

# PUBLIC BRIEFING SESSION ON THE HYDROPOWER REQUEST FOR APPLICATIONS – 2: MZIMVUBU WATER PROJECT

Presented by: Mr. Livhuwani Mabuda  
Designation: Acting Deputy Director-General  
Branch: Infrastructure Management

Date: 22 February 2024

WATER IS LIFE - SANITATION IS DIGNITY



**water & sanitation**

Department:  
Water and Sanitation  
**REPUBLIC OF SOUTH AFRICA**



# MZIMVUBU WATER PROJECT

## PROJECT BACKGROUND

- The Mzimvubu River catchment in the Eastern Cape of South Africa is situated in one of the poorest and least developed regions of the country.
- Development of the area to accelerate the social and economic upliftment of the people was therefore identified as one of the priority initiatives of the Eastern Cape Provincial Government.
- Mzimvubu Water Project is a Strategic Integrated Project (SIP 3 project) that is intended to simulate socio-economic development in the Eastern Cape
- Project location and supply areas lie within the district municipalities of OR Tambo, Alfred Nzo and Joe Gqabi
- Public participation involving tribal authorities, communities, municipalities, Premier's Office, various departments and other stakeholders was extensively undertaken and is ongoing

# MZIMVUBU WATER PROJECT

## PROJECT FEASIBILITY STUDY

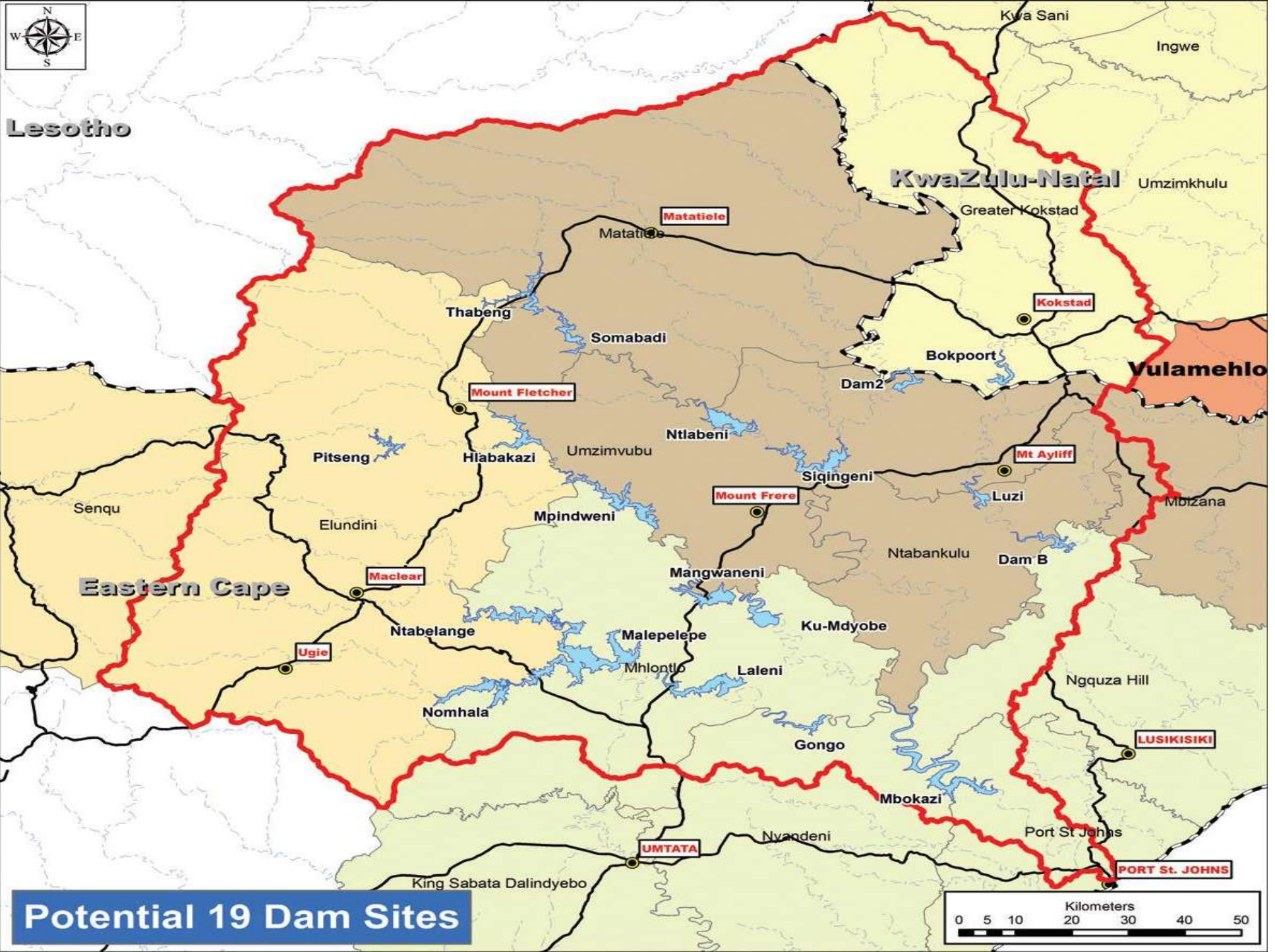
- The objective of the study was to screen and rank previously identified dam development options, and to select the best single option to be implemented first, using appropriate decision-making criteria.
- The scope of the study required that the selected single multi-purpose scheme be investigated to a feasibility level of detail
- Two multipurpose dams are proposed to be built on the Tsitsa River, a tributary of the Mzimvubu River, to supply irrigated agriculture, domestic and industrial water requirements and the generation of hydropower
- A catchment management programme has been commissioned by the Department of Forestry, Fisheries and the Environment (DFFE) to curtail soil degradation and sedimentation

