

# Development of Reconciliation Strategy for Luvuvhu & Letaba Water Supply System

## STUDY PROGRESS



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# Layout

- Background
- Completed Tasks
- Tasks in process
- Tasks still to commence

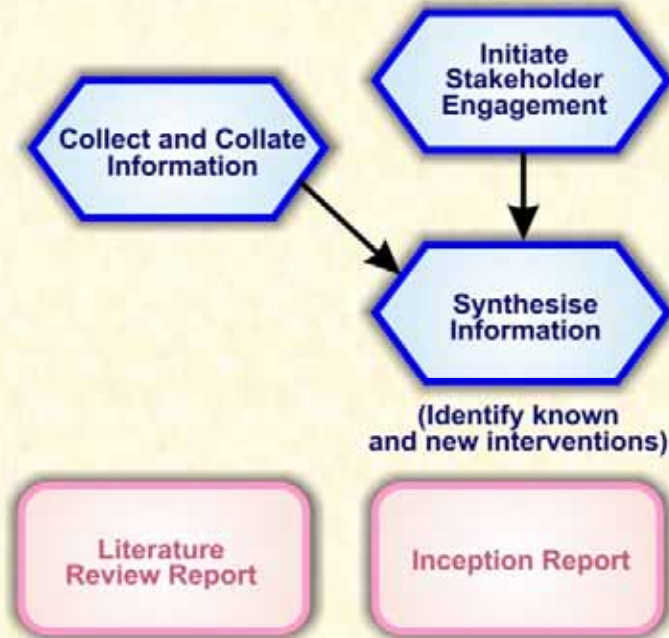


# Study Tasks

- **Inception , summary of previous and current studies (1)**
- **Preliminary screening workshop (2)**
- **System Analyses (3, 8, 12, 13, 14)**
  - Hydrological, Yield (WRYM), Planning (WRPM), Water quality
- **Water use and needs (4, 7, 9, 11)**
  - Requirements and return flows, Invasive alien plants, Reserve, International obligations
- **Intervention option (5, 6, 10, 15, 16)**
  - WC/WDM, Water re-use, Schemes (surface and groundwater), Social & environmental assessment
- **Formulation of scenarios to inform strategy (17, 18)**
  - Final screening workshop
- **Stakeholder engagement and public participation (19)**
- **Study Management (20)**



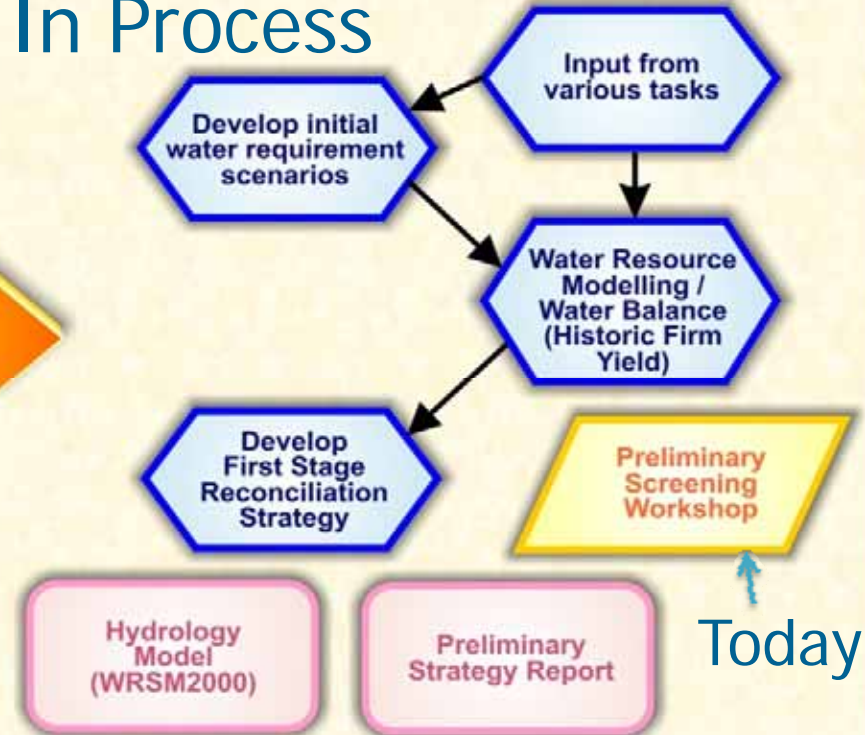
## INCEPTION PHASE



Completed

## PHASE 2: PRELIMINARY STRATEGY

In Process



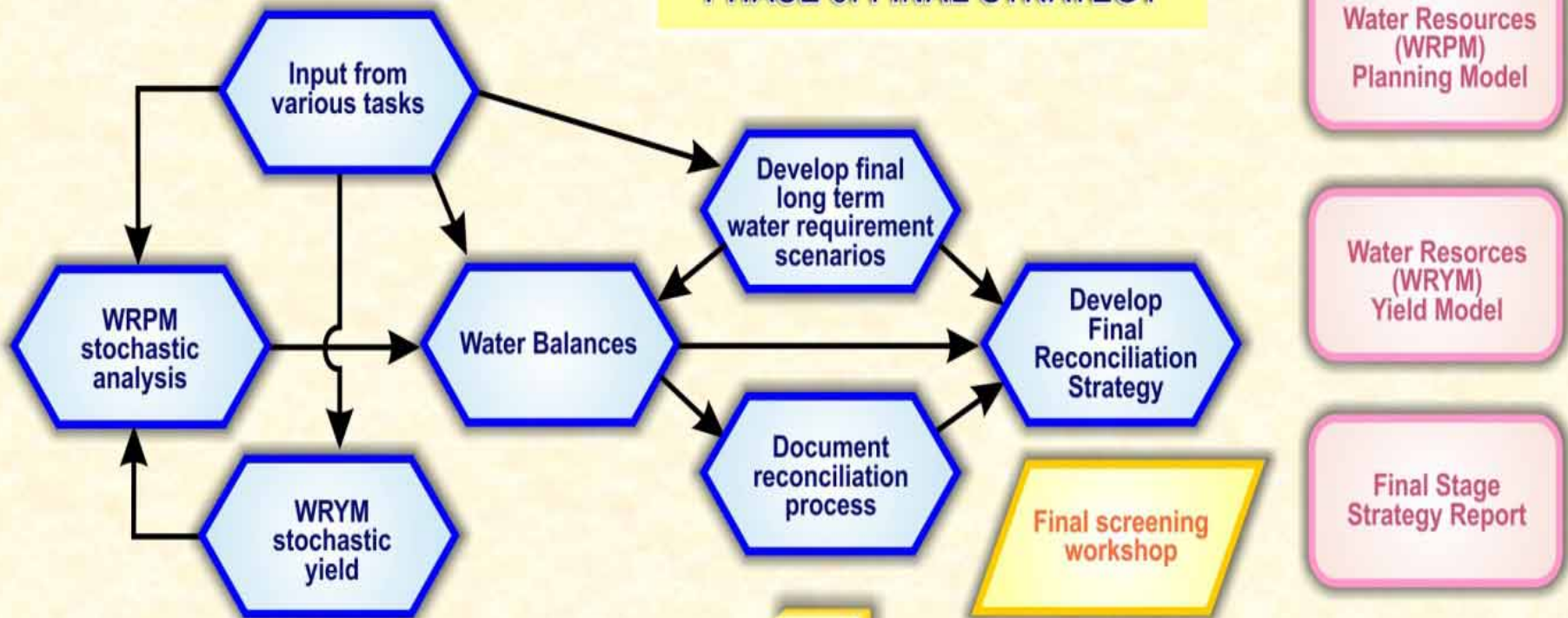
Today

## PHASE 3: FINAL STRATEGY



## PHASE 2: PRELIMINARY STRATEGY

## PHASE 3: FINAL STRATEGY



## PHASE 4: STUDY TERMINATION



**TASKS COMPLETED**



# Inception Phase

- Information from Tasks i,1 & 2
- Consultation with Client and liaison with key stakeholders, Local PSPs
- No additional tasks were defined
- Preliminary reconciliation strategy moved to after the completion of hydrology & initial yield analysis
- Irrigation data from Validation data suspect – may influence execution & completion time
- Deliverable: Inception Report





