



African Water Facility
Facilité africaine de l'eau

Mobilising Resources for Water in Africa
Mobiliser des ressources pour l'eau en Afrique



United Republic of Tanzania

Feasibility Study for
The Kikonge Multipurpose Dam,
Hydropower and Irrigation Project

PROJECT APPRAISAL REPORT

June 2016

African Water Facility | Facilité africaine de l'eau

African Development Bank | Banque africaine de développement

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List of acronyms and abbreviations

ADB, AfDB	<i>African Development Bank</i>
AMCOW	<i>African Ministers' Council on Water</i>
AWF	<i>African Water Facility</i>
BOQ	<i>Bill of Quantities</i>
CM	<i>Council of Ministers</i>
CSP	<i>Country Strategy Paper</i>
EA	<i>Executing Agency</i>
EIRR	<i>Economic internal rate of return</i>
EPP	<i>Emergency Power Plant</i>
ESAP	<i>Environmental and Social Assessment Procedures (of AfDB)</i>
ESIA	<i>Environmental and Social Impact Assessment</i>
EWURA	<i>Energy and Water Utilities Regulatory Authority (Tanzania)</i>
GOT	<i>Government of Tanzania</i>
GWh	<i>Giga Watt hour</i>
IPP	<i>Independent Power Plant/Producer</i>
kWh	<i>Kilowatt hour</i>
LFA	<i>Logical Framework Approach</i>
LV	<i>Low Voltage</i>
MAFC	<i>Ministry of Agriculture, Food Security and Cooperatives (Tanzania)</i>
M&E	<i>Monitoring and Evaluation</i>
MEM	<i>Ministry of Energy and Minerals (Tanzania)</i>
MDGs	<i>Millennium Development Goals</i>
MoU	<i>Memorandum of Understanding</i>
MoWI	<i>Ministry of Water and Irrigation</i>
MW	<i>Mega Watt</i>
NCB	<i>National Competitive Bidding</i>
NEPAD	<i>New Partnership for Africa's Development</i>
NGOs	<i>Non-Government Organisations</i>
NIC	<i>National Irrigation Commission</i>
NPV	<i>Net present value</i>
NSH	<i>National Shopping</i>
NSL	<i>National Short-Listing</i>
NWSDS	<i>National Water Sector Development Strategy</i>
O&M	<i>Operation and Maintenance</i>
PCR	<i>Project Completion Report</i>
PPA	<i>Power Purchase Agreement</i>
PPP	<i>Public Private Partnership</i>
PSRGSP	<i>Power Sector Reform and Governance Support Program</i>
RBA	<i>River Basin Authority</i>
REA	<i>Rural Energy Agency (Tanzania)</i>
RFP	<i>Request for Proposals</i>
RMC	<i>Regional Member Country</i>
SADC	<i>Southern African Development Community</i>
SC	<i>Steering Committee</i>
SSEA	<i>Strategic Social and Environmental Assessment</i>

TANESCO	<i>Tanzania Electric Supply Company</i>
TM	<i>Task Manager</i>
ToR	<i>Terms of Reference</i>
TZ	<i>Tanzania</i>
TZFO	<i>Tanzania Field Office (of the AfDB)</i>
UA	<i>Unit of Account</i>
WSDP	<i>Water Sector Support Project</i>
WSS, WS&S	<i>Water Supply & Sanitation</i>

1. Country	The United Republic of Tanzania
2. Name	KIKONGE multipurpose dam, irrigation and hydropower project feasibility study.
3. Place	The United Republic of Tanzania
4. Recipient	TANESCO National Electricity Company and Ministry of Agriculture, Food Security and Cooperatives – National Irrigation Commission (NIC)
5. Executing agency	TANESCO
6. Description	Component 1: Feasibility Study Component 2: Strategic Social and Environmental Assessment (SSEA) Component 3: Other Studies and Technical Assistance: Climate Change Resilience Assessment, Financing Plan for Implementation, International Notification Process Component 4: Study Management
7. Total cost	€ 2,462,399 (net of taxes and duties)
8. AWF Cost	€ 1,986,198 (net of taxes and duties)
9. Cost (other)	€ 263,200 CRIDF Grant € 213,000 Government of Tanzania (in kind)
10. Date of approval	
11. Duration (From Grant Approval + duration of studies)	22 months (including a 15 months' period for the studies)
12. Other important dates	Grant Signature: Date of approval +2 months
13. Acquisitions	For funding provided by the AWF, acquisitions shall be carried out in accordance with the Bank's Rules and Procedures for Goods and Works Acquisitions and the Bank's Procedures for Use of Consultants CRIDF will apply its own rules for the procurement of consultant services under its funding
14. Currency Equivalentents (October 2015)	1 UA/UC = 1.25405 € 1 UA/UC = 1.40642 \$US 1 UA/UC = 822.603 XOF
15. Fiscal year	1 st April to 31 st March

EXECUTIVE SUMMARY

Project History and Background

The Ruhuhu Irrigation project first appeared at the SADC Water Sector Infrastructure Investment Conference which was held in Maseru in September 2011. It is included in the SADC Regional Infrastructure Development Master Plan of August 2012. The project is listed in the COMESA-EAC-SADC Tripartite Regional Infrastructure Project Data base (TRIPDA). The Ruhuhu Irrigation project is included on the Tanzanian National Irrigation Master Plan.

The site for the dam was initially identified in the 80's through a scoping study funded by DANIDA, the Danish International Development Agency on behalf of the Ministry of Water. In 2013 the CRIDF conducted a reconnaissance mission in Tanzania which led to confirm the basic features of the scheme and its appropriateness for the development of a multipurpose dam project including the development of an irrigated area of 4,000 ha. The Kikonge Hydropower project is now being entered into the Power Supply Master Plan of Tanzania presently under revision.

Sectorial Priorities

Agriculture is the basis of Tanzanian economy. It produces about 26.8 per cent of the National Gross Domestic Product (GDP), three quarters of the exports, and provides employment for about 75 percent of the working population. The proposed irrigation project aligns with the focus to contribute to food security and poverty reduction, and is also in line with the Government's "Second National Strategy for Growth and Reduction of Poverty" (NSGRP 2010/2015), the "Rural Development Strategy Dec. 2001", the "Agricultural and Livestock Policy 1997", and the "National Irrigation Act 2013".

Tanzania's current nationwide access rate to electricity is at 24%, this is very low compared to countries in North Africa and South Africa. It is recognised that the energy mix should be diversified in the medium and long term, while addressing climate change considerations and attracting private sector participation. In this regard, the planned revision of the National Energy Policy will address the promotion of renewable energy for sustainable development.

As a water management infrastructure project for multi-usages, the proposed project is well aligned with AWF 2012-2016 strategy pillar I, preparation of bankable projects. It is also aligned with the priorities of the Bank's Long-Term Strategy 2013-2022 comprising infrastructure development as one of its operational priorities coupled with contributing to agriculture and food security as areas of special emphasis. The Multipurpose Dam project, which is the ultimate outcome of the proposed studies, is fully in line with the "High-Fives," and supports 4 out of the High-Fives directly – energy food security, industrialisation, livelihood improvement. Integration is also supported as the downstream project affects transboundary water and falls under the ZAMCOM agreement.

Problem Definition

The project area is in the south-western part of Tanzania, close to the shores of the Lake Nyasa. In this region, crop production is currently dominated by rain fed systems. Irrigation has been identified as one of the key activities for boosting agricultural productivity and for providing additional revenues to local farmers.

One of the main challenges for Tanzania is to foster its economic growth and reduce poverty. To supply electric energy in sufficient quality and quantity will support the Government in these challenges. The energy generation mix is mainly thermal plants, with extremely high operation costs, and hydropower plants of the run-off the river type, highly vulnerable to drastic variations of water availability as a consequence of climate changes. There is no significant (hydropower) generating capacities in the south west part of the country, and the Ruhuhu project will address this geographical as well as energy-mix unbalance.

Project Objectives, Beneficiaries and Benefits

The main objective of the multipurpose project is to foster the socio-economic development in the area and to contribute to the economic growth of the country. This objective is achieved through the development of 4,000 Ha of irrigated agriculture for the benefit of local farmers and stakeholders and by increasing food security and trade at the larger scale of the country and possibly at regional level. The hydropower scheme, with an estimated annual production of 1,360 GWh, will provide a response to the challenge facing the electricity sector in. The dam also dramatically improves the resilience to climate change by regulating the flow of the Ruhuhu River allowing a stable supply of water, food and energy throughout the year.

The direct beneficiaries of the study are the Ministry of Agriculture, Food Security and Cooperatives (MAFSC) and the National Irrigation Commission (NIC), the Ministry of Energy and Mines (MEM) and TANESCO the national electricity company. The implementation of this project will substantially benefit the populations in the area estimated at 15,000 inhabitants. It will also benefit the productive socio-economic actors in the various sectors of industry, agriculture, trade and tourism at the national level.

The studies will be detailed and comprehensive beyond what is normally done in a pre-feasibility study. Some activities will reach full feasibility study level.

Costs, Financing and duration

The total estimated cost of the feasibility studies, net of taxes and duties, (including those funded by CRIDF) and SSEA studies is estimated at **€ 2,462,399** (including a 5% contingency reserve on donors' contributions only). AWF's share is **€ 1,986,198** (80.7%) share of CRIDF is **€ 263,200** (10.7%) and the in kind contribution from the Government of Tanzania estimated as equivalent to **€ 213,000** (8.6%).

The estimated overall duration of the project is 22 months, including 15 months for the performance of the studies.

Conclusions and Recommendations

With the ultimate aim to reduce poverty and increase economic growth, the project, when the infrastructure is commissioned, will improve availability of water resources for irrigation and associated activities in the area and electricity generation and supply to the national grid. It will, through the irrigation and water supply components, directly benefit about 15,000 inhabitants in the immediate vicinity of the project area. The electricity generation will benefit Tanzania as a whole. Therefore, the project is of utmost importance for the region and fits into the country national water resources and electricity sector development objectives and strategy. It is coherent with the Africa Water Vision. The Multipurpose Dam project, is fully in line with the "High-Fives," and supports 4 out of the "High-Fives" directly – energy food security, industrialisation, livelihood improvement. Integration is also supported as the downstream project affects transboundary water and falls under the ZAMCOM agreement. When the full feasibility studies are funded a leverage effect of approximately 1/130 will be achieved.

Based on the analysis of the project's pertinence, effectiveness and sustainability, it is recommended that a grant not exceeding **€ 1,986,198** from AWF resources be extended to The United Republic of Tanzania.

