DEVELOPMENT OF A RECONCILIATION STRATEGY FOR THE LUVUVHU AND LETABA WATER SUPPLY SYSTEM

Possible Intervention Options

Study Steering Committee meeting 31 October 2012

water affairs

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



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
 - Engineering reasonity
 Yield /demand reduction
- Formulate scenarios to supply water requirements until 2040
- Preliminary Reconciliation Strategy

Typical Interventions

Management interventions:

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



Luvuvhu Catchment Status

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



Luvuvhu Catchment Options

- Lu1: Water Conservation & Water Demand Management.
- Long term possible reconciliation options to supply Makhado and augment upper Luvuvhu:
 - Lu2: Albasini Dam in combination with Latonyanda Dam & other interventions.
 - Lu3: Nandoni Dam as primary source to Makhado.
- Lu4: Nandoni & Albasini (combination of above).
 Lu5: Further groundwater use in Nandoni supply area
- · Lus. Further groundwater use in Nand
- Lu6: Raising of Vondo Dam
- Lu7: Mid Dzindi Dam
- Lu8: Latonyanda Dam or d/s to capture flows from Tshakuma
- Lu9: Paswane Dam or Lu10: Xikundu Dam





Mutale Catchment Status

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



Mutale River Catchment Options

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



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: Water Conservation & Water Demand Management.
- Sw2: Groundwater developments.
- Sw3: 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) approved by minister.



Groot Letaba Catchment Options

- GL1: Water Conservation & Water Demand Management.
- GL2: Raising of Tzaneen Dam #
- GL3: Construction of Nwamitwa Dam #
- GL4: Bulk Water Supply Infrastructure from Nwamitwa Dam (link with GL6) #
- GL5: Artificial recharge at Mulele on Molototsi River.
- GL6: Groundwater regional scheme in conjunction with surface scheme.

GLRWDP - Options approved by Minister



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 (in process).
- MKL5: Construction of new dam on Klein Letaba River: — Majosi Dam
 - Crystalfontein 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).