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DIRECTORATE: NATIONAL WATER RESOURCE PLANNING

DWA Report Number:

## Development of a Reconciliation Strategy for the Luvuvhu and Letaba Water Supply System

### INCEPTION REPORT



**FIRST DRAFT**

*February 2012*

WRP\_AS001\_Admin\_Front\_Covers\_2012\_FC1018.pdf  
Last updated: 2012/02/01  
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# Draft Inception Report



# Reports listed in Inception Report

Report no.	Name or description	Associated task
1	Inception Report	0
2	Literature Review Report	1
3	Water requirements and Return Flow Report (Also include a section on the International obligations)	4 & 11
4	Rainfall analysis report	3
5	Hydrology report (includes IAP)	3 & 7
6	Water Conservation and Water Demand Management Report	5
7	Water re-use report	6
8	Water Quality Assessment Report	8 & 13
9	Groundwater utilization scenarios	10
10	Preliminary Reconciliation Strategy (or first stage) Report	17a
11	Executive Summary of Preliminary Reconciliation Strategy Report	17a
12	Yield Analysis Report (Includes IAP & EWR)	12 & 9
13	Planning Analysis Report	14
14	Water Supply Schemes Report & Social+Envir Aspects)	15 & 16
15	Final Reconciliation Strategy reconciliation strategy Report	17b
16	Executive Summary of Final Reconciliation Strategy reconciliation Report	17b



# Summary of Current & Previous Studies (1)

- Briefly describes past reports
- Capture relevant information for current study
- Prepare list of augmentations schemes, intervention and bulk infrastructure options
- Deliverable: Report - main sections
  - Summary of Pertinent info from past reports
  - Synthesis of available information (main catchments)
  - Identified augmentation/Intervention options (list of tables summarised info)



# Summary of Current & Previous Studies (2)

- Reports from 26 different studies obtained
- In total in excess of 200 reports were covered
- The list of possible intervention options accumulated to 28 possible options





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## LITERATURE REVIEW REPORT



**FIRST DRAFT**

April 2012

# Draft Literature Review Report



# **TASKS IN PROCESS**



# Preliminary screening workshop (2)

- Present summary of information
- List all schemes and options – statement on feasibility
- Obtain consensus on:
  - Options to evaluate
  - Level of further investigations
- Updated water balances (indicative)
- Deliverables:
  - Workshop starter document
  - List of intervention options to investigate current study



# Study Tasks in Process

- Preliminary screening workshop (2) 60%
- Hydrological analysis (3) 30%
- Water Requirements and Return flows (4) 33%
- Water Conservation and Demand Management (5) 32%
- Water Quality (8) 15%
- Yield Analyses (12) 10%
- Review Schemes and Update cost estimates (15) 15%
- Stakeholder Engagement and Public Participation (19) 27%
- Study Management (20) 22%



# **TASKS STILL TO COMMENCE**



# Study Tasks no progress

- Honouring International Obligations (11)
- Water Quality Modelling (13)
- Planning Analysis - WRPM (14)
- Review or Assess Social & Environmental Impacts (16)
- Assembly of Information and Formulation of Scenarios (17)
- Final Screening Workshop (18)
- Study Termination (21)



# Thank You



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# Development of Reconciliation Strategy for Luvuvhu & Letaba Water Supply System

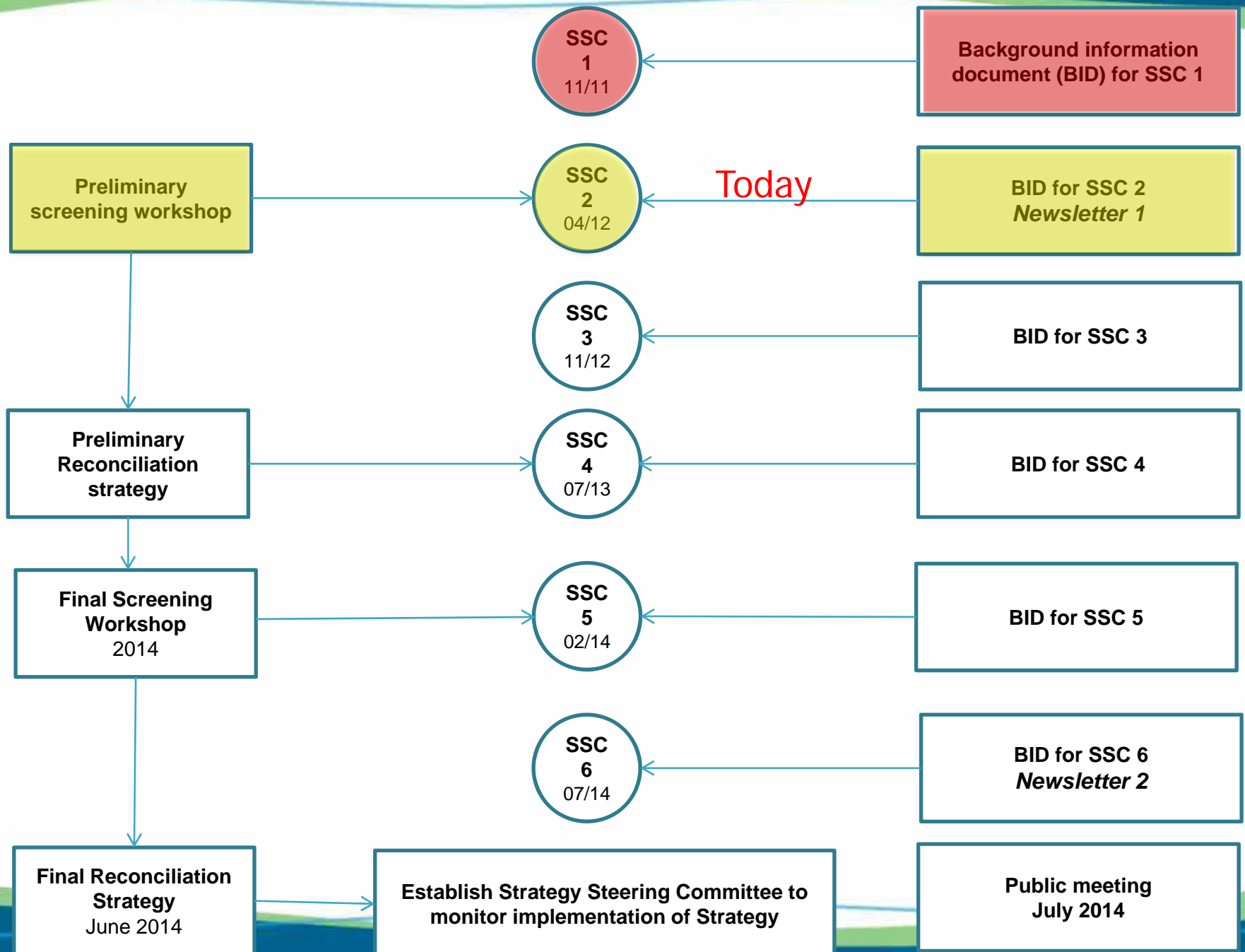
## STATUS AND RECAP SINCE PREVIOUS MEETING