Country and project name: KIKONGE multipurpose dam, irrigation and hydropower feasibility study						
The purpose of the project is to improve the country socio-economic development through water resources development and management for increasing water availability for multiple purposes: Irrigation, hydropower, water supply and other usages.						
RESULTS CHAIN		PERFORMANCE INDICATORS			Means of Verification	Risks/Mitigation Measures
		Indicator	Baseline	Target		
IMPACT	Improved livelihood, social well-being and socio economic development through water resources mobilisation for multiple uses: Irrigation, hydroelectricity generation, water supply, fisheries and tourism	i) Proportion of population below national poverty line ii) Irrigated Area	2011: 28.2% 2015: 50 ha (In the Project area) 364,000 ha (Countrywide)	Horizon 2025 10% 4,000 ha (2020) + 1% (Project contribution)	i) Water, irrigation, electricity sector national statistics ii) National Bureau of Statistics iii) TANESCO annual reports	Risk: project is not implemented because of lack of funds Mitigation: Information and mobilisation of donors and private sector is maintained during the duration of the studies Risk: Populations and other stakeholders are opposed to the project Mitigation: The SSEA will identify the impacts at an early stage and the ESIA will develop mitigation measures through ESMP and RAP
		iii) Hydropower Capacity and Generation iv) Water storage for all year availability	2015: 0 MW (In the Project area) 0 GWh 2015: No storage	+ 300 MW (2025) + 53% increase of country hydropower capacity 1,300 GWh (2025) (2025) 9 Bm ³ stored for further release during the year and regulation of the Ruhuhu River, the Lake Nyasa levels and the downstream outlet Shire River regimes	iv) Dam operation records	
OUTCOMES	Funds (€ 2,5 million) are mobilised for development of the feasibility and final design of the project and the ESIA studies	i) Funders' Roundtable ii) % of financing pledged	0%	Horizon 2017: i) Round Table takes place ii) 100% of costs for the full feasibility and final design are mobilised	Funders roundtable minutes and proceedings	
Components						
Component 1: feasibility of the multipurpose project						
OUTPUTS	Project feasibility and outline design approved by TANESCO and NIC	Approval letters	NA	Horizon 2017: TANESCO and NIC approve the project preliminary design and the ToR for the further studies	i) Quarterly progress reports ii) Minutes of workshops ii) Final ToR	
	Component 2: Other studies and technical assistance					
	i) Climate Change Resilience Assessment ii) International Notification Process iii) Financing Plan for Implementation	i) Assessment Report ii) Notification Process defined iii) Financing plan	NA	Horizon 2017: i) Assessment report approved ii) Notification process initiated	i) Report ii) Communications and exchange of letters with other States iii) Financing Plan report	

Country and project name: KIKONGE multipurpose dam, irrigation and hydropower feasibility study The purpose of the project is to improve the country socio-economic development through water resources development and management for increasing water availability for multiple purposes: Irrigation, hydropower, water supply and other usages.					
RESULTS CHAIN	PERFORMANCE INDICATORS			Means of Verification	Risks/Mitigation Measures
	Indicator	Baseline	Target		
	established		iii) Financing plan validated		
Component 3: Strategic Social & Environmental Assessment – SSEA					
SSEA report approved by National Environmental Authorities	Approval certificates by National Authorities	NA	Horizon 2017: i) Issuance of certificates ii) ToR for the full ESIA studies	i) Certificates ii) ESIA studies ToR approved	
Component 4: Study Management					
Timely delivery of project outputs	i) Study Coordination Unit (SCU) in place with Study Coordinator nominated ii) Steering and Consultative Committees are established iii) No of procurement on time iv) Progress reports on time	NA	Horizon 2016 i) & ii) Complete project team and Committees are operational iii) Award of Consultants' contracts iv) 4 per year	i) Notes and decisions of creation and nominations ii) AWF No objection letter to CV of Study Coordinator iii) Disbursement of AWF grant	Risk: Lack of government funds restricts effective project management Mitigation: The setup of the SCU and corresponding budget is a condition for the first disbursement of funds in the grant agreement.
Components				Amount in €	Source of Fund and % of Total Cost
KEY ACTIVITIES	Component 1: Feasibility Studies This component consists of: - Data and information collection; - Site reconnaissance and investigations; - Techno-economic studies; - Drafting of Feasibility Studies Terms of reference; - Promotion of the project and mobilization of funds for the Full Feasibility Study			€ 1,746,751	AWF (100 %) (70.9% of Total cost)
	Component 2: Other Studies and Technical Assistance These studies are carried out by CRIDF and consists of – Climate Change Risk Assessment; - Financing Plan for Implementation; - International Notification process			€ 263,200	CRIDF (100 %) (10.7% of Total cost)
	Component 3: SSEA Studies This will be carried out in 3 phases – Public Consultation Strategy; - Scoping study			€ 239,447	AWF (100%) (9.7% of Total cost)

Country and project name: KIKONGE multipurpose dam, irrigation and hydropower feasibility study					
The purpose of the project is to improve the country socio-economic development through water resources development and management for increasing water availability for multiple purposes: Irrigation, hydropower, water supply and other usages.					
RESULTS CHAIN	PERFORMANCE INDICATORS			Means of Verification	Risks/Mitigation Measures
	Indicator	Baseline	Target		
and base line establishment; -Terms of Reference for the full ESIA					
Component 4: Studies Coordination and Management					
This comprises management activities necessary to implement the study. This includes a Study Coordination Unit within TANESCO			€ 213,000	Recipient (in kind) (100 %) (8.7% of Total cost)	
<i>Total</i>			€ 2,462,399		
Total AWF net of taxes and duties			€ 1,986,198		Total % AWF (80.7 %)

1. BACKGROUND

1.1 Origin of the project

The African Water Facility (AWF) received requests for funding to support project preparation through Feasibility Studies and Environmental and Social Impact Assessment Studies from TANESCO (The National Electricity Company) and the NIC (National Irrigation Commission) on behalf of the Government of Tanzania (GOT). The TANESCO and the NIC have been supported by CRIDF in developing the project concept for an irrigation project and the development of a hydropower scheme on the Ruhuhu River in the south-west part of the country. The support included preparation of the application to African Water Facility under the Call for proposals for the Preparation of Climate Resilient Water Resources Development Programmes and Projects.

1.2 Previous Assessment and Studies

The Ruhuhu Irrigation project first appeared at the SADC Water Sector Infrastructure Investment Conference which was held in Maseru in September 2011. It also appeared in the SADC Infrastructure Investment Conference that was held in Maputo in July 2013. It is included in the SADC Regional Infrastructure Development Master Plan of August 2012. The project is listed in the COMESA-EAC-SADC Tripartite Regional Infrastructure Project Data base (TRIPDA) dated 20 June 2013 established during the Regional Infrastructure Conference under the item # 838: "Ruhuhu Valley Irrigation Scheme (Project P1-12)". The Ruhuhu Irrigation project is included on the National Irrigation Master Plan.

The proposed site for the dam (for hydropower generation and water storage) was initially identified in the 80's through a scoping study funded by DANIDA, the Danish International Development Agency on behalf of the Ministry of Water. Subsequently in 2013, a team of experts of CRIDF conducted a reconnaissance mission in Tanzania and on the site which led to confirm the basic features of the scheme and its appropriateness for the development of a multipurpose dam project including the development of an irrigated area of 4,000 ha. The Kikonge Hydropower project is now being entered into the Power Supply Master Plan presently under revision.

The envisaged project infrastructures comprise i) an irrigation scheme of 4,000 ha including a derivation weir, the main canal, the downstream command areas, a mini hydropower plant and water supply systems to the local communities and ii) a hydropower scheme including a 120 m high dam, a storage reservoir of 6 billion m³ capacity and 60 km long and a 300 MW power plant and the various appurtenant infrastructures.

The irrigation scheme concept and main features were identified years ago and included in the SADC regional development plan. The hydropower scheme has been recently identified and its main works preliminary designed through a reconnaissance study performed by CRIDF in 2013. Both schemes constitute a multipurpose dam for irrigation, hydropower production and other usages, including at the upstream part of the dam: fisheries, tourism, navigation, irrigation and mining operations.

1.3 Sector priorities

1.3.1 Country Sectoral Priorities

1.3.1.1 Irrigation/Agriculture sector

Agriculture is the basis of Tanzanian economy. It produces about 26.8 per cent of the National Gross Domestic Product (GDP), three quarters of the exports, it is the main source of food supply and provides employment for about 75 percent of the working population.

The main objective of the irrigation sector policy in Tanzania is to ensure sustainable availability of irrigation water and its efficient use for enhanced crop production, productivity and profitability that will contribute to

food security and poverty reduction. While the proposed irrigation project aligns with this focus, it is also in line with Government's policies and strategies on national household food sufficiency, including the "Second National Strategy for Growth and Reduction of Poverty" (NSGRP 2010/2015), the "Rural Development Strategy Dec. 2001", the "Agricultural and Livestock Policy 1997", and the "National Irrigation Act 2013". Additional climate resilience benefits, including significant enhancement if the Kikonge Dam is constructed, will accrue.

Tanzania has an area of 94.5 Mha of land, out of which 44 Mha are classified as suitable for agriculture. Out of the available arable land only 10.1 Mha or 23 percent is under cultivation. Apart from a narrow coastal strip, most of Tanzania is above 200 meters. Tanzanian soils are very varied comprising i) volcanic soils with high agricultural potential and less prone for agriculture soils like, ii) light sandy soils, iii) soils of granite/gneiss origin iv) red soils v) ironstone soils and vi) the Mbuga black vertisols. Agriculture in Tanzania is mainly rain fed and is dominated by smallholder farmers (peasants), cultivating average farm sizes between 0.9 ha and 3.0 ha each. About 70 percent of Tanzania's crop area is cultivated by hand hoe, 20 percent by ox plough and 10 percent by tractor. Food crop production dominates the agriculture economy, with 85 percent of the annually cultivated land being under food crops. Women constitute the main part of the agricultural labour force. The major constraints for agriculture in Tanzania are the decreasing labour and land productivities due to application of poor technology and its dependence on unreliable and irregular weather conditions. This is compounded by low water storage capacities which could reduce impacts of climate changes and irregular rainfalls.

With numerous rivers, lakes and underground water resources, Tanzania has huge potential for irrigated agriculture. Of the total arable land area its irrigation development potential is estimated at 29.4 Mha with varying degree of development potential (National Irrigation Master Plan NIMP, 2002): 2.3 Mha of high potential, 4.8 Mha of medium potential and 22.3 Mha of low potential. The total area currently under irrigation is only 461,326 ha, of which only 363,514 ha (1.2% of the total irrigation potential area) has an improved irrigation infrastructure. This means that an area of 97,812 ha is still under traditional irrigation practice. The main irrigated crops are tea, sugar cane, coffee, flowers, grapes, fruits, maize, paddy, onions, tomatoes, vegetables, spices and pastures.

The country is divided into nine different river basins and annual renewable water resources are currently estimated to be 2,700 km³ each year. This is declining and it is predicted that without implementation of adequate water management projects and storage and flood mitigation infrastructures, the country will soon face a water stress situation. Though there are a number of dams, mostly built between 1950 and 1970, many are now severely silted and some are no longer operational.

1.3.1.2 Energy/Electricity sector

Over the last decade, GOT implemented numerous reforms in the energy sector to support its policy objectives of ensuring the financial viability of the sector; reducing the cost of power generation; and increasing energy access; but the results are mixed. The National Energy Policy of 2003 is also currently under review. The recently endorsed Electricity Supply Industry Reform Strategy and Roadmap is the latest step in GOT's efforts to reform the sector.

Tanzania's current nationwide access rate to electricity is at 24%, this is very low compared to countries in North Africa and South Africa. The connectivity rate is much lower for rural Tanzania. TANESCO's heavy reliance on liquid fuels, which is expensive and vulnerable to price shocks, explains the high cost of electricity service in Tanzania. Moreover, dependence on 6 hydropower plants which are mainly of run-off the river type makes TANESCO production vulnerable to weather patterns. In order to offset inadequate production of hydroelectricity, TANESCO has been forced to increase the share of liquid / fossil fuel based power generation. This has resulted in an unsustainable energy mix, which poses a major challenge.

The capacities of the Tanzanian electricity system are the following: The installed capacity in the main grid is 1,500 MW. (hydro: 562 MW (37%) and 940 MW (63%) from thermal plants. Capacity of thermal plants (Gas: 501 MW: Fuel Oil: 440 MW) is mainly from IPP. Off-grid stations total capacity is 78 MW. Highest grid system demand was recorded in November 2013 at 900 MW. Transmission network comprises of 2,700 km of system voltage 220 kV; 1,600 km of 132 kV and 580 km of 66 kV, totalling 4,900 km by the end of November 2013. Distribution System comprises of 17,000 km of 33 kV lines, 5,500km of 11 kV lines, 35,000 km of LV and 11,124 distribution transformers. On October 9th 2015, the Ministry of Energy publicly announced that most of the hydropower plants, representing 35% of the country total generating capacity have been switched off due to the low level of water due to absence of rain for a long period. As a consequence, the power sector is currently characterized by exceptionally high demand in the face of limited supply.

TANESCO has entered into a number of short term supply contracts with privately owned Emergency Thermal Power Plants (EPPs) which are relatively expensive. While these interventions have helped to increase generating capacity, they came at a very high unit cost (from 10 US \$ cents per kilowatt hour in 2010 to 20 cents per kilowatt hour in 2013). TANESCO operations became financially unsustainable, as a result of emergency power supplies, imported liquid fuels, among other factors. It is recognised that a more sustainable solution is required, hence the need for power sector reform requiring that the energy mix is diversified in the medium and long term, while addressing climate change considerations and attracting private sector participation. In this regard, the planned revision of the National Energy Policy will address the promotion of renewable energy for sustainable development.

