Revitalisation of Smallholder Irrigation Schemes – (RESIS) in Limpopo Province

Pieter de Witt Pr Eng
Introduction

• Kofi Anan 25 May 2010: 265 million people in Africa have food shortages.
• In Africa more than half of the people are dependant on agriculture for an income
• Africa has to improve production to feed ourselves and export to the rest of the world
Limpopo province

• Annual rainfall of 450 mm
  – highly seasonal
  – thunderstorms
• Hot and dry climate
  – High temperatures
  – Low humidity
• Low production with dryland production
• Irrigation schemes are prime targets to lift production
Aim of this Presentation

• To make Engineers aware of the other disciplines involved in developing irrigation schemes

• To report on what we are doing in Limpopo to support Smallholder irrigation schemes
Current situation

- 126 smallholder irrigation schemes were developed 40 years ago
- Properties:
  - Communal land with No secure land tenure
  - At best permission to occupy (PTO)
  - Small allocations (1 to 5 ha)
- Infrastructure not maintained
- Only 30 % of fields planted
Canal not quite in use
Most fields are lying fallow

Photograph by Jonathan Denison
Community uses for canals
Reasonable production on some schemes

Photographs by Jonathan Denison
Not efficient irrigation
Limited Marketing opportunities
Aim of Revitalisation

• Provide infrastructure to enable: PROFITABLE and SUSTAINABLE PRODUCTION
Ground rules

• Revitalisation of smallholder irrigation schemes is a social development with input from engineering.
• The production plan and the preferences of the farmers inform the infrastructure requirements.
• Engineering is a service provider to revitalisation, but does not own it because they spend the money
Role of Engineering Services

Development Model
Engineering Tasks

- Training on Infrastructure
- Advice on Maintenance
- Evaluation of Performance

- Preliminary Design Survey, Design, Specifications, drawings

- Contract Administration
- Construction Supervision
- Measurement of works

Sustainable Production
Planning
Implementation
Infrastructure

• Bulk water systems
• Grid electricity connection
• Storage dams
• Soil conservation structures
• Roads
• In-field irrigation systems
Proper Engineering Standards

- Soil investigation: only class I and 2
- Proper run-off control planning
- Crop water requirements (informed by the production plan)
- Pumps and distribution systems design
- SA Irrigation Institute standards (sabi.co.za)
River pump station and canal
Storage dam relined
Pumps installed
In-Field systems

- Type of system is dependent on crops and site specifics
- More crop per drop (Efficient systems)
- Automated (To attract commercial Strategic partner)
- Field crops
  - Center pivots
  - Overhead sprinkler
- Orchards or vegetables (limited on RESIS schemes)
  - Micro or drip irrigation
Design showing 10 pivots
Makuleke potato crop under irrigation
Second crop at Makuleke
Challenges Land lost on corners
Center pivot smaller than 10 ha
Overhead Sprinkler system
Dry bean crop
Floppy not floppying
Supply pipes easily damaged
Homu drip irrigation Hydrant
Peppedew under drip irrigation at Homu
Challenges
Fire damage
Conclusion

• Proper engineering do assist profitable and sustainable production
• The social processes are most important
• Land tenure to be secured
• Ownership of infrastructure is crucial to limit vandalism
• A holistic view is necessary
Community meeting
Vandalism
Closing remarks

• Does current best practices such as Conservation Agriculture and renewable energy get enough attention?
• The End