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# Current Status

- Inception Phase completed
  - Inception Draft Report
  - Literature Review Draft Report
- Study website active
- Phase 2 Tasks in process



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# Development of Reconciliation Strategy for Luvuvhu & Letaba Water Supply System

## SCREENING WORKSESSION (Intervention Options)



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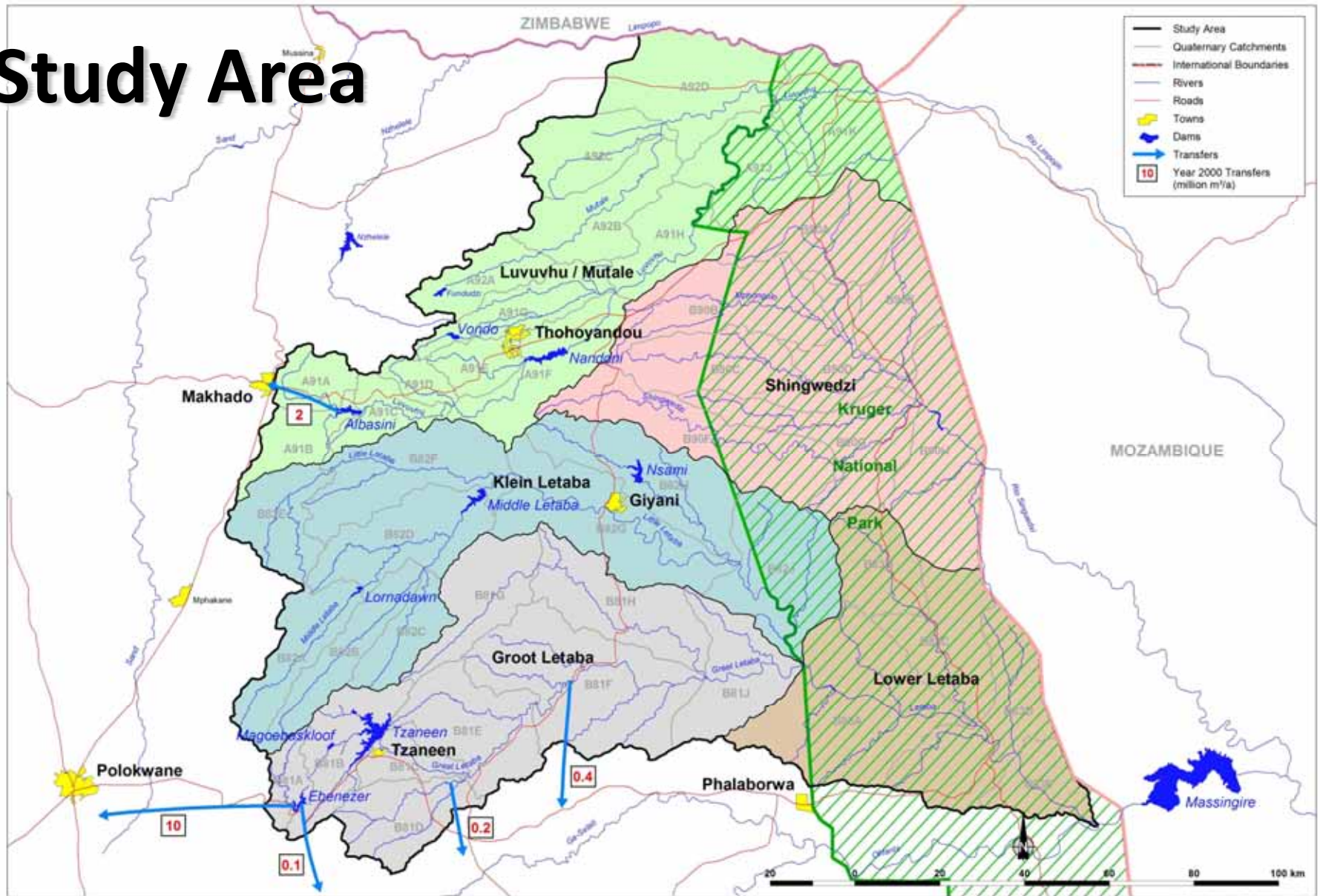


# Layout

- Introduction & Background
- Intervention Options from Previous Studies
  - Luvuvhu Main basin
  - Mutale River basin
  - Shingwedzi River basin
  - Groot Letaba River basin
  - Middle and Klein Letaba River basin
- Discuss Water Management Issues



# Study Area





# Methodology Overview

- **Select options / intervention measures from reports**
- **Prepare starter document**
- **Preliminary Screening Workshop**
- **Identify the advantage and disadvantages of each based on current knowledge**
- **Undertake strategy level comparisons of alternatives:**
  - **Costs**
  - **Environmental and socio economic impacts**
  - **Engineering feasibility**
  - **Yield /demand reduction**
- **Formulate scenarios to supply water requirements until 2040**
- **Preliminary Reconciliation Strategy**



# Purpose of Preliminary Screening Work Session

- Present and discuss the list of intervention measures as obtained from previous studies
- Adding additional intervention options
- Select the options / intervention measures to be evaluated as part of the Preliminary Reconciliation Strategy
- Obtain Consensus as SSC on:
  - Options to evaluate
  - Level of further investigations
- Deliverables:
  - Workshop starter document
  - List of intervention options to investigate in current study



# Typical Interventions

- **Management interventions:**
  - Water Conservation and Water Demand Management.
  - Optimal system operation.
  - Adjusting assurance of supply.
  - Trading of water use allocations.
- **Infrastructure developments:**
  - Water re-use
  - Augmentation Schemes
    - Surface
    - Groundwater