In June 2014, GOT approved and published the Electricity Supply Industry Reform Strategy and Roadmap 2014-2025, aimed at removing structural weaknesses, addressing inefficiencies and enhancing private sector participation in the power sector. The Strategy and Roadmap was prepared under a technical study financed by the Bank. The reform efforts will focus on turning around TANESCO, creating business units along functional lines, establishing an Electricity Infrastructure Procurement Coordinator, a Task Force and a Change Management Team. It targets actions aimed at reducing system losses from 18% to 19% (June 2015), ring-fencing distribution system into seven semi-autonomous zonal offices, developing technology based standard PPA, and designating Grid Control system with TANESCO as an Independent System Operator.

1.3.2 Sectoral Priorities for the AWF/Bank

As a water management infrastructure project for multi-usages, the proposed project is well aligned with AWF 2012-2016 strategy which focuses on the preparation of bankable projects aiming at mobilising and managing water resources including resilience to climate change effects. More specifically, funding the feasibility studies of the Kikonge project should catalyse further resource mobilization and commitments from others for funding the downstream investments. When the pre-feasibility studies and the full feasibility studies are funded a leverage effect of approximately 1/130 will be achieved.

The Bank Group support to Tanzania under the 2011 – 2015 strategy is anchored in the selectivity principle and rests on a single overarching theme of *supporting Tanzania towards greater competitiveness and more inclusive growth*. The Strategy also aims to support the country benefit more from regional integration and trade. The Country Strategy Paper has retained two pillars: infrastructure development *and* building an enabling institutional and business environment. The Bank aims to strongly focus on infrastructure as an enabling sector for socio-economic growth.

Under the 2011-2015 CSP, the Bank support in *infrastructure* focuses on: (i) development and rehabilitation of critical socio-economic infrastructure (energy, transport, water); and (ii) increased agricultural productivity as priority areas of the Medium Term Strategy.

In the energy sector, Bank involvement is through a multi donor-funded Rusumo Falls Hydroelectric and Multipurpose Project. The project objective is to develop renewable hydroelectricity and regional transmission

lines connecting Burundi, Rwanda and Northwest Tanzania. It will also support local area development and benefit-sharing activities in the area of the dam and reservoir. Currently, the Bank is co-funding with 50 Million of UA (The first of 3 operations in a programmatic series covering the period 2014/15– 2016/17) the Power Sector reform and Governance Support Programme (PSRGSP). The programme supports Government's power sector reforms and TANESCO transformation and particularly the reform measures geared towards enhancing the economic and financial viability of the power sector and promoting private sector participation. Components and expected outputs of the programme at the 2017 horizon specifically relate to reduce the number of costly Emergency Power Plants EPP to be replaced by generation from renewable resources, creation of incentives for private investments in the power sector with streamlining institutional arrangements for PPPs, including approval of Model Power Purchase Agreements - PPAs for renewables.

In the agriculture sector, Bank's interventions in favour of the agriculture sector infrastructure support the *Kilimo Kwanza* initiative through a Project and participation in a Sector Budget Support. Support under the MIVARF project will focus on rural infrastructure development. The Bank has joined other Partners in financing the second phase of the agriculture sector basket fund to consolidate the gains of the earlier phase, including national irrigation development. In addition to its financing, the Bank also leads the dialogue with the GoT under this framework. The Ruhuhu project has also been prioritised by the Government of Tanzania under an ambitious programme of Big Results Now, coordinated by the National Planning Commission, across the economy.

1.4 Problem definition

1.4.1 Agriculture sector

The area of the project lies in the west-southern part of the Tanzanian territory, close to the shores of the Lake Nyasa. The Ruhuhu River with a catchment area of 14,070 km² (Part of the larger Zambezi basin) with a long term annual average runoff of 430 mm is the largest river flowing to Lake Nyasa contributing to 20 % (equivalent to 6.03 km³) of the total lake annual inflow. There is only one rainy season in the basin between November and May. In this region, crop production is currently dominated by rain fed systems leaving the irrigation potential marginally tapped. Therefore, irrigation has been identified as one of the key activities for boosting agricultural productivity and for providing additional revenues to local farmers and populations. Through the Tanzania Five Year Development Plan 2011/2012 – 2015/2016, the Government targeted to expand, at the level of the national territory, the area with developed irrigation infrastructure to a cumulative area of 1 million ha by the year 2015. The targeted area for development is for all levels from small scale, medium and large scale irrigation schemes to be owned and managed by either smallholder farmers or commercial medium and large scale farmers. The Ruhuhu Irrigation project is well placed to support the implementation of the GoT policies and strategies.

Currently, apart from a small irrigation scheme at Ngingama village, there is no irrigation infrastructure across the three wards that the Ruhuhu Irrigation project will concern. Farmers rely on rain fed agriculture, and small scale irrigation using local facilities, such as buckets and watering cans to irrigate their small gardens of vegetables. The irrigation scheme at Ngingama is not effectively functioning and there is under-utilisation of its potential by 50%. Lack or weak mechanism and low motivation and skills of users for maintenance of the canals is the biggest reason for the irrigation systems' poor performance.

1.4.2 Power sector

One of the main challenges for Tanzania is to foster its economic growth and reduce poverty. To supply electric energy in sufficient quality and quantity will support the Government in these challenges. Currently shortage of power supply is critical and it is compounded by various factors like inappropriate energy generation mix. The mix is, mainly constituted of thermal plants with extremely high operation costs and

hydropower plants of the run-off the river type, highly vulnerable to drastic variations of water availability as a consequence of climate changes. Given that TANESCO has no significant (hydropower) generating capacities in the south west part of the country, the Ruhuhu project will be a response to this territorial unbalance as well as a strategic connecting point within the regional interconnection system and electricity market which will be shared with neighbouring countries. Developing new electricity generation plants, with emphasis on renewables is duly incorporated in both the short and long term objectives articulated in several national plans as follows:

Tanzania's Power System Masterplan 2012 Update (The Masterplan) estimates that additional demand for peak power and net generation by 2020 would be 2,192 MW and 12,140 GWh respectively, requiring increase in power supply sources. Further, the Government is targeting 30% connectivity by 2015, involving connection of 250,000 new customers per annum over 2013 to 2017.

Tanzania's Five Year Development Plan 2011/12 to 2015/16 aimed to increase electricity generation capacity from 1,117 MW to 2,780 MW and increase consumption from 81 kWh per capita to 200 kWh. Current results are unfortunately lagging behind these objectives.

Tanzania Development Vision 2025 targets a long-term average annual GDP growth of 8% by 2025, with emphasis on infrastructure development, power generation being one of the main contributing factor.

Tanzania National Adaptation Plan of Action notes that Tanzania has an estimated 4,800 MW of hydro potential capacity, but only 561.8 MW has been installed, mainly of run-off the river type highly sensitive to climate change and recommends the protection of hydro water catchments.

1.5 Institutional situation

1.5.1 Agriculture and Irrigation

The Ministry of Agriculture, Food Security and Cooperatives (MAFC) has a mission to deliver quality agricultural and cooperative services, provide a conducive environment to stakeholders, build capacity of local government authorities, and facilitate private sector contribution to sustainable agricultural production. Specific Divisions and Sections deal with agricultural land use planning and management.

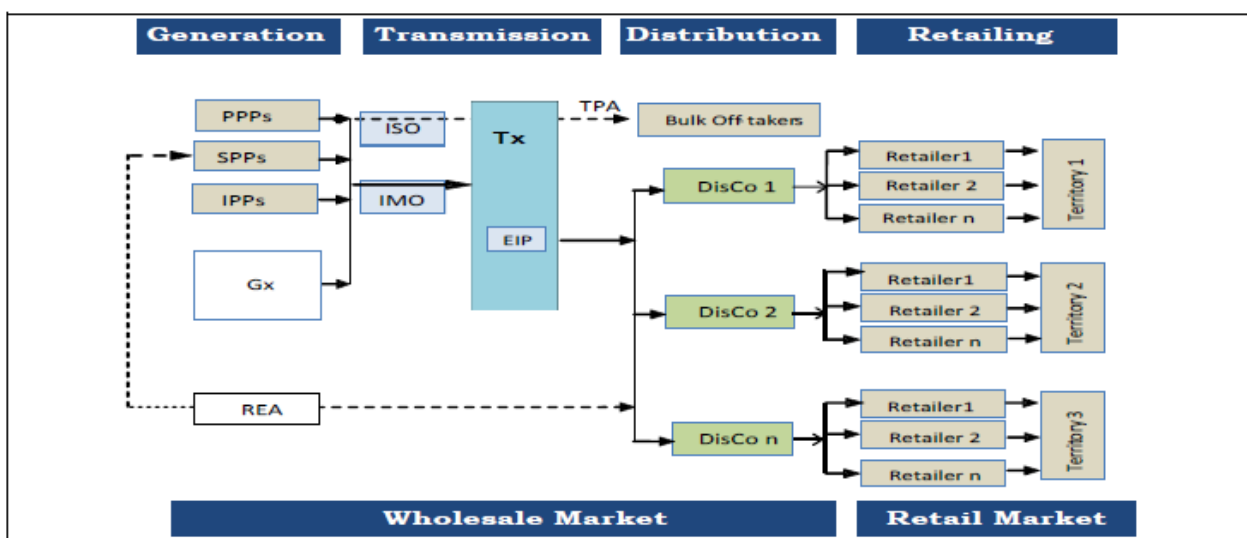
In 2013, under the National Irrigation Act, the National Irrigation Commission (NIC) was established to provide for the development, operations and maintenance of irrigation and drainage system and to provide for the effective implementation of the National Irrigation Policy and the National Irrigation Development Strategy. The NIC is an independent department of the Government under the Ministry of Agriculture, Food Security and Cooperatives responsible for irrigation. It is responsible for coordination, promotional and regulatory functions in the development of the irrigation sector. More specifically, among various functions and advisory services to the Line Ministry and through ad hoc Committees the NIC i) coordinates all interventions in the sector conducted by the development partners and other stakeholders ii) plans, carries out studies, designs, construct and administer implementations of irrigation projects and iii) promotes development of multipurpose water storage facilities for irrigation purposes and other social economic activities. Officers of the NIC will be part of the Study Coordination Unit for the Ruhuhu multipurpose dam, irrigation and hydropower project feasibility study established at the Executing Agency (TANESCO).

The Ministry of Water and Irrigation (MoWI) is principally responsible for water resources development and water supply, water resources, and irrigation in Tanzania. Its main function is to ensure that water resources are developed and managed sustainably in collaboration with all stakeholders. It also facilitates participatory water use for irrigation so as to enhance sustainable productivity, food security, poverty reduction and achieve national economic development. It is in charge of implementing the National Water Sector Development Strategy (NWSDS) in compliance with the Water Resources Management Act No 11 of 2009. The Act provides the institutional and legal framework for the management and development of water resources from

the lowest to the highest level. The ministry is also responsible for implementing Tanzania’s international obligations as per various agreements such as the Zambezi River Basin Commission.

1.5.2 Energy/Electricity

In Tanzania, the Ministry of Energy and Minerals (MEM) is responsible for the implementation of set policies, strategies and laws for sustainability of energy and minerals resources to enhance growth and development of the economy. Hydropower resources mobilization and development fall under the scope of responsibilities of the MEM. The 2015 Draft Energy Policy designates one of its strategic areas that is to promote, develop and monitor the energy sector to maximize national benefits and ensure energy security. This strategic area focuses on increasing power generation, distribution and transmission; developing alternative sources of cleaner; new and renewable energy sources; and promoting energy efficiency and conservation. Various Acts govern the energy and electricity sector like the Electricity Act, the Rural Electricity Act, and the Environmental Impact Assessment (EIA) Guidelines-Energy Sector, 2012, and thus provides the institutional framework for the development of electricity (hydropower)/generation projects. To note that the Electricity Act specially assigns the responsibility to the MEM *to take all measures necessary to reorganize and restructure the electricity supply industry with a view to attracting private sector and other participation in such parts of the industry, phases or time frames as it/he deems proper*. The said reorganization and restructuring is currently in progress with the support of the Bank to the Power Sector reform and Governance Support Programme (PSRGSP). According to the Road Map associated to the Electricity Supply Industry Reform Strategy, the market at the long term (2025) will be as illustrated in the following chart.



