Water Resource Associates

A network of consultants in hydraulics, hydrology, groundwater & environmental issues

Project title: **Development of a Future Water Source for Dar Es Salaam**

Summary: To propose and recommend a water source development strategy for Dar Es Salaam, considering all surface water and groundwater sources, including a review of social and environmental factors.

Client: Dar Es Salaam Water and Sewerage Authority	**Financed by:** The World Bank
Period of assignment: Jan 2005 – Jul 2006	**Location**: Tanzania
Project Value: not known	**WRA services:** £33 900
In association with: Norconsult AS, Norwegian Institute for Water Research (NIVA) and Norconsult Tanzania Ltd	**Scope of WRA assignment & Background:** Surface water hydrological studies, supported by local staff from Norconsult Tanzania Ltd

⇪ Dry bed of Ngerengere River at Ngerengere Town in October 2005

⇪ Escape of water from a breach in the bank of Ruvu River at Kidogozero, February 2005

The present supply to Dar es Salaam city is from three sources: Upper Ruvu (81 Mld), Lower Ruvu (182 Mld) and Mtoni (9 Mld). This is supplemented with a flow of 36 Mld abstracted from shallow boreholes within the city perimeter. The two largest treatment plants are located on the Ruvu river, about 60 km west of the city, and water is transferred through pipelines to the city supply network.

The headwaters of the Ruvu river are located in the Uluguru Mountains, near Morogoro town, and during the dry seasons the perennial flow originating from this area flows across dry plains to the sea. The low flow of the Ruvu River is inadequate and the city has experienced water shortages during the driest periods of recent years.

Water shortages

The project showed that the unregulated river does not provide a reliable source of surface water for a major city such as Dar es Salaam. There have been incidents in three separate years when the low flows have been unable to meet the full demand at the two intakes.

Various options for regulating the river were considered, including impounding dams on the perennial channels of the main stream and larger tributaries, pumped-storage to smaller reservoirs located on ephemeral tributaries, and bunded reservoirs situated on the flood plain in the vicinity of the treatment works. The most promising option was for a reservoir at Kidunda, where the most downstream of four possible dam locations was recommended, in order to alleviate any environmental concerns arising from the adjacent Selous Game Reserve

Project Number 000132

Directors
Frank A K Farquharson
Paul A C Holmes
Dr A Nick Mandeville
Ronald E Manley
Dr Andrew J Wade
Professor Paul G Whitehead

Head Office:
PO Box 838
Wallingford
Oxon OX10 9XA
Tel: +44 (0) 1491 838190
E-mail: info@watres.com

Company Registered in England Number 2979072 Registered Office: 25 Hart Street, Henley-on-Thames, Oxon. RG9 2AR
VAT Registration No 630 813170

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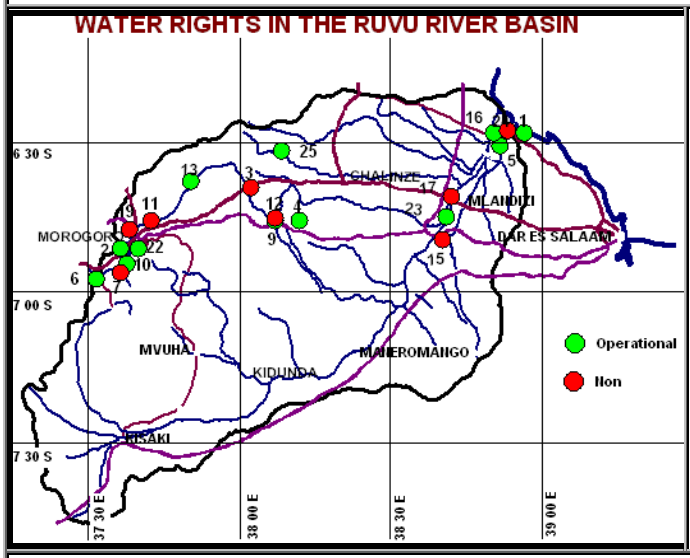
Catchment Modelling: Development of a Future Water Source for Dar Es Salaam



Final Results

Comparison of recent and historical discharge measurements indicate a decline in dry season perennial flows, which started in the late 1980s. The reasons for this decline could include climate change, reduction in forest cover, or unknown upstream abstractions, but no definite factor has yet been identified on the ground.

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If a dam does not prove feasible, the fall-back surface water option would be a transfer of water from the Great Ruaha river along a 15 km route, with pumping to the ridge separating the two basins, from where the water would be gravitated to the Msoro river, which is an upstream tributary of the Ruvu river.

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