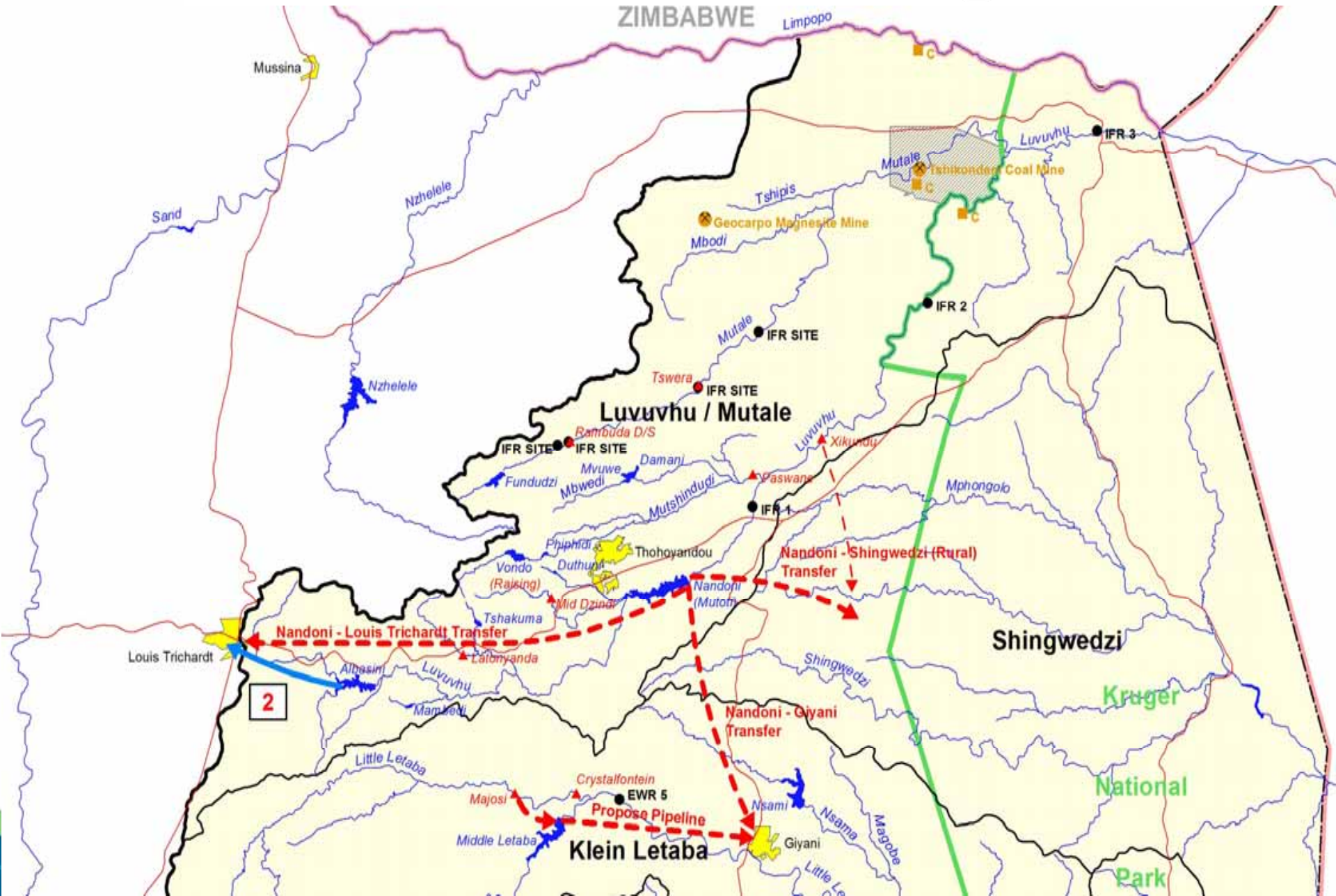


# Interventions Applicable to All Systems

- **Water Conservation and Water Demand Management (WC/WDM)**
  - **Urban, Rural domestic**
    - Review WC/WDM strategies of key WSA
    - Determine realistic potential savings, cost estimations & implementation program, Review after 18 months
  - **Irrigation**
    - Present & past water use efficiency
    - Potential benefits of WC/WDM
    - Modus operandi for WC/WDM implementation



# Luvuvhu Mutale Shingwedzi





# Luvuvhu Catchment Status

- Albasini Dam is over allocated, even if Louis Trichardt is supplied from Nandoni Dam.
- Vondo, Nandoni and Tshakuma sub-systems supply overlapping demand centers.
- Nandoni Dam to support transfer to Giyani.
- Water needs exceed yield of Nandoni by 2018.

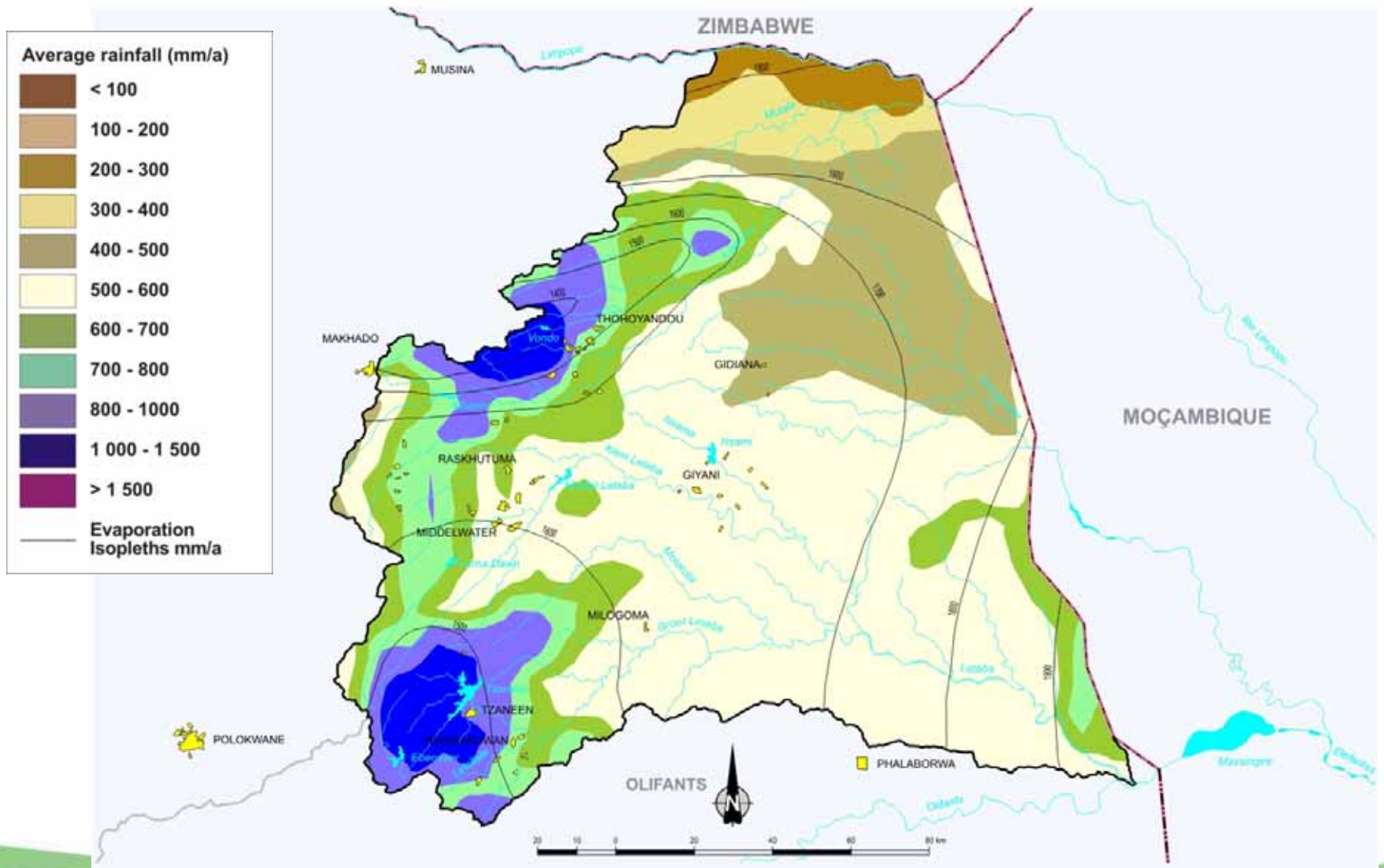


# Luvuvhu Catchment Options

- **Reconsider supply to Louis Trichardt from:**
  - Lu1: Albasini Dam in combination with Latonyanda Dam & other interventions.
  - Lu2: Nandoni Dam as primary source.
  - Lu3: Nandoni & Albasini (combination of above).
- **Lu4: Utilising groundwater in Nandoni supply area**
- **Lu5: Raising of Vondo Dam**
- **Lu6: Mid Dzindi Dam**
- **Lu7: Latonyanda Dam**
- **Lu8: Paswane Dam**
- **Lu9: Xikundu Dam**