Tanzania Electric Supply Company Limited (TANESCO) is a parastatal organization under the Ministry of Energy and Minerals. The TANESCO mission is to generate, transmit and supply electricity in the most effective, competitive and sustainable manner possible. TANESCO owns most of the electricity generating, transmitting and distributing facilities in Tanzania Mainland. By 1999 the government decided to unbundle and privatize TANESCO to promote efficiency, private sector participation and introduction of competition in electricity market. TANESCO’s Generation division is responsible for all power generation functions owned by TANESCO. Other sources of generation are from independent power producers (IPPs) which feed the National grid and isolated areas as well. TANESCO’s generation system consists mainly of hydro and thermal based generation. Hydro contributes the largest share of TANESCO’s power generation. The hydro-plants operated by TANESCO are all interconnected with the national grid system and their installed capacity is totalling 561 MW. TANESCO has been implementing power generation mix program, whereby a substantial amount of generation comes from thermal generation through own generation and independent power plants

(IPPs). There are also several diesel generating stations connected to the national grid in Dar es Salaam and other cities/regions of the country.

The Energy and Water Utility Regulatory Authority (EWURA) is responsible for technical and economic regulation of the electricity, petroleum, natural gas and water.

The Rural Energy Agency (REA) is responsible for promoting modern energy services in rural areas.

1.5.3 Private sector participation in the infrastructure sector

A huge volume of infrastructure is needed to meet the MDG's and other socio-economic development objectives of the country. The Tanzanian government has realized that the role of private sector in bringing socio-economic development through investments in infrastructures must be explored as a potentially important option. For this purpose, the legal and institutional framework has been adjusted to allow for the private sector to become an important player in the infrastructure sector development. Public-Private Partnerships (PPPs) have been identified as viable means to effectively address constraints of financing, management and maintenance of public goods and services. A specific policy has been developed in 2009 under the form of the National Public Private Partnership (PPP) Policy. All sectors are now opened for the development of PPPs, the agriculture and the electricity production sectors, major components of the Kikonge multipurpose dam project, being promoted in order to contribute to the achievement of the Millennium Development Goals, the National Development Vision 2025 and the National Strategy for Growth and Reduction of Poverty (NSGRP) goals. The PPP sector is currently governed by the Public Private Partnership Act of June 2010, The Public Private Partnership (Amendment) Act of May 2014 and follows the rules of the Public Procurement Act (PPA) No. 21 of 2004. The studies and technical assistance provided by CRIDF will develop the Financing Plan for Implementation of the Kikonge project with due consideration of the opportunities for promoting PPPs within the existing policy framework.

1.6 Lessons from past experiences¹

The Bank's portfolio in Tanzania comprises 27 operations, at March 2015, with a total commitment of UA 993.04 million, in infrastructure (energy, transport and water supply and sanitation), agriculture, human development, private sector and multi sector, including budget support. The Bank is also supporting capacity building in enterprise development, policy and strategy development. In collaboration with the Africa Legal Support Facility (ALSF), the Bank is providing expertise in negotiation of complex investment transactions. The sectoral composition of the portfolio is aligned with the CSP pillars, with emphasis on infrastructure. For public sector operations, transport takes the lion's share (42.1%), followed by multinational (mostly transport and energy) (17.7%), social sectors (13%) water supply and sanitation (12.7%), energy (9.1%), and agriculture (5%). Private sector operations account for 15.8% of the portfolio.

Lessons have been learned from past and ongoing Bank's operations which have yielded positive results. The key lessons from the mid-term review conducted in on the current CSP include the need to (a) continue to finance relevant knowledge and advisory products, to inform operations and contribute to policy dialogue and programming; (b) strengthen the measurement of results, and enhance project selectivity by focusing on few areas with high development impact; and (c) pay more attention to quality-at-entry during project design, and strengthen oversight and project supervision. Other lessons include need to (i) minimise the number of disbursement conditions; (ii) narrow programme focus to the most critical areas; and (iii) ensure strong ownership of reforms by GOT. These lessons have been taken into account in evaluating the Ruhuhu multipurpose dam, irrigation and hydropower project.

¹ Recent analysis and statements from the PAR established in May 2015 for the Power Sector Reform and Governance Support Programme (PSRGSP) funded by the Bank.

The proposed feasibility study and the future implementation of the project infrastructure will complement the Bank's past and on-going operations, particularly those in energy sector and the agriculture sector. In this last sector, the Bagamoyo Integrated Rural Infrastructure Development Sugar Project (BIRIDESP) is under progress. The commercial project will produce approximately 800,000 tonnes of sugarcane annually on 7,800 ha under irrigation and will consist of a sugar mill with an annual production of 132,000 tonnes of sugar, 10 million litres of ethanol and 32 MW of electricity (with the surplus being supplied to the national grid). Most sugarcane operations consist of a commercial/industrial estate and an out-grower scheme. The out-grower scheme will commercialize smallholder farmers on 3,000 ha of land surrounding the industrial estate. At full capacity, the out-growers are expected to produce 300,000 tonnes of sugarcane per year that they will sell to the estate to be crushed for sugar and energy production. This will benefit the surrounding community and incentivize commercial out-growers by guaranteeing the off-take of farm production.

The AWF is currently funding (jointly with the NEPAD IPPF) the detailed design and implementation of the Songwe River Basin Development Programme (SRBDP) aimed at supporting economic growth and poverty alleviation in the entire basin shared between Tanzania and Malawi. The project infrastructures include hydropower plants, irrigation schemes, river course stabilisation works, flood control, water supply, fisheries and fish farming and roads and river crossings. The corresponding scope of the studies for these infrastructures comprises: i) Updating Feasibility Study, Detailed Design and Preparation for Capital Investments; ii) Strategic Environmental & Social Assessment (SESA) and Environmental & Social Impact Assessment (ESIA); and iii) Institutional Development for Establishment of a River Basin Commission (RBC) and SRBC Business Plan and capacity building for IWRM.

1.7 Beneficiaries and stakeholders

The beneficiaries of the project are the 15,000 people living in communities in the vicinity of the project area who will be supported to improve their livelihoods and thereby engender socio-economic growth from the integrated development of the water resources of area and the regulation of the Ruhuhu River flow by the dam and associated reservoir. The regulation of the flow into the Lake Nyaza will potentially have significant positive impact on the Lake Nyasa by reducing the amplitude of its level of fluctuation.

The direct beneficiaries of the study are the Ministry of Agriculture, Food Security and Cooperatives MAFSC and the National Irrigation Commission NIC, the Ministry of Energy and Mines MEM and TANESCO the national electricity company. The implementation of this project will substantially contribute to increase the water availability for multiple uses for the populations in the area (irrigation, water supply, electricity). It will also benefit the productive socio-economic actors in the various sectors of industry, agriculture, trade and tourism at the national level by increasing the country hydropower capacity by 53%.

1.8 Justification for AWF support

The project is aligned with AWF 2012-2016 strategy pillar I, preparation of bankable projects. More specifically, the execution of the feasibility study of a multipurpose dam, irrigation and hydropower project including activities for mobilisation of funds for the next stage of detailed feasibility, detailed design and tender dossier and the execution of the full ESIA should catalyse further resource mobilization and commitments from other donors for funding the downstream investments.

The implementation of the investment project will be very effective as a climate change adaptation and mitigation measure, which is an important element in AWF strategy of supporting Climate Change adaptation projects. In terms of the adaptation the project will contribute to increased food and water supply security and increased flood protection. In terms of mitigation the project will limit the carbon emission by reducing the use of fossil fuels for electricity production.

When the pre-feasibility studies and the full feasibility studies are funded a leverage effect of approximately 1/130 will be achieved. Other aspects of the project related to the objectives of AWF's strategy are:

- AWF's involvement in funding the feasibility study of the project guarantees the project's "quality at entry" and leaves ample room to better assess the transversal aspects, namely i) gender, ii) social equity, iii) environment, iv) climate change and v) transboundary/regional integration.
- On the environmental aspect, by financing the pre-feasibility studies and the Strategic Social and Environmental Assessment (SSEA), the AWF will keep a constant watch over the proper design and implementation of water resources and environmental protection measures and the reduction of impacts in the areas affected by the project.

2. The Project/Study

2.1 Goal, Impact and Outcome

Goal: The overall goal of the multipurpose project is to foster the socio-economic development of the local populations in the area and at large to contribute to the economic growth of the country. The project will enable optimisation of multipurpose water use of the Ruhuhu River water resource through the participatory development of an agro-irrigated scheme and a hydropower dam with associated reservoir. This will involve improving the knowledge and analysis of water use for various purposes, demands on water resources, an understanding of the social and environmental issues. The proposed studies will provide the baseline for further activities of final design with the mobilisation of required additional funds as well as the road map for the investments for the project infrastructures implementation and operations.

Impact: The long term impact of the project will be improved socio-economic development, enhanced livelihood and environmental quality in the area and to increase the resilience towards the effects of climate change. This impact is achieved through the development of irrigated agriculture for the benefit of local farmers and stakeholders and by increasing food security and trade at the larger scale of the country and possibly at regional level. The preliminary design has identified 4,000 ha of potential irrigated land for cultivation of various crops. The hydropower scheme with an annual hydropower potential of about 1,300 GWh and a reservoir capacity capable of storing and regulating up to 1.3 times the annual run-off of the basin can provide a response to the challenge facing the electricity sector in Tanzania. Contrary to the majority of hydropower plants of the run-off the river type highly sensitive to rainfall variations, the Kikonge hydropower scheme can significantly contribute to improve the quality and the security features of the country energy mix. The multipurpose type of the dam also dramatically improves the resilience to climate change by regulating the flow of the Ruhuhu River allowing to have water available all along the year instead of depending on the rain season inflows and by reducing the impacts and damages of floods on infrastructures and economic activities. By regulating the flow of the Ruhuhu River representing 20% of the total water inflow to the Lake Nyasa, the project will reduce the seasonal fluctuations of the lake level with positive impacts on the ecological features of the lake shores and on the flow of the Shire River which is the only Lake exit to the downstream other riparian country (Mozambique).

Outcome: The Outcome of the study is the increased investment in climate resilient projects specifically in multipurpose dams including hydropower, irrigation and water supply. The study outcome shall be materialised in 2017/18 with the mobilisation of € 2.5 million to complete the full feasibility study, and subsequently to mobilise financing for the implementation of the multipurpose dam project.

2.2 Outputs

The main outputs of the Project/study are: i) the provision of a comprehensive pre-feasibility report covering all aspects of a multipurpose dam project; ii) the provision of a Strategic Social and Environmental report constituting the road map for the further comprehensive Environmental and Social Impact Assessment studies (ESIA); iii) the provision of detailed terms of reference for a) the next phase studies comprising Final Design and Tender Documents, b) the ESIA studies, c) the Agro-development strategy, d) the consultative and participative process for the implementation and operations of the agro-irrigation component; iv) the

mobilisation of additional funds for conducting those studies; and v) the awareness and sensitization of financiers for the investment funding of project infrastructures.

2.3 Feasibility components and activities

The proposed feasibility is a first phase of a comprehensive process. This process will benefit from access to data and information from previous identification and reconnaissance activities. It is a critical segment of the whole activities aiming at triggering additional financial resources to pursue the development of the multipurpose project through the phases of feasibility and full ESIA studies, final design, tender dossier and mobilisation of capital funds for implementation, construction and operations.

The study activities will be carried out to feasibility level. A few activities that cannot be fully completed in this phase. These activities mainly include the Detailed Design of the various infrastructure elements and Agro-Development Strategy studies. The Feasibility Studies will be the link to the Agro-Development Strategy, which will be carried out just before the Detailed Design, in order to ensure an optimal solution. A key activity during the study will be to mobilise additional funding to secure completion of these other activities.

