutions and examples are available as shown – either outsource these, or emulate them.

Note 1: Eight key requirements taken from Backeberg (2002) with minor amendments to wording and content.
Note 2: A score of 5 means that a large body of relevant published work is thought to be readily accessible.
A score of 1 means that very little relevant and guiding work is thought to be accessible.
Note 3: These modules are prepared by WOMIWU Rural Development (Polokwane) and are planned for formalisation into institutional development guidelines for smallholder irrigation schemes.

Conclusion

The whole approach outlined in the Guidelines is driven by the hopes and aspirations of scheme participants and brought to reality by a set of technical and financial boundaries. The development of the strategies for irrigation revitalisation is based on four groups of farming styles which can all co-exist on any one scheme.

After the first round of cost estimates, crop budgets and financial evaluations it will become clear which of these farming styles can co-exist on a scheme. Financial realities of feasibility and viability will somewhat dispassionately dictate the baseline of profitability and to some extent the crop mixes that will give sufficient returns. By composing these four theoretical farming styles a suite of strategies is formulated to meet their general needs. These needs are sufficiently distinct so that they must be catered for with different strategic packages. Once the project reaches implementation the actual plan that is formulated on these broad typologies will contain all of the main elements that are necessary to flexibly meet the more real and diverse needs of each group. The theoretical farming styles allow practical early decision-making in the planning process regarding the general nature (mix of styles) of the scheme development, which otherwise gets overwhelmed by diversity or is simplified to death by generalisation.

Running costs play a significant part in the gross margin evaluation and the scheme technology, size and condition is likely to split farmers into 'smallholder' and 'business farmers' fairly clearly, which in turn will lead to optional land and production support strategies. The makeup of these will hopefully be inspired by some of the ideas presented in the Guidelines or perhaps by direct communication with some of the programmes which are briefly outlined. Cross visits, brainstorming sessions, outsourcing of components, emulating and modifying while learning through process cannot be defined in the guide. It is this very dynamic and fundamentally supportive process to the range of farmers themselves (and whichever formal or informal partners they may choose) that is the pivotal role of the person or team driving the revitalisation process.

To simply say revitalisation is possible or that it is impossible denies the spectrum of people, skills, infrastructure, climate, market, history and opportunity that is out there on the hundreds of schemes in the former homelands. You may face the unpalatable fact that some schemes, because of their inappropriate technical designs, their position relative to centres and markets cannot arrive at a feasible plan that justifies investment. This is not unlikely and it will take courage to fully explain the analysis to scheme participants and to politicians and stick to realism with patience and clarity.

More optimistically, it is hoped that this guideline will assist in finding those elusive routes that even though they might be rough, will make the journey and the outcomes worthwhile.

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