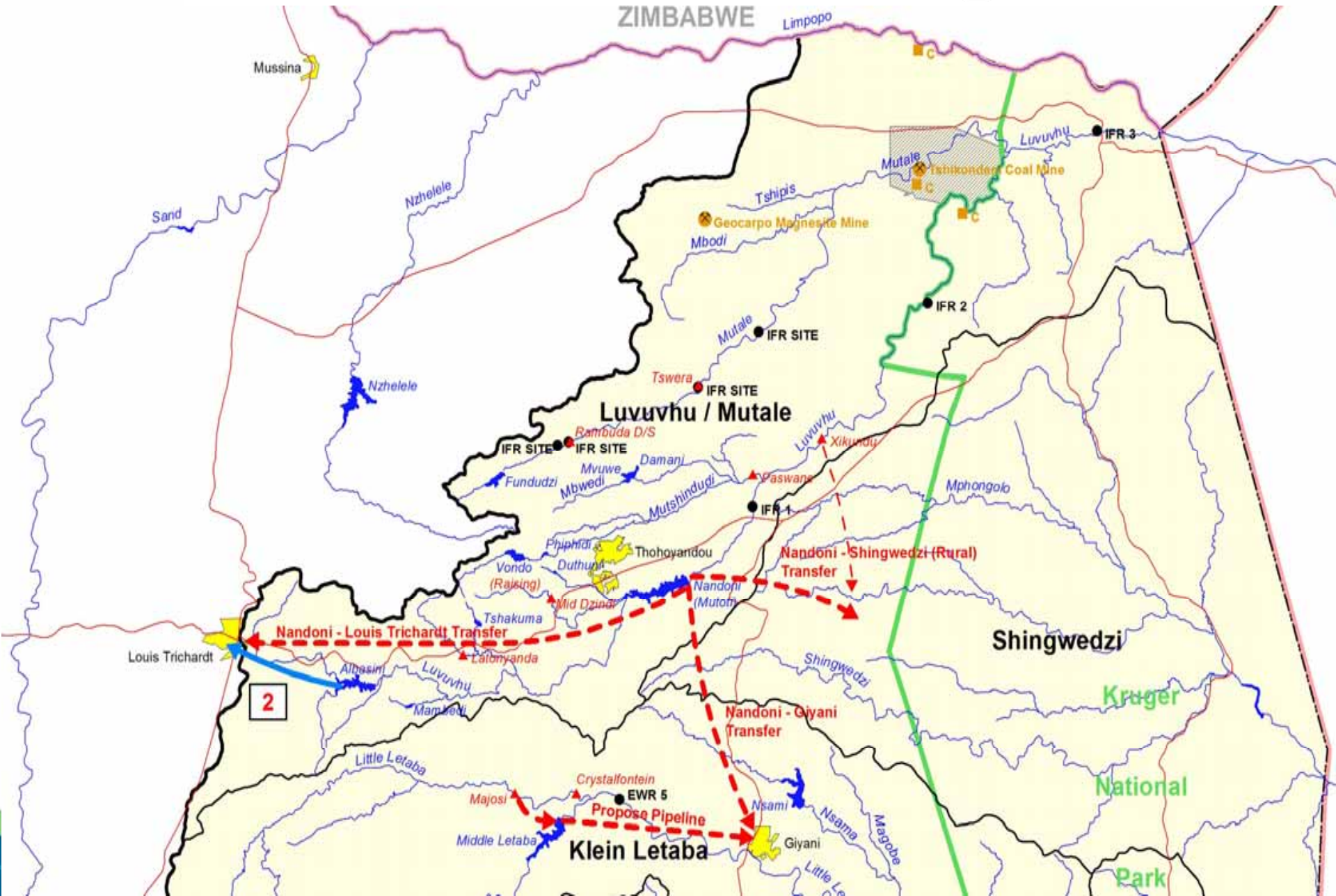


# Rainfall and Evaporation





# Luvuvhu Mutale Shingwedzi





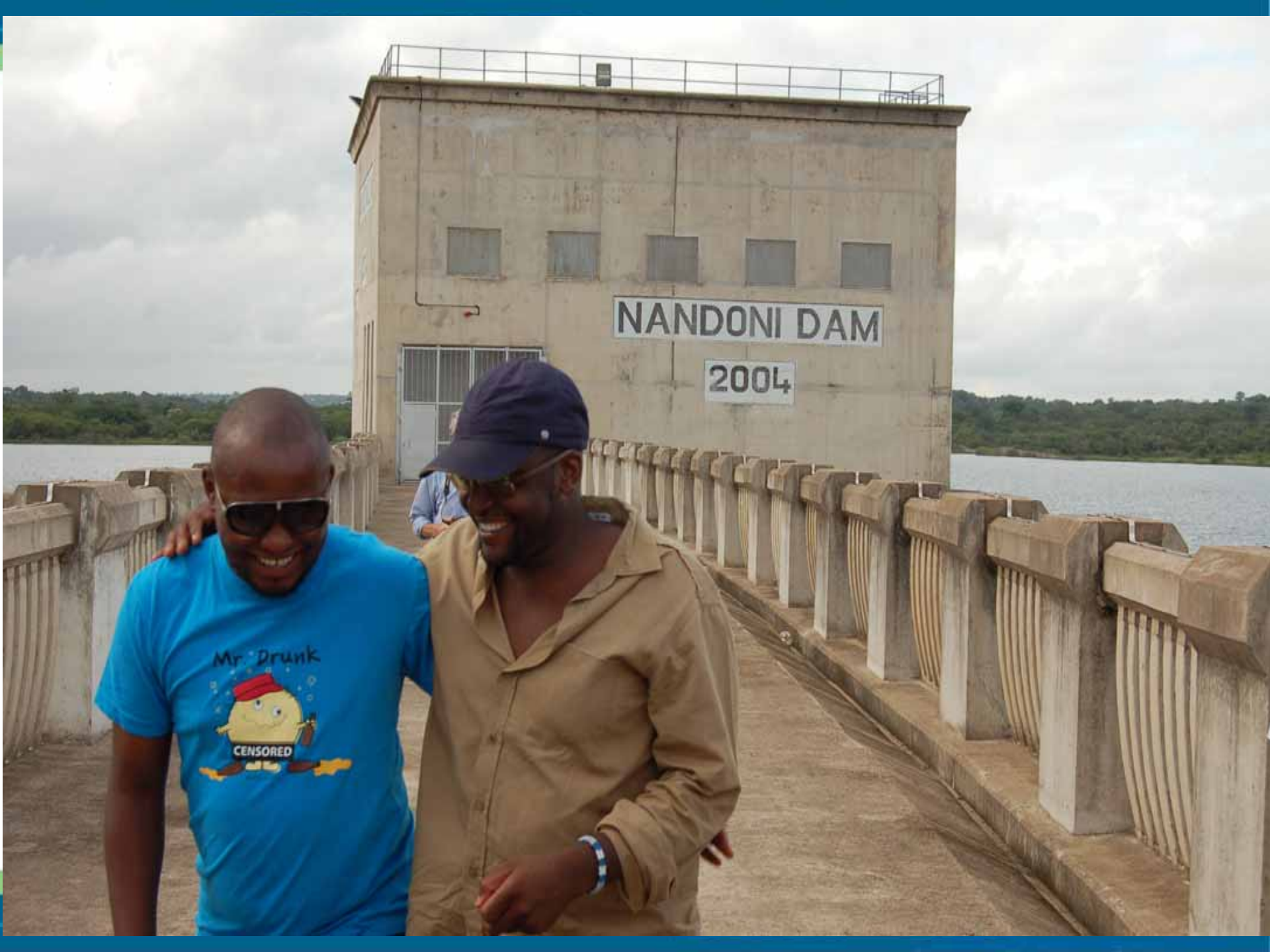
# Pipelines Giyani Area



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NANDONI DAM

2004

Mr. Drunk



CENSORED



# Mutale Catchment Status

- Small regulating storage compared to runoff.
- Water shortages are being experienced and it is unlikely that improved efficiency will improve situation to acceptable levels (statement from literature).