One important output of the feasibility study will be the establishment by the Consultants of the Terms of Reference (ToR) and costs estimates for the further studies, namely: i) ToR for the remaining study activities and detailed design; ii) ToR for the ESIA Studies; iii) ToR for implementing a comprehensive consultative process for the implementation of the agro-irrigation component; and iv) ToR of the Agro-Development Strategy studies. The chart below illustrates the process as well as the phase of pre-feasibility and SSEA that the AWF and CRIDF are currently proposing to finance.

Project Development Chart				
Time line	Phase	Status	Actors	Funding
Past ↓	Identification and Reconnaissance	Done	DANIDA Consultant	DANIDA
			SADC	
			CRIDF	CRIDF
(Current Period) 15 Months ↓	Pre-Feasibility Study, Strategic Social & Environmental Assessment	Under Evaluation	AWF CRIDF TANESCO NIC	AWF CRIDF Recipient (In kind)
	Funding Mobilisation for Further Studies	Part of the Pre-Feasibility Study		
18 Months (est.) ↓	Feasibility Study, Final Design, Tender Dossier, Full ESIA	Prospective	Interested Donors	Interested Donors and Private Sector
60 Months (est.) ↓	Implementation	Prospective	Interested Donors	International Donors
	Construction		TANESCO	Private Sector/ Banks and ECA's
			NIC	Tanzanian Government
	Operations		Other Tanzanian Agencies	Infrastructure Funds
				Climate Change and Renewables Development Funds

The feasibility studies and the SSEA will cover the whole project as a multipurpose dam, irrigation, water supply and hydropower project. The main infrastructure works in the investment project are the irrigation scheme, the dam and its reservoir and the associated hydropower plant and the high voltage transmission line. In addition, this study will also encompass the other uses like: water supply to local communities, local electricity supply through a mini hydro-power plant, the fishing activities, the tourism development and the other uses of water for activities in the reservoir area (navigation, transport and water for mining process).

The feasibility and SSEA studies will be rolled out in several phases broadly described hereafter and detailed in the attached terms of reference:

2.3.1 Component 1: Feasibility study

2.3.1.1 General Scope of the Feasibility studies

The general scope of the studies is composed of 5 phases as described below:

- Phase 1: Data and information collection

These activities are common for the irrigation and the hydropower aspects. They cover the collection of data and information and the consultation of previous studies reports.

- Phase 2: Site reconnaissance and investigations

This phase will proceed with a visit of the proposed identified sites for the infrastructure works and a general appraisal of the local environment and socio-economic features of the area.

The technical investigations will comprise the appraisal of the topographical, geologic and geotechnical aspects of the project sites. The topographic investigations will allow to establish maps with the adequate scale and accuracy for assessing the extent of the irrigation area, the profile of the river bed at the proposed location of the dam and weir and the extent and capacity of the reservoir for various impoundment levels.

The hydrological study of the catchment area of the Ruhuhu River will determine the available water resource, the river regime and the floods patterns. The study will also cover the water resource management aspect related to the impacts of the reservoir/dam/hydropower plant operations on the water level in Lake Nyasa and the flow into the Shire River.

- Phase 3: Techno-economic studies

This phase will comprise the technical and economic studies for assessing the feasibility of the project as a multipurpose scheme comprising the irrigation component, the hydropower component and the other peripheral sub-projects for other water usages. An outline design will be developed, on the basis of previous orientations proposed during the previous studies (CRIDF study reports). Sketches and drawings illustrating the locations of the works, their basic dimensional and capacity features will be established allowing for estimating the quantities of works and their costs. During this phase, computations for a cost/benefit ratio analysis will be performed.

- Phase 4: Drafting of Feasibility Studies Terms of Reference (ToR)

Under this phase, the Consultant will establish the ToR for further studies as follows:

- ToR for the full Feasibility Study and Final Design of the project including the preparation of the Tender Dossier for implementation.
- The ToR for implementing a comprehensive consultative process based on a participatory approach with all stakeholders and beneficiaries for defining the most appropriate institutional and operational set-up of the agro-irrigation component.
- The ToR for an agro-development strategy for establishing the cultivation and crop patterns offering the maximum of revenues and rewards to the beneficiaries.

For each of these ToR/studies the Consultant will estimate the volume of required efforts (number of experts' man-months and required profiles), the associated costs and expenses and the corresponding execution calendar.

- Phase 5: Promotion of the project and mobilisation of funds for the Full Feasibility Study

The activities under this phase will be developed all along the duration of the feasibility study in order to present and promote the project to other donors in view to mobilise funds for the performance of the next stage of Full Feasibility Study and detailed ESIA studies as well as to assess the interest of financiers and private sector operators for financing the investments, and encourage the inclusion of the project in the pipeline of the financing institutions.

The Terms of Reference (Annex to the present PAR) for the studies detail the various tasks to be performed by the Consultant in various domains.

2.3.2 Component 2: Other studies and technical assistance

The activities under this component are funded and performed by CRIDF with due coordination with the Consultants in charge of the pre-feasibility and SSEA studies. The activities comprise i) Climate resilience assessment of the project, ii) technical assistance and advisory services relating to the International

Notification process for transboundary shared water bodies and iii) financing strategy and plan for implementation.

The detailed specific scope of interventions funded by CRIDF is provided in Annex 10.

2.3.3 Component 3: Strategic Social and Environmental Assessment (SSEA)

In compliance with the laws and regulations of The United Republic of Tanzania regarding socio-environmental impacts of large infrastructure project, a Strategic Environmental (and social) Assessment will be established for the whole multipurpose project in close collaboration with the relevant Tanzanian authorities.

2.3.3.1 General Scope of the SSEA Studies

The Strategic Social and Environmental Assessment will comprise 3 phases.

- Phase 1: Public Consultation Strategy

During this phase and in consultation with the Tanzanian Authorities responsible for environmental matters, the Consultant will develop and implement a Public Consultation Strategy (PCS). The implementation of this strategy will provide the public and other stakeholders with comprehensive relevant information about the project and its intended impacts on communities and resources.

- Phase 2: Scoping study and base line establishment

This phase will be performed in accordance with the practices applied in Tanzania. The assessment will determine the various possible impacts induced by the project implementation and will tentatively classify them with regard to their order of importance and difficulty for mitigation.

- Phase 3: Terms of Reference for the full Environmental and Social Impact Assessment study (ESIA)

The Consultant in charge of the SSEA and on the basis of the findings will establish the ToR for the further performance of the full detailed ESIA study. These ToR will be required to be approved by the relevant Tanzanian Authorities.

The detailed scope of the SSEA studies is defined in the corresponding Terms of Reference annexed to the present PAR.

Special note on the possible impact on fishing activities: During the appraisal mission, it was observed that a significant fishing activity exists on the Lake Nyasa and along the Ruhuhu River, this activity bringing an important amount of proteins to the diet of local populations as well as significant revenues and job opportunities. The main catch is *Opsaridium Microlepis* (locally known as Mbasaa) which is endemic to Lake Nyasa (Jackson et al., 1963; Tweddle, 1987) and the species is mostly caught while on spawning runs in large rivers, the Ruhuhu River being the most important. *O. Microlepis* is a pelagic economically important cyprinid in Lake Nyasa area, however, the catches of *O. Microlepis* have declined tremendously and it is now regarded as a threatened species. The species was found to make spawning runs in the rivers during the dry season when the water turbidity was low. In the Ruhuhu River the species makes these runs during the dry season, a fact which is different from Malawi Rivers where spawning runs take place during the rainy season. It is not known what factor(s) cause the same species to spawn in Malawi Rivers during the rainy season. The very high turbidity in the Ruhuhu River during the rainy season appears to be the main determinant which makes the species to make spawning runs during the dry season. This phenomenon seems to be compounded by the high turbidity of the river prevailing even during the dry season as a result of uncontrolled upstream activities and practices (Alluvium gold mining, improper agricultural practices, deforestation and inexistent water catchment basin management and protection).

In the light of the above, the SSEA studies will specifically consider this subject and develop preliminary investigations and research on the possible mitigation measures for maintaining this source of high value food once the project is implemented.

2.3.4 Component 4: Studies Coordination and Management

This component comprises the management activities necessary to implement the study (including the SSEA study). The management of the study/project will be assured by an ad-hoc Study Coordination Unit (SCU) set up within TANESCO, under the guidance of a Study Coordinator fully dedicated to the project. The tasks of the SCU will include but not be limited to: procurement activities for recruiting the Consultants, coordination of the studies, dialog with the Consultants, assistance support and facilitation to the Consultants' activities, organisation and management of relationships with the Steering Committee and the Consultative Committee, communication and promotion activities on the project, promotion of the Donors' roundtable, financial management and audits.

This component funded by the recipient will cover the overall management of the project/ including:

- Activities and salaries of the Executing Agency (SCU) staff involved in the project;
- Study Coordinator (to be designated) activities;
- Planning and coordination of Steering and Consultative Committees meetings;
- Provision of office space and corresponding running costs.

2.4 Risks and mitigation measures

The main risks identified that may hinder the performance of the feasibility study and their corresponding mitigation measures are as follows:

Risk: The Executing Agency cannot mobilize its counterpart for assuring the management of the project/studies.

Mitigation measure: The evidence of the set-up of the Study Coordination Unit (SCU), the designation of the Study Coordinator and of the Procurement Specialist acceptable by the Bank are conditions for the first disbursement.

Risk: Completion of the study may be delayed by opposition from potentially impacted populations and civil society.

Mitigating measure: This risk is mitigated through the consultative approach developed (Consultative Committee) and the performance of the Strategic Environmental Assessment (SEA), which will identify all potential environmental and social impacts. The community involvement processes will be critical in mitigating this risk.

Risk: Riparian states opposed to the project.

Mitigating measure: The Technical Assistance provided by CRIDF relating to the International Notification Process for shared water bodies will support the Government's consultation with other riparian countries. This TA will help the Government preparing the required consultation document and addressing the riparian countries comments.

2.5 Costs and financing plan

The total estimated cost of the feasibility studies and SSEA studies is estimated at **€ 2,462,399** net of taxes and duties (including a 5% contingency reserve on donors' contributions only). A cost breakdown is presented in the table below and more detailed in Annex 2. AWF's share is **€ 1,986,198 (80.7%)**, the share of CRIDF is **€ 263,200 (10.7%)** and the in kind contribution from the Government of Tanzania is estimated as **€ 213,000 (8.7%)**.

The main study costs consists of the payment for consultancy services to undertake the Feasibility Study, the Strategic Social and Environmental Assessment (SSEA) and other studies and technical assistance by CRIDF together representing 91.35% of the study costs.

Table 2.5.1 Estimated study cost by Component (in Euros)

Component	Funding Source			
	AWF	CRIDF	GOT	Total
Component 1: Pre-Feasibility / Feasibility Study	1,746,751			1,746,751
Component 2: Other studies and Technical Assistance		263,200		263,200
Component 3: Strategic social & Environmental Assessment	239,447			239,447
Component 4: Study coordination and management			213,000	213,000
Sub-totals	1,986,199	263,200	213,000	
Study cost / Total				2,462,399
Study cost / Percentage	81%	11%	9%	100%

Table 2.5.2 Estimated study cost by category of expenditures (in Euros with 5% contingency on donors contributions only)

Category	Funding Source			
	AWF	CRIDF	GOT	Total
Works	N/A			
Goods	N/A			
Services				
Consultants	1,387,575	211,575		1,599,150
Air travel	61,425	15,015		76,440
allowances	160,296	32,721		193,017
On site transport	29,353	3,890		33,243
survey and Investigations	320,250			320,250
Financiers roundtable	27,300			27,300
Services sub-total	1,986,199	263,200		2,249,399
Operation				
Study Manager and Procurement specialist			135,000	135,000
Office space and running od office			78,000	78,000
Operation sub-total			213,000	213,000
Grand total	1,986,199	263,200	213,000	2,462,399

3. Implementation

3.1 Recipient and Executing Agency (EA)

The Government of Tanzania will be the beneficiary of the grants, TANESCO and NIC will be the recipients. TANESCO will be the Executing Agency and the Study Coordination Unit (SCU) staffed with officers of the 2 organisations will be located at TANESCO.

