



NILE BASIN INITIATIVE

NILE EQUATORIAL LAKES SUBSIDIARY ACTION PROGRAM

**MARA RIVER BASIN TRANSBOUNDARY INTEGRATED WATER
RESOURCES MANAGEMENT AND DEVELOPMENT PROJECT**

**CONSULTING SERVICES FOR UNDERTAKING FEASIBILITY
STUDIES OF TWO SMALL-MEDIUM MULTIPURPOSE STORAGE
RESERVOIRS OF NORERA AND BORENGA IN KENYA AND
TANZANIA RESPECTIVELY IN THE MARA RIVER BASIN**

COUNTRY: KENYA AND TANZANIA

Background

The Mara Transboundary Integrated Water Resources Management and Development Project is one of the three Trans-boundary River Basin Management projects being implemented within the framework of the Nile Equatorial Lakes Subsidiary Action Program (NELSAP) of the Nile Basin Initiative, the others being the Sio-Malaba-Malakisi and Kagera River Basin Management Projects. The Mara River's upper tributaries rise from a swamp at an elevation of 2,900 m above mean sea level in the Mau Escarpment of Kenya and discharges into the Musoma Bay in Lake Victoria at an elevation of 1,134 m above mean sea level. Rainfall in the catchment is positively correlated to elevation, the highest being in the Mau Escarpment (1,400-1,800 mm), and the lowest being in Musoma (700-800 mm). The River is about 400 km long, and drains a total basin area of approximately 13,325 km². The population residing in the basin is approximately 1.3 million people. The Mara River Basin is internationally recognized due to Maasai Mara-Serengeti ecosystem. Jointly, these ecosystems were recently declared the seventh new Wonder of the World.

The Mara River Basin is increasingly facing water shortages as well as problems with poor water quality and environmental degradation. Water shortage is due to droughts, irregular rainfall distribution and general climatic variability which have negative hydrological impacts on the available water resources. Significant threats include loss of native forest cover in the upper parts of the basin, unsustainable agricultural expansion, decreasing dry season flows amid increasing water abstraction for livestock, domestic, tourism facilities, industrial and irrigation. These problems have resulted in transboundary impacts which include floods and high sedimentation in the low lying plains of Mara valley, poor water quality, low levels of water availability during the dry season and thus leading to competition for and conflicts over available water. Water related conflicts¹ are on the increase and pose a serious security risk in the catchments. These problems have direct impacts on people's livelihoods, health, food security, natural resources and more so to the Maasai Mara Reserve and Serengeti National Park conservation areas.

Water balance of river Mara sub-basins has been conducted to establish the probable figures of water surpluses and deficits in the basin. Water scarcity was noted to increase due to shifting rainfall patterns and unavailability of storage resulting into water scarcity within the Mara basin. The situation is expected to get worse as the population increases and as demand by the different sectors out-matches the existing supply. Agriculture is the backbone of the basin population and it is estimated that 80% of the population lives in rural areas practicing small to medium scale farming. Major rainfall events in the Mara River catchment occurs in the upper catchment of the basin where a lot of water is lost through runoff which causes flooding to people properties and infrastructure especially to the downstream low lying plains of Mara valley in Tanzania. This runoff needs to be harnessed for use during times of water scarcity often experienced during the dry season. It is, therefore, important that a regional water infrastructure program is developed and implemented to harness the water for multipurpose use, contribute towards poverty

¹ <http://www.atpsnet.org/pubs/research/estrategiesarticle.pdf>

reduction and improve living conditions of the population within the basin. The proposed development of water storage facilities will contribute towards addressing water shortages and improve on food productivity, increase access to water for the livestock, agriculture and domestic purposes especially the poor and vulnerable populations as a basic precondition for sustainable livelihood.

Two potential sites for development of water reservoirs were identified in Norera and Borenga in Kenya and Tanzania respectively as shown in the map below. The two dams will reduce peak flood flows and delay the release of floodwater into the lower reaches of the floodplain, thus the number of properties potentially affected by flooding in the lower catchment would be reduced.