# Fundudzi Lake





# Irrigation Mutale Catchment



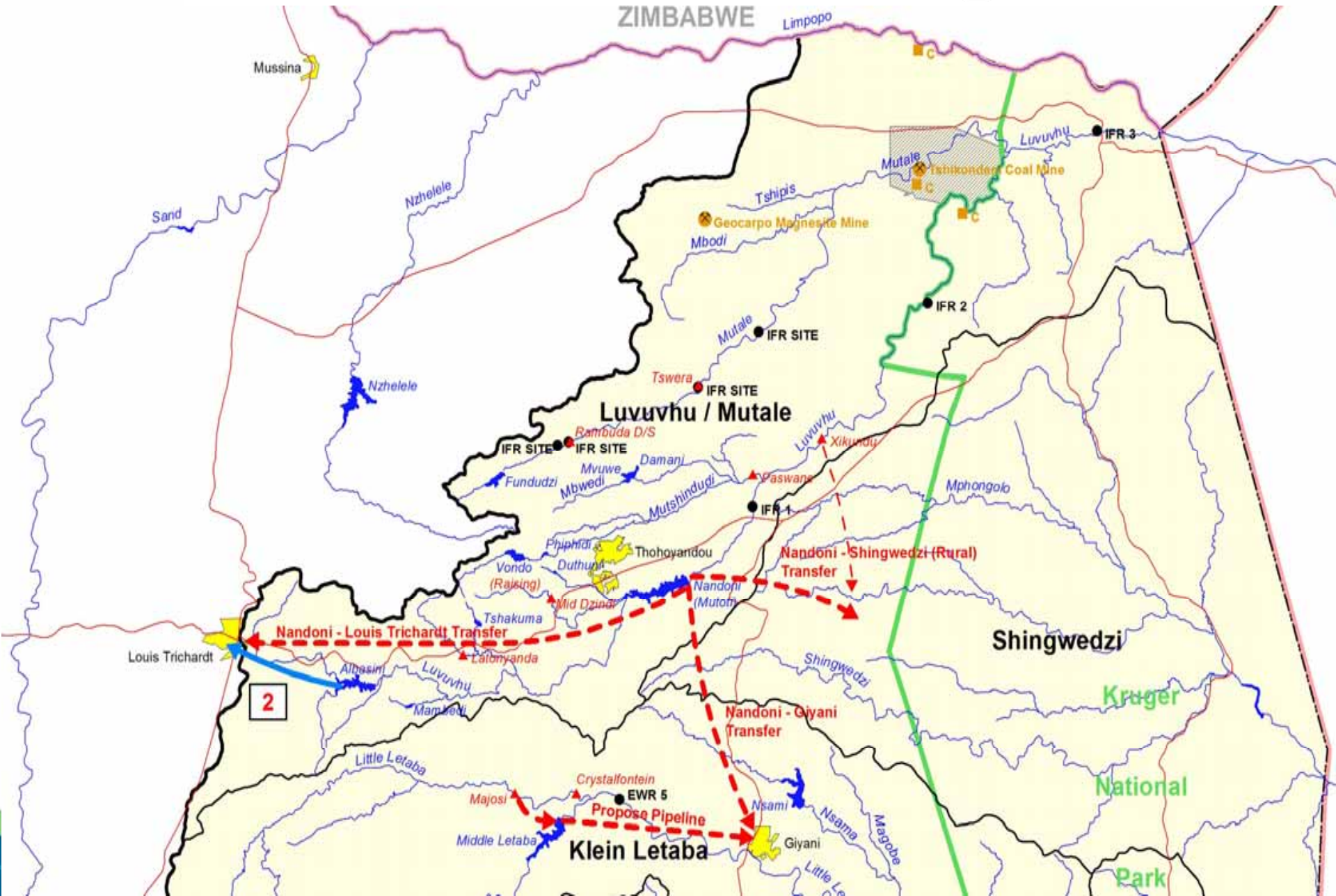


# Mutale River Catchment Options

- **Mu1: Water Conservation and Demand Management**
- **Mu2: Groundwater developments.**
- **Mu3: Dams on the Mutale River:**
  - Rambuda downstream Dam.
  - Tswera Dam.
- **Mu4: Limpopo River future source of water to supply mining developments.**



# Luvuvhu Mutale Shingwedzi





# Shingwedzi River Catchment Status

- The Shingwedzi River Catchment almost entirely in the KNP.
- Relative low rainfall and runoff.
- Water use in the catchment is small.
- Groundwater is an option for local supply.



# Shingwedzi River Catchment Options

- **Sw1: Groundwater developments.**
- **Sw2: Transfer from Nandoni Dam via Xikundu Weir.**



# Letaba Catchment Status

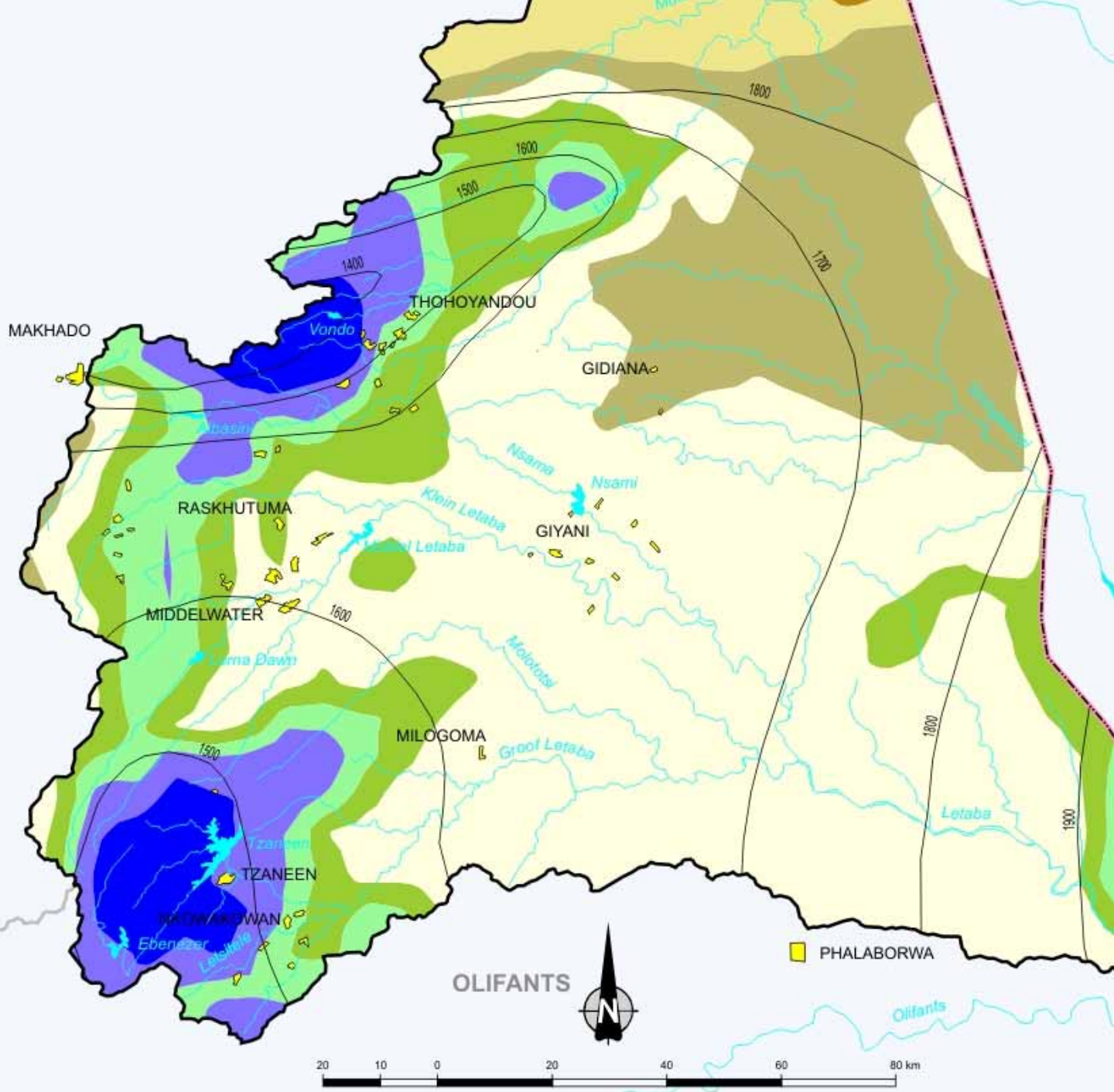
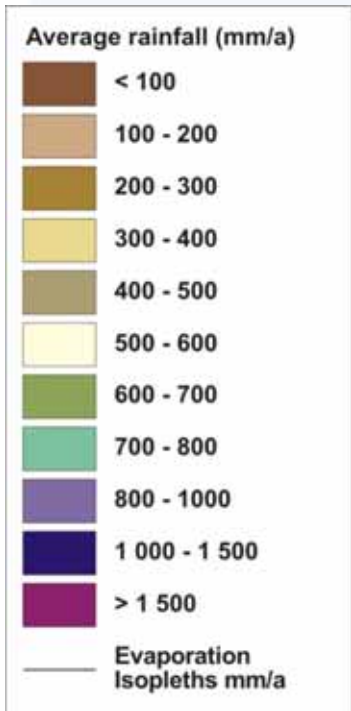
- Groot Letaba: Surface water resources are extensively developed to meet domestic, irrigation and industrial water needs – low assurance of supply.
- Middle & Klein Letaba: Water use from Middle Letaba Dam is far in excess of the available yield.
- Transfer scheme from Nandoni Dam under construction to alleviate water shortages in Giyani.
- Groot Letaba River Water Development Project (GLRWDP) - planning is underway.