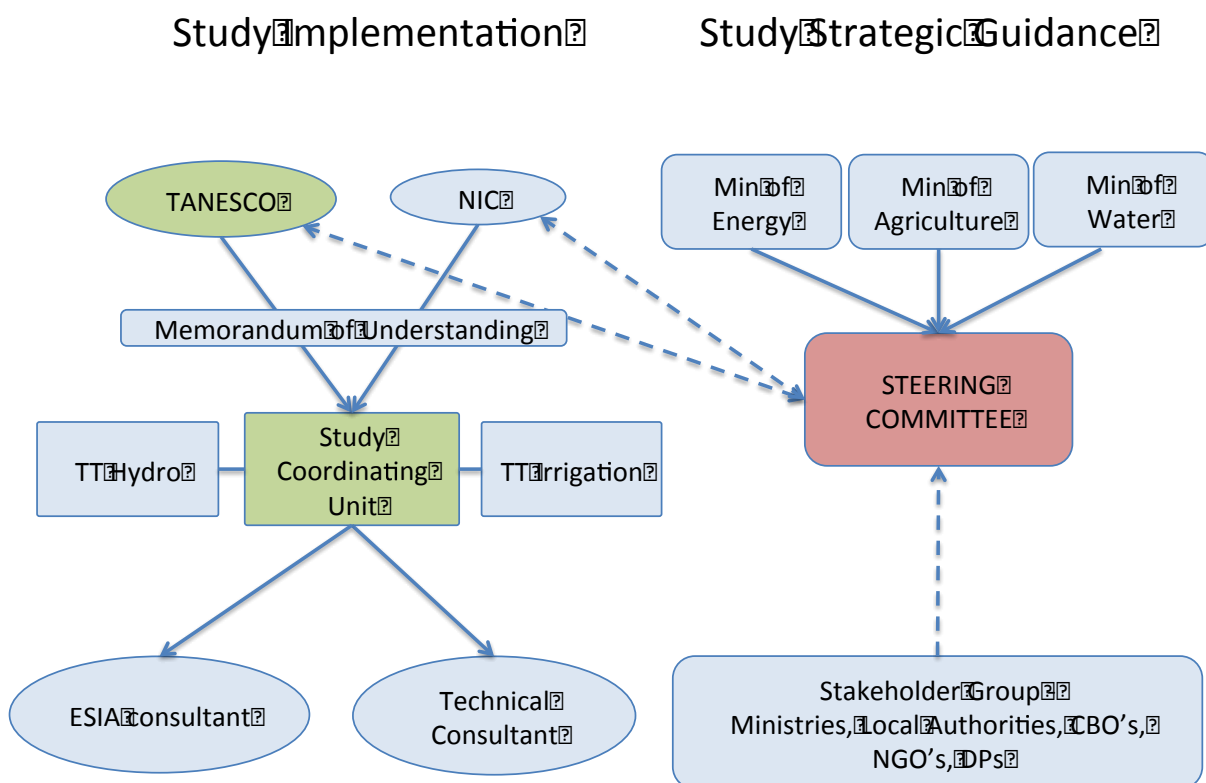
3.2 Implementation arrangements

Both TANESCO and NIC have previous and on-going experiences of Bank’s funded studies and projects. A full time Study Coordinator will be nominated/recruited as well as a Procurement Officer, both acceptable to the Bank, and both funded as part of the GOT contribution to the study. The Study Coordinator, who is the key person in the project organisation and implementation will assure the dialog and consultative activities with the Country authorities, the Steering Committee, the Consultative Committee and with the Consultants performing the studies.

The Study Steering Committee will review and endorse the reports, select the best option, and provide guidance to the Executing Agency. It will comprise senior representatives from the concerned Ministries (MEM, Agriculture, Water and Irrigation, Environment and Finance) and Utilities.

The multipurpose dam, irrigation and hydropower project will have positive and negative impact in a number of sectors, and the selection of the best option as well as the feasibility study should be supported by a transparent consultation process. For this purpose, the EA shall establish a Consultative Committee composed of the main stakeholders, inclusive of Civil Society representatives. The Consultative Committee will inform the decisions of the Steering Committee. Upon specific request from the EA, the Consultants in charge of the studies will attend/participate to the Committees meetings.

The figure below illustrates the entities involved and the arrangements retained for the performance of the pre-feasibility studies.



3.3 Procurement

Detailed procurement arrangements are included in Technical Annex 7.

3.3.1 Assessment of the procurement capacity of the Executing Agency

The responsibility for the management of procurement activities shall rest with the Study Coordination Unit under the duties of the nominated procurement officer.

An assessment of the capacity of the Executing Agency (TANESCO) to implement procurement actions for the study has been carried out by the Bank. The objectives of the assessment were to (a) evaluate the

capability of the implementing agency and the adequacy of procurement and related systems in place; (b) assess the institutional and procedural risks that may negatively affect the ability of the agency to carry out the procurement process; (c) identify risks, develop and incorporate mitigation measures to address the identified deficiencies to minimize the identified risks.

The assessment concluded that TANESCO have sufficient capacity and previous and on-going experience with Bank's funded studies and projects to handle procurement activities envisaged under the proposed Project. However, taking into consideration the nature and complexity of the procurement activities envisaged under the project and in order to enhance procurement capacity, a qualified and experienced Procurement Expert, acceptable to the Bank, shall be nominated/recruited to be part of the Study Coordination Unit and to carry out procurement activities under the project.

3.3.2 Procurement arrangements

Procurement under the Feasibility Study will be limited to the engagement of consultants.

No	Package	Cost (000 €)		Procurement Rule	Selection Mode	Pre-qualification (Y/N)	Bank Prior review	Expected bid opening date
		Total	Bank Fund					
Consulting Services								
1	Feasibility Study (PFS)	1,746.75	1,746.75	Bank's	QCBS	N	Y	April/May/2016
2	Strategic Social and Environmental Assessment (SSEA)	239.45	239.45	Bank's	QCBS	N	Y	April/May/2016
3	Other Studies and Technical Assistance (Climate Change Resilience Assessment, International Notification Process, Financing Plan for Implementation)	263.20		CRIDF	CRIDF	CRIDF	CRIDF	April/May/2016
4	Studies Coordination and Management	213.00		Recipient				

As per discussion which took place during the appraisal and agreement reached between AWF and CRIDF, acquisition of consulting services financed by the Bank (AWF) will be in accordance with Bank's "Rules and Procedures for the Use of Consultants dated May 2008 (revised July 2012), as amended from time to time, using the relevant Bank standard request for proposal (RFP) documents, and the provisions stipulated in the Financing Agreement. CRIDF having with a pool of consultants, will provide the experts themselves otherwise will engage experts required for the Feasibility Study components of which it will finance by following its own procurement rules. CRIDF is willing to finance studies and technical assistance relating to Climate Resilience Assessment, International Notification Process and Financing Plan for Implementation as component 2 of the study. The co-financing arrangement with CRIDF will therefore be on parallel financing

basis. Procurement of goods and services financed by the Government shall be done using Government Procedures.

The recipient has expressed a desire to apply for advanced contracting procedures to facilitate the selection of consulting services related to the pre-feasibility studies, to avoid start up delays in the project.

Annex 8 presents the procurement plan. This document shall be updated and submitted to the Bank every year.

3.4 Disbursement terms and conditions

The direct payment methods shall be used for payment of the main consultancy contracts.

The first disbursement of the AWF grant will be subject to the fulfilment of the prerequisite below:

- Submission of a letter from the Executing Agency attesting that:
 - the Study Coordination Unit is in place;
 - the procurement specialist is duly nominated/designated and approved by the Bank
 - the Study Coordinator is duly nominated/recruited and approved by the Bank.

3.5 Accounting and audit

The detailed report relating to the Financial Management Assessment of the Executing Agency TANESCO is presented in Annex 9.

3.5.1 Evaluation of financial capacity and management

The Bank has conducted an assessment of the adequacy of the financial management system of the Executing Agency based on Bank's FM Implementation Guidelines-2014. The assessment concluded that the overall risk is "**Moderate**". The Proposed mitigation measures as per the risk table, Annex 1, when implemented will enhance the Project ability to (1) use the funds for the intended purposes in an efficient and economical way, (2) prepare accurate, reliable and timely periodic financial reports, and (3) safeguard the entities' assets.

In line with the Paris Declaration on Aid Effectiveness and Accra Agenda for Action, the project will substantially make use of the Country's financial management systems. The overall responsibility of financial management (including Budgeting, Accounting system, Internal Control, Treasury Management/Funds Flow, Financial Reporting and External Audit arrangements) rests with the Study Coordination Unit (SCU) composed of officers from TANESCO and National Irrigation Commission (NIC). The Project Financial Management function will be implemented within the structure of TANESCO with the Chief Finance Officer (CFO) being responsible. A Project accountant with knowledge and experience acceptable to the Bank will be assigned to carry out the finance function of the Project, but will be supervised by the CFO or her delegate.

The Internal Audit Departments will include the project in the internal audit program and audit the project financial transactions regularly. The internal audit reports will be shared with the Bank during supervision missions.

The Executing Agency will produce quarterly progress reports, including all sources of financing and Study expenditures (within 45 days after the end of each quarter). It is also recommended that justification of expenditure should be submitted via Form A2 with the quarterly progress report. As required by African Water Facility (AWF) Operation Procedures, the Project financial statements will be audited by a Private audit firm appointed by AWF in accordance to the audit Terms of Reference approved by the Bank. The audit shall be conducted within 3 months of completing the Study activities. The costs of such audits shall be borne by the AWF and shall not be part of the Grant.

3.5.2 Audit

One Project final audit will be conducted at the end of the studies. The Special Purpose Financial Statements shall be audited by external auditors appointed by the AWF in accordance with an audit Terms of Reference approved by the Bank. The audit reports together with the management letter containing management comments are expected to be submitted to the Bank within six months of Study closure. The costs of such audits shall be borne by the AWF and shall not be part of the Grant. Also, an interim unaudited comprehensive financial statements of the Project shall be submitted to the Bank for review, by the Executing Agency at the end of the first 12 months of the Project.

3.6 Implementation and performance schedule

The chart Annex 1, Calendar for the Studies, illustrates the schedule of the feasibility study implementation. The overall duration of the project/studies is 22 months. The schedule illustrates the chain of completion of components financed by the AWF and CRIDF as well as key dates and events. The breakdown comprises 4 months for preliminary activities by the EA (Namely procurement activities for recruiting the Consultants), 15 months for the execution of the pre-feasibility studies including onsite investigations, and 2 months for the EA to finalize audits, evaluation and closing of the project.

The period of 5 months for conducting the SSEA studies is included within the 15 months' period of pre-feasibility studies. The overlap aims at facilitating communication and coordination between the 2 consultants for duly taking socio-environmental main identified constraints into consideration in the preliminary design of the project infrastructures.

Other studies (Climate Change Resilience Assessment, International Notification Process and Financing Plan for Implementation for an estimated duration of 6 months) by other consultants/experts under the funding of CRIDF can be planned and performed at appropriate times matching the progress of the pre-feasibility and SSEA studies for a better incorporation of their findings and results in the preliminary design of the project infrastructures.

The table below presents the performance schedule, with the main milestones of the project from the date M0 being the date of AWF grant/funding approval.

MAIN ACTIVITIES/KEY EVENT	INDICATIVE END TIME OF ACHIEVEMENT
Pre -FS and SSEA ToR for EA review	M0 - 3
Request for Advance Acquisition Actions (AAA) and launch of the procurement process	M0 - 2
Project/funding Approval	M0
Signature of the grant agreement	M0 + 3
Fulfilling of the condition before disbursement	M0 + 4
Award of Consultant contract for Feasibility Studies	M0 + 5
Award of Consultant contract for SSEA Studies	M0 + 12
Comprehensive unaudited interim Project financial statements	M0 + 12
Completion of SSEA Studies	M0 + 17
Completion of Feasibility Studies	M0 + 20
Elaboration of the project completion report by the Executing Agency	M0 + 22
Final Audit and AWF project completion report	M0 + 22

3.7 Monitoring, reporting and communication arrangements

The project follow-up/assessment plan will be put into place by the Executing Agency/SCU (Study Coordination Unit within TANESCO), subject to the Bank's approval, based on the Logical Framework Matrix that identifies how the project will be rolled out, the objectives to be met and anticipated outcomes. The Steering Committee and the Consultative Committee are the priority receivers of the follow-up reports, which will be shared with AWF and ministries and agencies, stakeholders to the project.

