

# Brief history of alluvial water use in arid southern Zimbabwe

Special session - WaterNet Conference

Annelieke Duker

25<sup>th</sup> of October 2017

Swakopmund, Namibia



# Mzingwane Catchment



BULAWAYO

Location



MZINGWANE

## Legend

- Gauging Stations
- ~ Rivers
- Cities
- Service Areas

### Subcatchments

- Lower Mzingwane
- Mwenezi
- Shashe
- Upper Mzingwane
- Boundary

0 10 20 30 Kilometers



A wide, dry riverbed in a semi-arid landscape. The riverbed is composed of light-colored sand and gravel, with some darker patches of soil. The banks are low and sandy. In the background, there is a line of green trees under a clear blue sky.

## Thuli River:

- Up to 250-300m wide
- Approx. 8-9m deep

## Shashe river:

- Up to over 800m wide
- From 4 up to 20-30m deep
- Matabeleland South, Zimbabwe

## Water use

- Domestic, livestock
- Communal irrigation schemes:
  - Functional and dysfunctional; rehabilitated and modernised
  - Crops, technologies developed, markets, challenges
- Individual farmers: commercial and smallholder



## Three systems: from diesel to solar

- Established in 1960's
- Ranging from 25-65ha
- Maize, wheat, beans, some vegetables
- Started with strong government support (O&M)
- Diesel engines and well points
- Canals and flood irrigation





- End of 1970's: reduced inputs and systems degraded
- Flood in 2000 washed away most engines in 2 systems
- Interventions by farmers, NGO's and government
- Fluctuating productivity of the systems over time





## Dysfunctional systems



- Not is use at all
- Supplementary irrigation in rainy season



# Submersible pumps installed







- Three irrigation systems
- Community services





# Rehabilitation







## Shashe: modernisation





- 90 ha citrus under pivot
- 40 ha under staple crops
- Manager appointed by farmers
- Contract farming





## Diversity in individual farmers - abstraction



- Diesel/fuel pumps
- 0.2 – 4ha









# Irrigation methods

- Experimental
- Home-made sprinklers, flood
- Vegetables, maize, fodder





# Commercial farmers






# Diesel pumps with reservoirs





# Challenges

-  Water?
- Energy, Energy and Energy:
  - Diesel/fuel: access to diesel, skills and money to repair diesel pumps, dependency on donors or government
  - Electricity: frequent power cuts, dependency on
  - Solar: technology still under development, frequent power outages, dependency on others, uncertainty for farmers
- Pumps: washed away
- Markets: over-supplied, distance, transport, storage, knowledge on prices, who decides on the crop choice, testing new crops
  - General shift to fodder crops (better prices, demand higher, perennial income)



## Looking ahead

- PhD research on evolution of communal systems and individual farmers in order to:
  - Learn from how farmers adopt and adapt technologies in areas with unpredictable weather and volatile markets
- A4Labs project:
  - how to better make use of the large potential of alluvial aquifers for improving livelihoods
- From 2018: new NWO-funded project “Nature-based water infrastructures in Ethiopia and Kenya for #GlobalGoals” (NaBWIG):
  - Enhancing resilience of small farmers through innovations in nature-based storage



A wide, dry riverbed with a person standing in the middle for scale. The riverbed is composed of light-colored sand and silt, with some darker rocks scattered throughout. The banks are lined with green trees and vegetation. The sky is clear and blue.

Questions, suggestions, ideas?!?!

Contact: [a.duker@un-ihe.org](mailto:a.duker@un-ihe.org)  
Website: [a4labs.un-ihe.org](http://a4labs.un-ihe.org)



# Discussion

## 1. Opportunities for learning:

- Understand the source
- Abstraction technology
- Sustainable use

## 2. Way forward:

- Community of practice?
- Synthesis paper?
- New projects?