# **Groot Letaba Catchment Options**

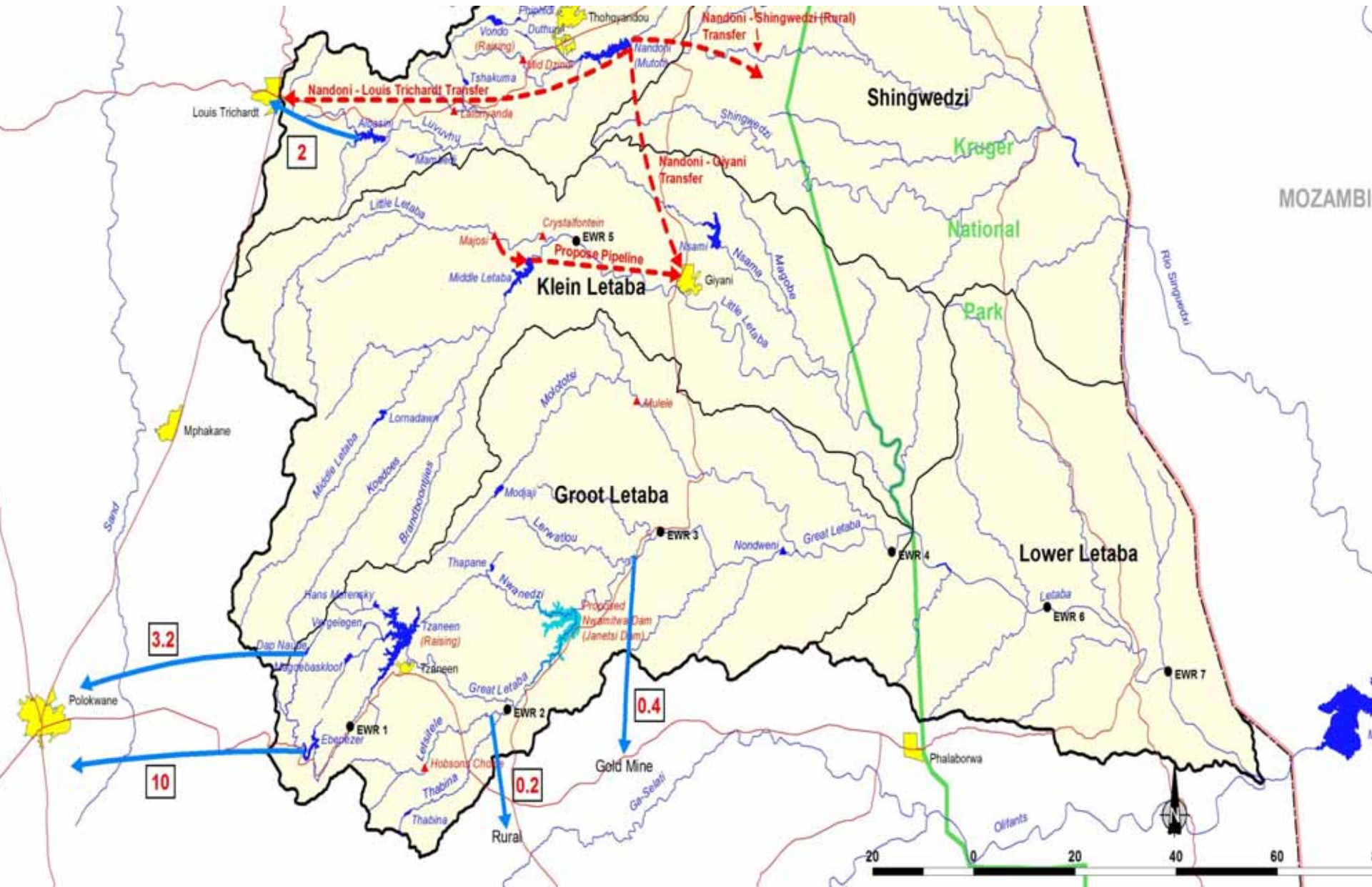
- **GL1: Raising of Tzaneen Dam.**
- **GL2: Construction of Nwamitwa Dam.**
- **GL3: Bulk Water Supply Infrastructure from Nwamitwa Dam.**
- **GL5: Artificial recharge at Mulele on Molototsi River.**
- **GL6: Groundwater regional scheme in conjunction with surface scheme.**







# Groot and Klein Letaba





# Middle & Klein Letaba Catchment Options

- **MKL1: Water Conservation & Water Demand Management.**
- **MKL2: Development of groundwater resource.**
- **MKL3: Replacement of Middle Letaba canal with pipeline.**
- **MKL4: Transfer Scheme from Nandoni Dam.**
- **MKL5: Construction of new dam on Klein Letaba River:**
  - Majosi Dam
  - Crystallfontein Dam