The Executing Agency will issue quarterly progress reports, a copy of which will be transferred to the AWF. The reports will be accompanied with administrative and technical follow-up documents, financial statements for each account in compliance with the AWF's format requirements and procedures (Bank's usual format) respectively.

Continued assessment of performance will be made using indicators defined in the Project Logical Framework. An end-of-project report presenting all activities completed and outcomes achieved and the closing financial situation will be drawn up by the recipient and sent to AWF.

For monitoring and follow-up purposes, the AfDB/AWF will jointly appoint a Project Manager who will supervise the project and carry out follow-up procedures. The Bank, as the host institution for AWF, may, at any moment and in consultation with the Executing Agency, carry out field supervision missions.

Moreover, the Executing Agency will comply with the AWF's guidelines specified in Annex 5: **AWF's communication and visibility guidelines** regarding how AWF's role in the project is to be emphasized.

4. Project benefits

4.1 Effectiveness and efficiency

The project effectiveness and efficiency will be guaranteed by: (i) the step-wise approach which will help the Tanzanian Government and sectorial concerned line ministries select the best option before embarking on the fully-fledged feasibility studies and detailed design of the project infrastructures, (ii) the consultation process incorporated in the studies activities and, (iii) the financing plan/strategy that will support financiers' mobilization for the next stage of the studies and the further capital investments for the implementation.

4.2 Sustainability and cross cutting issues

Sustainability: The sustainable availability of water resources for agriculture and irrigation purposes and as a renewable source of energy for the long term is a major development concern for this region of Tanzania as well as for the Government with responsibility for transboundary water resources inflow management to Lake Nyasa. The construction of a hydropower scheme of significant capacity (but as a non-consumptive use of water) coupled with the regulation effect of the Ruhuhu River regime will positively influence the environmental and ecological systems through protection against extreme variations in flow. It will meet basic human needs in the area accompanied with the appropriate mitigation measures for not endangering or degrading the natural environment.

Environmental and Climate Change aspects: The Project preliminary design will place specific emphasis on environmental and social safeguarding by means of the Strategic Social and Environmental Assessment. The project objective, when the infrastructure is implemented on site, is to achieve improvement of populations' living standards and economic growth through an inclusive approach and provision of utility services (water supply and access to electricity). Climate Change is duly taken into account in the design and dimensioning of the infrastructures. It is specifically supported by the Technical Assistance and Advisory services funded by the CRIDF. The project is also an effective Climate Change Adaptation measure as it contributes to reduce the negative effects of Climate Change, particular extreme events of floods or droughts in the concerned area as well as better regulation of the Ruhuhu River inflow into the Lake Nyasa reducing the amplitude of level seasonal fluctuations.

Green growth, gender, and inclusivity: A multipurpose dam in the lower part of the Ruhuhu River will, contribute to green growth through achieving sustainable development outcomes. It represents an investment in resources savings by optimizing the use of water resources, by increasing exploitation of renewable hydroelectricity and potential irrigated land. It incorporates actions for the protection of the concerned catchment area as a natural capital. Financial resources, which will be mobilized for its development and construction, will satisfy development needs and at the same time will reduce the vulnerability of the socioeconomic systems of the concerned area to climate change and resource constraints. The targeted impacts oriented towards the increased water and electricity availability (drinking water and irrigation) for middle class populations is a significant factor of inclusivity and by allowing more free time will offer opportunities for productive and rewarding activities for women. Additionally, the studies will determine the most suitable techniques, construction methods and more efficient use of energy, materials and manpower at the time of the project final design for construction.

The terms of reference for the technical consultant's services require that the latter ensure that the design of the project assimilates green growth, inclusivity and gender features. The use of environmentally friendly technologies and construction methods with low carbon emissions and intensive use of manpower is a requirement stipulated in the terms of reference to ensure the project's sustainability.

Economic and financial aspects: The economic viability of the Project and its contribution to economic development including revenue generation and creation of local employment opportunities are fundamental factors that have received special attention. The project will generate revenues from water supply, electricity generation and several multipurpose benefits induced by possible other economic activities like fish farming, tourism, commodity processing, trading and transport.

5. Legal instrument and authority

5.1 Legal Instrument

The project will be financed pursuant to the signing of a Protocol of Agreement between The United Republic of Tanzania (TANESCO) and the African Development Bank (the "Bank") as Trustee for the African Water Facility Special Fund.

5.2 Conditions associated with the Bank's Intervention

Entry into force of the Protocol of Agreement: The Protocol of Agreement will enter into force on the date of its signature by the Republic of Tanzania and the African Development Bank.

Conditions precedent to first disbursement of the grant: The obligation of the Bank to make the first disbursement of the grant shall be conditional upon the entry into force of the Protocol of Agreement and the fulfillment by the Grantee, in form and substance satisfactory to the Bank of the following condition: Provide evidence of designation or recruitment of (i) a qualified Study Coordinator and (ii) a procurement Specialist whose qualifications and experience are acceptable to the Bank.

Other conditions: The Recipient shall, in form and substance satisfactory to the Bank, fulfil the following conditions: (i) provide evidence within two (2) months of entry into force of the Protocol Agreement the establishment of fully furnished office with adequate space for SCU, consultant and counterpart staff, (ii) provide within two (2) months after the first disbursement, evidence of the recruitment/assignment of an Administrative Officer, an Accountant, a Monitoring and Evaluation Specialist, and a Communication Officer and other secretarial and logistical support staff as part of the Study Coordination Unit; (iv) provide, within four (4) months after the first disbursement, evidence of the assignment of counterpart staff; and (vi) provide, within five (5) months after the first disbursement, evidence of the establishment of a Steering Committee and of a Consultative Committee.

5.3 Compliance with Bank's Policies

This project complies with all applicable Bank policies and AWF strategy and operational procedures.

6. Conclusions and recommendations

With the ultimate aim to reduce poverty and increase economic growth, the project, when the infrastructure is commissioned, will improve availability of water resources for irrigation and associated activities in the area and electricity generation and supply to the national grid. It will, through the irrigation and water supply components, directly benefit about 15,000 inhabitants in the immediate vicinity of the project area. The electricity generation will benefit Tanzania as a whole. Therefore, the project is of utmost importance for the region and fits into the country national water resources and electricity sector development objectives and strategy. It is coherent with the Africa Water Vision. It is also aligned with the priorities of the AWF Strategic Plan 2012-2016 and the Bank's Long-Term Strategy 2013-2022, comprising infrastructure development as one of its operational priorities coupled with contributing to agriculture and food security as areas of special emphasis. The Multipurpose Dam project, which is the ultimate outcome of the proposed studies, is fully coherent with the "High-Fives," and supports 4 of the "High-Fives" directly – energy, food security, industrialisation and livelihood improvement. Integration is also supported as the downstream project affects transboundary water and falls under the ZAMCOM agreement. The funding of the pre-feasibility studies and the full feasibility studies when the latter are also funded will generate a leverage effect of approximately 1/130.

Furthermore, the project presents a holistic approach; the studies and services consider all the subjects necessary to ensure quality at entry and optimum structuration (institutional and legal, technical, environmental, financial, organizational, and operational and management aspects).

Based on the analysis of the project's pertinence, effectiveness and sustainability, it is recommended that a grant not exceeding € **1,986,198** from AWF resources be extended to The United Republic of Tanzania.

Annex 1: Calendar for the Studies

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	
Component 1: Pre-Feasibility Study																	
Phase 1	Data and Information Collection																
	Inception Report																
	Remarks and comments from EA																
Phase 2	Site reconnaissance and Investigations																
	Draft Report on findings and data																
	Remarks and comments from EA																
	Final Report on findings and data																
Phase 3	Techno-economic studies																
	Draft Pre-feasibility Report																
	Remarks and comments from EA																
	Final Pre-feasibility Report																
Phase 4	Drafting of Feasibility Studies ToR																
	Draft Version of ToR																
	Remarks and comments from EA																
	Final Version of ToR																
Phase 5	Funders' mobilisation																
	Funders' Roundtable																
	Minutes and proceedings of Funders' Roundtable																
Component 2: Other studies and technical Assistance (CRIDE)																	
2.1	Climate resilience assessment																
2.2	Financing plan for implementation																
2.3	International Notification Process																
Component 3: Strategic Social & Environmental Assessment (SSEA)																	
Phase 1	Public Consultation Strategy. (6 Weeks - 1.5 Months)																
	3.1.1 Presentation of Preliminary Work Plan																
	3.1.2 Presentation of Scoping and Consultation Report																
Phase 2	Strategic Social and Environmental Assessment. (12 Weeks - 3 Months)																
	3.2.1 Publication of Draft SSEA Report to EA and Stakeholders																
	3.2.2 Public meetings and hearings																
	3.2.3 Corrections and Amendments of Report																
3.2.4 Edition of Final SSEA Report																	
Phase 3	Drafting of Terms of Reference of the ESIA studies (4 weeks - 1 Month)																
	3.3.1 Review by the EA																
	3.3.2 Finalisation of ESIA ToR																
Component 4: Study Coordination and Management																	

Annex 2: Detailed costs of the project/studies

		Total	Experts	Inter. Trav.	Allowances	Onsite Investig.	Local Transp.	Roundtable	Contingencies
Summary Component 1: Pres-feasibility Study									
Phase 1	Data and Information Collection	232,613	182,500	9,100	26,663		3,274		11,077
Phase 2	Site reconnaissance and Investigations	713,826	316,750	11,700	36,338	305,000	10,047		33,992
Phase 3	Techno-economic studies	607,344	511,750	15,600	42,525		8,548		28,921
Phase 4	Drafting of Feasibility Studies ToR	88,564	70,250	5,200	7,650		1,247		4,217
Phase 5	Funders' mobilisation	104,404	55,500	7,800	8,663		1,469	26,000.00	4,972
		1,746,751	1,136,750	49,400	121,838	305,000	24,585	26,000	83,179

		Total	Experts	Inter. Trav.	Allowances	Onsite Investig.	Local Transp.	Roundtable	Contingencies
Component 2: Other studies and technical Assistance (CRIDF)									
3.1	Climate resilience assessment	84,167.6	60,500.00	5,200.00	13,275		1,184.63		4,008
3.2	Financing plan for implementation	139,187.0	115,000.00	3,900.00	11,700		1,959.00		6,628
3.3	International Notification Process	39,845.7	26,000.00	5,200.00	6,188		560.81		1,897
		263,200	201,500	14,300	31,163	-	3,704	-	12,533

		Total	Experts	Inter. Trav.	Allowances	Onsite Investig.	Local Transp.	Roundtable	Contingencies
Summary Component 3: SSEA Study									
Phase 1	Public Consultation Strategy.	85,100	66,000	2,600	11,250		1,198		4,052
Phase 2	Strategic Social and Environmental Assessment.	127,011	98,000	5,200	15,975		1,788		6,048
Phase 3	Terms of Reference of the ESIA studies	27,336	20,750	1,300	3,600		385		1,302
		239,447	184,750	9,100	30,825	-	3,370	-	11,402

Component 4: Study Coordination and Management		
	In kind contribution from recipients equivalent to:	213,000

Summary of study costs	Total	Experts	Inter. Trav.	Allowances	Onsite Investig.	Local Transp.	Roundtable	Contingencies
Component 1: Pre-feasibility Study	1,746,751	1,136,750	49,400	121,838	305,000	24,585	26,000	83,179
Component 2: Other studies and Technical Assistance	263,200	201,500	14,300	31,163	-	3,704	-	12,533
Component 3: Strategic Social & Environmental Assessment (SSEA)	239,447	184,750	9,100	30,825	-	3,370	-	11,402
Component 4: Study Coordination and Management	213,000.00							
Total	2,462,399	1,523,000	72,800	183,825	305,000	31,659	26,000	107,114