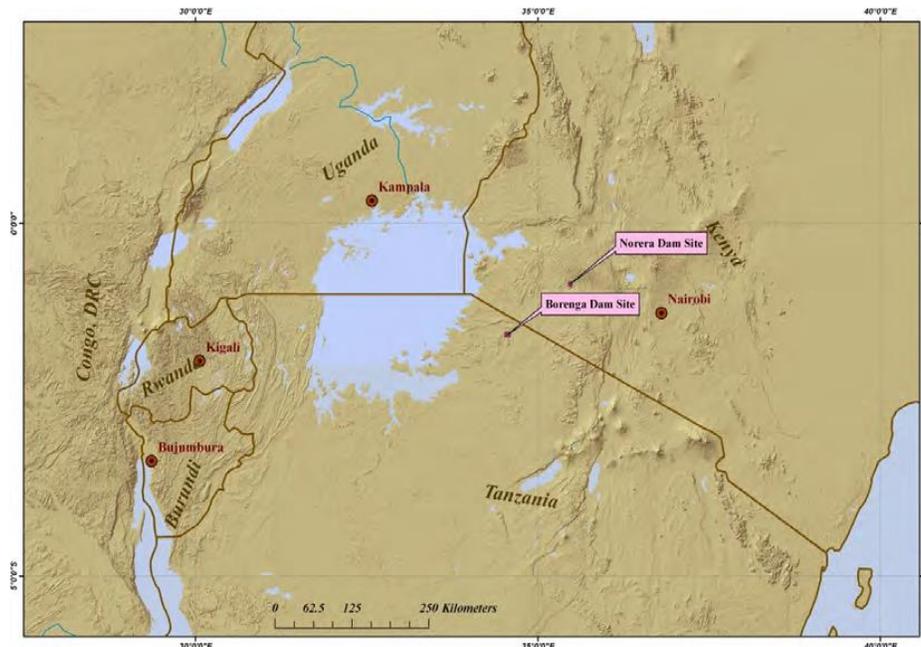
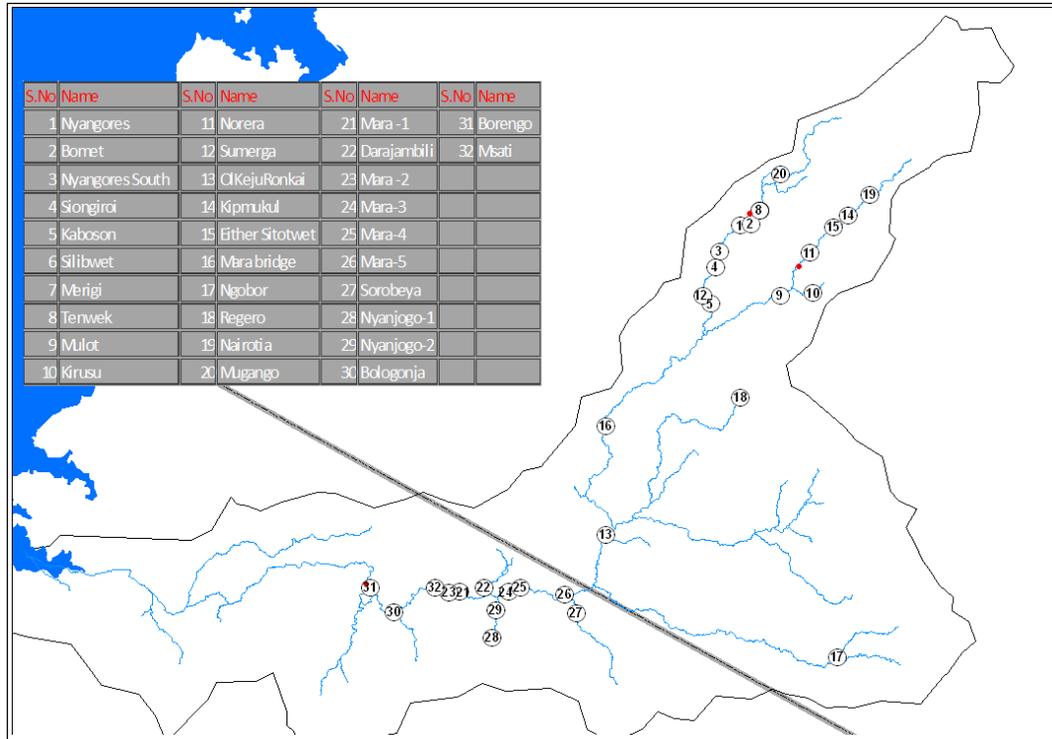


Figure: Location of Norera and Borenga dams

The two sites have been proposed to undergo feasibility study. Implementation of the two sites are intended to meet two key objectives: (i) reduce flooding in the lower Mara River basin by increasing the flood mitigation; and (ii) increasing water storage capacity in the basin hence provide water for irrigation, domestic and livestock purposes. This will improve livelihoods for the communities and reduce environmental degradation in the basin.



Locations of Proposed Damsites in Mara River Basin

Location

Norera dam site is located at coordinates 0⁰ 52’ 28” South and 35⁰ 27’ 30” East. The proposed dam axis lies around Sinoni Cattle dip and about 5km North East of Kapkimolwa Market Centre. The dam site is found along Amala River and shared between Narok South and Bomet districts of Kenya. The site can be accessed from Mulot Market along Mulot-Kapkimolwa-Kembu murram Road or from Longisa Market along Longisa-Kapkimolwa-Kembu murram road. .

Economic and Financial Analysis.

The Consultant will undertake both the financial and economic analyses of the projects including costs for implementing the Environmental and Social Management Plan and Resettlement Action Plan. The economic analysis should be conducted in such a way that ensures economic efficiency, fiscal equivalence and distributional equity. This is carried out while taking into account the various costs (including costs of the environmental management/mitigation measures and resettlement) and tangible benefits identified and costed. The cost of construction management shall also be included in the estimate as separate items. Appropriate contingencies will be applied to take account of factors which cannot be adequately defined at the feasibility phase.

The financial analysis will aim at determining whether beneficiaries will be able to pay reimbursable costs for project outputs that sufficient capital will be available to finance construction to completion, and that estimated revenues will be sufficient to cover allocated

costs over the repayment period. The consultant shall undertake a sensitivity analysis (to check impact of important parameters on the economic and financial viability) for the two project sites and enumerate the non-quantifiable effects of the project that may influence detailed design and the investment decision. *Indicators for both financial and economic analysis such as Net Present Value, Benefit Cost Ratio and Internal Rate of Return shall be calculated.*