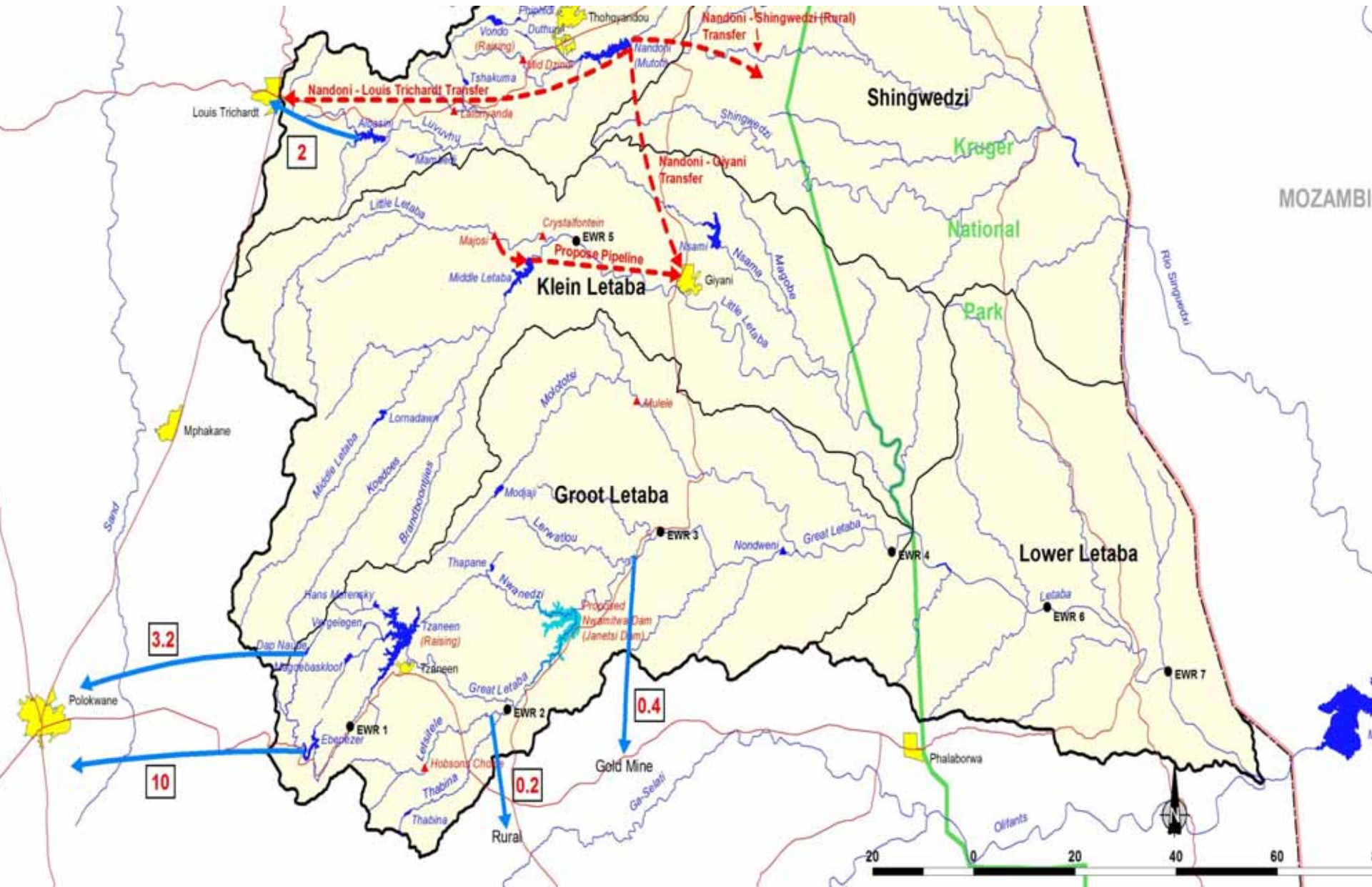


# Middle & Klein Letaba Catchment Options

- **MKL6 : Remove / buy out irrigation on Middle Letaba Scheme (trading).**
- **MKL7: Remove / buy out irrigation upstream of Middle Letaba Dam (trading).**

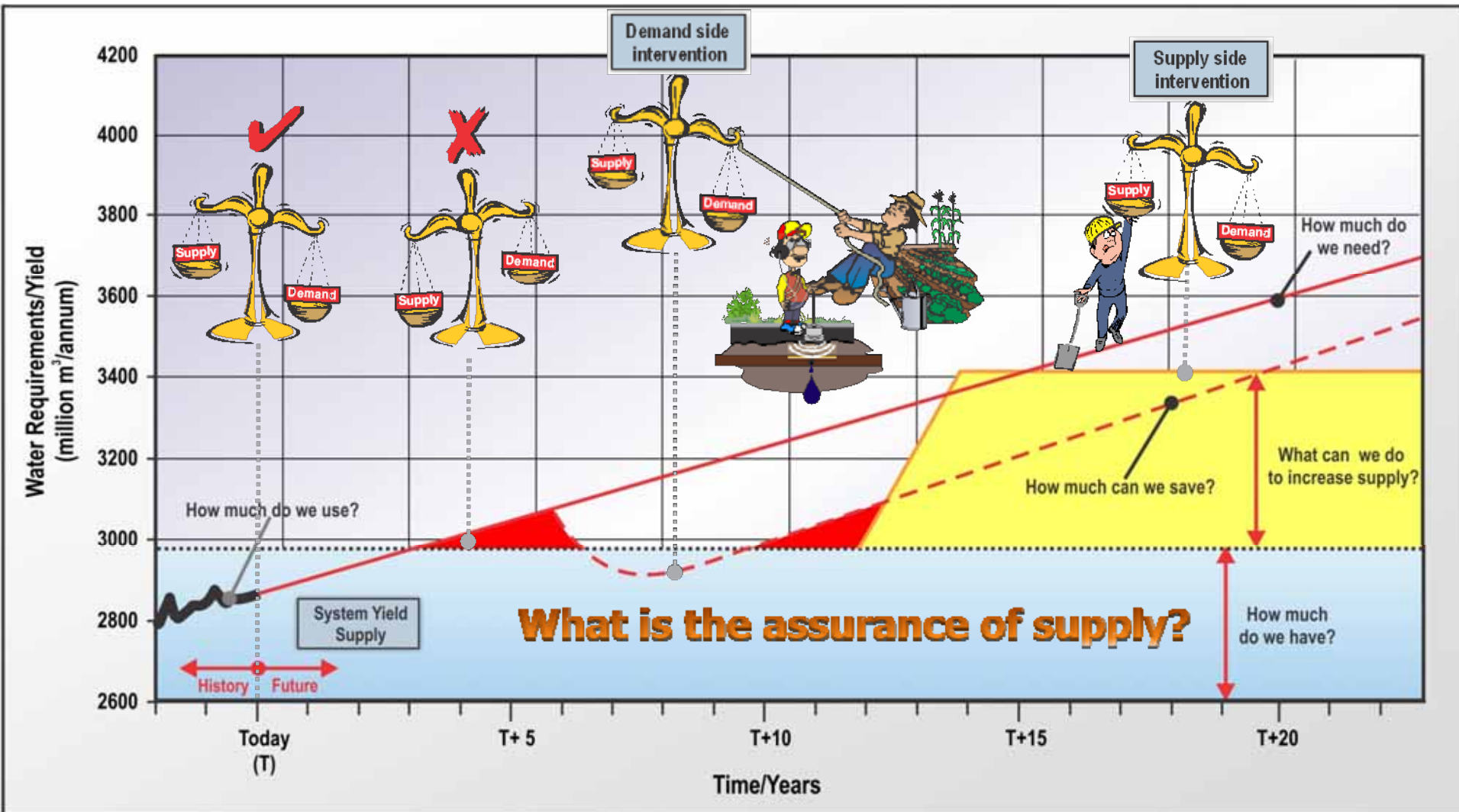


# Groot and Klein Letaba





# Reconciliation Strategy “in a nutshell”





# Thank You

(Damani Dam)