# MZIMVUBU WATER PROJECT

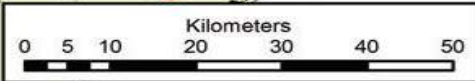
## PROJECT FEASIBILITY STUDY

- Based on previous planning work the Feasibility Study identified 19 potential dam sites (see map)
- The 19 dam sites were investigated at reconnaissance level to select best sites for further more detailed investigations
  - Upper Mzimvubu – 2 sites
  - Mzintlava River – 3 sites
  - Kinira River – 3 sites
  - Tina River – 5 sites
  - Tsitsa River – 5 sites
  - Lower Mzimvubu – 2 sites





# Potential 19 Dam Sites



# MZIMVUBU WATER PROJECT

## MULTI-CRITERIA DECISION ANALYSIS

The multi-criteria decision analysis conducted to rank the sites involved the following factors:

- Technical and economic considerations:
  - Yield potential
  - Capital cost
  - Unit reference value (URV)
  - Accessibility of site
  - Hydropower potential
  - Sediment yield
  - Forestry potential
- Environmental and social considerations
  - Irrigated agriculture potential
  - Domestic water supply
  - Environmental impacts
- Job creation

# MZIMVUBU WATER PROJECT

## PROJECT FEASIBILITY STUDY

- The multi-criteria decision analysis produced 7 best sites, for further screening, as follows:
  - Ntabelanga dam site (Tsitsa River)
  - Thabeng dam site (Kinira River)
  - Somabadi dam site (Kinira River)
  - Lalini dam site (Tsitsa River)
  - Mpindweni dam site (Tina River)
  - Nomhala dam site (Inxu River)
  - Mbokazi dam site (Lower Mzimvubu River)

# MZIMVUBU WATER PROJECT

## MULTI-CRITERIA DECISION ANALYSIS

Dam Site	Capital Cost	URV (R/m <sup>3</sup> )	Accessibility	Hydropower	Irrigation	Domestic Water	Environmental	Job Creation
Thabeng	2	2	4	3	1	2	1	1
Somabadi	3	2	4	2	1	2	2	1
Mpindweni	2	2	2	2	4	2	2	3
Nomhala	2	3	2	3	2	2	4	2
Ntabelanga	1	1	2	1	1	1	2	1
Lalini	4	2	2	1	4	1	4	3
Mbokazi	4	1	4	1	4	4	4	3



# MZIMVUBU WATER PROJECT

## FEASIBILITY STUDY RECOMMENDATIONS

- Feasibility investigations recommended a conjunctive scheme entailing the construction of Ntabelanga and Lalini dams.
- Ntabelanga dam will supply domestic water, hydropower and irrigated agriculture
  - some 726,617 people and other water consumers in the region
  - irrigation of some 2 868 ha of high potential agricultural land
- The total installed Hydro-Electric Power Plant (HEPP) capacity at Ntabelanga Dam and Lalini Dam and Lalini HEPP is estimated at 47.5 MW with an average generation of 23 MW.

# MZIMVUBU WATER PROJECT

## PROJECT FACTS

DESCRIPTION	NTABELANGA DAM	LALINI DAM
Mean annual runoff (present day)	415 million m <sup>3</sup> per year	828 million m <sup>3</sup> per year
Storage capacity	490 million m <sup>3</sup>	232 million m <sup>3</sup>
Area of dam basin	31.5 km <sup>2</sup>	14.5 km <sup>2</sup>
Length of dam basin	15.5 km	22.5 km
Dam type	Roller compacted concrete (RCC) gravity dam	Roller compacted concrete (RCC) gravity dam
HYDROPOWER PLANTS		
Hydro-Electric Power Plant (HEPP) installed capacity	37.5 MW at Lalini Hydro-Electric Power Plant 5.0 MW at Lalini Dam 5.0 MW at Ntabelanga Dam ----- 47.5 MW Total Installed Capacity	
Average Hydropower Output	23 MW	
Total hydropower generation	200 million kW-hours per annum	

# MZIMVUBU WATER PROJECT

- To further harness the resources of the Mzimvubu River Catchment, there are opportunities to develop hydropower further.
- An example is the hydropower scheme that was investigated at a pre-feasibility level (1987 study) entailing a dam at Mbokazi with a storage capacity of 5950 million m<sup>3</sup> and an estimated hydropower potential of 1650 MW. A further feasibility study on this option was recommended.
- The development of Mbokazi Dam is also identified as a long-term option to augment water supply to other catchments such as transfers to the Orange River Basin as a water security measure.
- This proposed scheme and any other option in the Mzimvubu Catchment can be appraised further (enabled through this Request for Applications 2 (RfA2) process), at feasibility planning level of detail, after which the follow-on project development processes including detail design, construction and operation can unfold.

**THANK YOU**