Annex 3: Terms of reference for the Feasibility Studies

United Republic of Tanzania

Feasibility Study for The Kikonge Multipurpose Dam, Hydropower and Irrigation Project

Terms of Reference

November 2015

African Water Facility | Facilité africaine de l'eau
African Development Bank | Banque africaine de développement
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Annex 1: Map of Tanzania and Project area

Annex 2: Indicative calendar of the pre-feasibility studies

Acronyms and Abbreviations

ADB, AfDB	<i>African Development Bank</i>
AWF	<i>African Water Facility</i>
BOQ	<i>Bill of Quantities</i>
CAD	<i>Computer Assisted Design</i>
CBA	<i>Cost Benefit Analysis</i>
CRIDF	<i>Climate Resilience Infrastructure Fund</i>
CSS	<i>Climate Safeguards System</i>
DANIDA	<i>Danish International Development Agency</i>
EA	<i>Executing Agency</i>
EIRR	<i>Economic internal rate of return</i>
EPP	<i>Emergency Power Plant</i>
EPP	<i>Emergency Preparedness Plan</i>
ESIA	<i>Environmental and Social Impact Assessment</i>
FAO	<i>Food and Agriculture Organisation</i>
FIRR	<i>Financial Internal Rate of Return</i>
GBR	<i>Geotechnical Baseline Report</i>
GHG	<i>Green House Gas</i>
GIS	<i>Geographic Information System</i>
GOT	<i>Government of Tanzania</i>
ICOLD	<i>International Commission on Large Dams</i>
LIDAR	<i>Light Detection And Ranging</i>
MEM	<i>Ministry of Energy and Minerals (Tanzania)</i>
MoWI	<i>Ministry of Water and Irrigation</i>
NIC	<i>National Irrigation Commission</i>
NPV	<i>Net present value</i>
O&M	<i>Operation and Maintenance</i>
FS	<i>Feasibility Study</i>
PIM	<i>Project Information Memorandum</i>
POE	<i>Panel of Experts</i>
PPP	<i>Public Private Partnership</i>
SADC	<i>Southern African Development Community</i>
SC	<i>Steering Committee</i>
SCU	<i>Study Coordination unit</i>
SSEA	<i>Strategic Social and Environmental Assessment</i>
TANESCO	<i>Tanzania Electric Supply Company</i>
TL	<i>Team Leader</i>
ToR	<i>Terms of Reference</i>
TRIPDA	<i>Tripartite Regional Infrastructure Data Base</i>

1. Introduction

The African Water Facility (AWF) received requests for funding to support project preparation through Feasibility Studies and Environmental and Social Impact Assessment Studies introduced in November 2014 by Tanzania Electric Supply Company (TANESCO) and the National Irrigation Commission (NIC) on behalf of the Government of Tanzania (GOT) for development of an irrigation project and the development of a hydropower scheme on the Ruhuhu River in the south-west of the country.

The Ruhuhu irrigation project first appeared at the SADC Water Sector Infrastructure Investment Conference which was held in Maseru in September 2011. It also appeared in the SADC Infrastructure Investment Conference that was held in Maputo in July 2013. It is included in the SADC Regional Infrastructure Development Master Plan of August 2012. The project is listed in the COMESA-EAC-SADC Tripartite Regional Infrastructure Project Data base (TRIPDA) dated 20 June 2013 established during the Regional Infrastructure Conference under the item # 838: “Ruhuhu Valley Irrigation Scheme (Project P1-12)”. The Ruhuhu Irrigation project is included on the National Irrigation Master Plan.

The site for the dam (for hydropower generation and water storage) was initially identified in the 1980's through a scoping study funded by DANIDA, the Danish International Development Agency on behalf of the Ministry of Water. Subsequently in 2013, a team of experts of CRIDF conducted a reconnaissance mission in Tanzania and on the site which led to confirm the basic features of the scheme and its appropriateness for the development of a multipurpose dam project including the development of an irrigated area of 4,000 ha. The Kikonge Hydropower project is now being entered into the Power Supply Master Plan presently under revision.

2. Project Description

The project infrastructures comprise i) an irrigation scheme, covering 4,000 ha including a derivation weir, the main canal, the downstream command areas, a mini hydropower plant and water supply systems to the local communities and ii) a hydropower scheme including a 120 m high dam, a storage reservoir of 6 Bm³ capacity 60 km long and a 300 MW power plant and the various appurtenant infrastructures. The Annex 1 provides a map of Tanzania showing the project location area.

3. Scope of the Feasibility study

The pre-feasibility studies will cover the whole project as a multipurpose dam, irrigation and hydropower project. In addition to the main infrastructure works which are the irrigation scheme, the dam and its reservoir and the associated hydropower plant and the high voltage transmission line the study will also encompass the other uses in relation with the mobilisation of water resources like: water supply to local communities, local electricity supply through a mini hydro-power plant, the fishing activities, the tourism development and the other uses of water for activities in the reservoir area (water for mining processes).

The pre-feasibility studies will be rolled out in several phases broadly described hereafter and detailed further in the present terms of reference:

3.1 Phase 1: Data and information collection

These activities are common for the irrigation and the hydropower aspects. They cover the collection of data and information and the consultation of previous studies reports and all available documents.

3.2 Phase 2: Site reconnaissance and investigations

This phase will proceed with a visit of the proposed identified sites for the infrastructure works and a general appraisal of the local environment and socio-economic features of the area.

The technical investigations will comprise the appraisal of the topographical, geologic and geotechnical aspects of the project sites. The topographic investigations will allow to establish maps with the adequate scale and accuracy for assessing the extent of the irrigation area, the profile of the river bed at the proposed locations of the dam and weir and the extent and capacity of the reservoir for various impoundment levels.

The hydrological study of the catchment area of the Ruhuhu River will be performed for determining the water available resource, the river regime and flooding patterns.

Phase 2 will include a multi-criteria comparison of options aimed at defining the main characteristics of the infrastructures before developing the outline design.

3.3 Phase 3: Techno-economic studies

This phase will comprise the technical and economic studies for assessing the feasibility of the project as a multipurpose scheme comprising the irrigation component, the hydropower component and the other peripheral sub-projects for other water usages. An outline design will be developed, on the basis of previous orientations proposed during the previous studies (CRIDF study reports). Sketches and drawings illustrating the locations of the works, their basic dimensional and capacity features will be established allowing for estimating the quantities of works and their costs. During this phase, computations for a cost/benefit ratio analysis will be performed.

3.4 Phase 4: Drafting of Terms of Reference (ToR) for further studies

Under this phase, the Consultant will establish the ToR for the further studies needed to bring the components of the project to the level of definition and accuracy required for their implementation. The ToR are: i) Full Feasibility Study and Final Design of the project including the preparation of the Tender Dossier for implementation ii) A consultative and participative process for the definition and selection of the most appropriate institutional and operational arrangements for the implementation of the agro-irrigation component and iii) An Agro-development strategy. The cost and funding needs for these studies, as separate packages will also be established by the Consultant.

3.5 Phase 5: Promotion of the project and mobilization of funds for the further studies

The activities under this phase will be developed all along the duration of the feasibility study in order to present and promote the project to other donors and other stakeholders in view to mobilise funds for the performance of the next stage of above mentioned studies and detailed ESIA studies (Detailed ToR and cost established by the other Consultant in charge of the Strategic Social and Environmental Assessment studies) as well as to assess the interest of financiers and private sector operators for financing the investments.

4. General scope of the studies

4.1 Introduction

The broad scope of work is to conduct a feasibility study and technical desktop studies to make an assessment of the sites identified for the project components or other sites if other locations offer better alternatives specifically for the dam and the associated reservoir and hydropower plant. One specific objective of the studies is to bring the hydropower project to a level of confidence enabling the client to engage into the further steps of detailed feasibility and final design in view of its implementation. For the irrigation component, the objective is similar but irrigated areas can be implemented by phases, depending on the development model retained for their operations and maintenance that will result from the further studies and specifically the consultative and participative process and the Agro development strategy. The study will focus on the main risk elements, which for both components, are geological and geotechnical conditions, hydrology, environmental and social impacts and more specifically for the hydropower component, the placement of the

generated power in the national electric system. Foundation aspect being of critical importance for dam/weirs and hydropower projects, on the geotechnical side, the study will comprise on site investigations with adequate methods and means for determining the actual soils and rock conditions at critical locations. The detailed description of specific tasks to be completed by the Consultant is provided in the following chapters of the present Terms of Reference (ToR). The study will specifically include:

- Review of previous work carried out in the local area (desk based research, consultations with community group members, local authority planning database etc.);
- Review of hydro-power options for the proposed location and outline scheme layouts:
 - Catchment and hydrology, estimate of water resource available (and generation of flow duration curve) and head measurements (including use of any appropriate software as required and with information on testing and validation of the software used);
 - Site visit(s) (walk-overs) to evaluate potential hydropower locations or/and to confirm the appropriateness of the site identified during the previous reconnaissance study;
 - Review of construction access to the site;
 - Outline scheme layouts (equipment requirements), construction requirements for the hydro site (intake, spillway, powerhouse, penstock route, switchyard and evacuation line, etc.);
 - Identification of suitable grid infrastructure in the local vicinity;
 - Evaluation of estimated annual energy generation and CO₂ emissions offset;
- A preliminary financial analysis with cost estimations and revenue (capital cost estimates and operation & maintenance) clearly noting method of estimation, details of relevant assumptions and uncertainty of estimates;
- An initial understanding of the following, with future recommendations should be provided:
 - Environmental impacts on the local area;
 - Risks of developing a hydropower scheme at the site, and how these risks are best mitigated.
- An evaluation of the hydropower sites reviewed, and preferred option presented to recipient. This option appraisal should (at the minimum):
 - Consider technical and physical constraints of hydro development for the different hydropower options;
 - Estimate of scheme characteristics and key assumptions (head, design flow rate, design power output, annual energy yield);
 - Potential permitting and environmental constraints;
 - Account for most recent take-off tariff rates that may influence the sizing of the scheme and sizing to optimise benefit from the tariff;
 - Budget cost estimations (capital costs and operation and maintenance) and revenue.
- Communications and project promotion activities aiming at:
 - Informing stakeholders and community of donors on the progress of the study;
 - Mobilising additional funds through a Donors' Roundtable for the next phase of detailed feasibility study, including detailed design, tender dossier and structuring of the investment financing and additional studies for the consultative and participative process and the Agro-development strategy.

4.2 Methodology

Consultants should propose how they intend to approach the delivery of the requirements set out above. Where possible the study activities will be phased to include break points, such that any barriers identified in the development of the project that would completely prohibit further development, should be outlined (for example, if water resource analysis reveals limited annual flow). The EA Study Coordination Unit (SCU) will determine, in consultation with the appointed consultant and on the basis of comments and decisions taken by the Committees (Steering Committee and Consultative Committee), whether the project should proceed further.

It is expected that the following activities will be included:

- An introductory/inception meeting with the EA Study Coordination Unit to assess needs, preferences and aspirations, as well as to agree ways of working, timeframe, logistics, etc.;
- Confirm the scope of works following the introductory meeting with any amendments/adjustments to the proposal highlighted and issued. It is however anticipated there will be minimal changes;
- Site visits to conduct walk-over surveys and data collection;
- Regular progress reports and close liaison and collaboration with the EA;
- Presentation to the EA of the findings and draft reports before completion of each phase of the study, with opportunities for discussion and questions. The outcome of these presentations and discussions will be used to finalise the reports. The Annex 2 illustrates the tentative calendar of the feasibility study.

The Consultant is aware that other studies performed by other consultants will be conducted in parallel. They are:

- Other studies and Technical Assistance, funded and performed by CRIDF relating to i) Climate Resilience Assessment, ii) International notification process (in relation with internationally shared water resources issues) and iii) Financing plan/(strategy) for implementation.
- Strategic Social and Environmental Assessment studies (SSEA) and preparation of the Terms of Reference for the further comprehensive ESIA studies.

All studies are inter-related and therefore require exchange of information and coordination amongst the consultants in charge.

5. Detailed scope of the studies

5.1 Phase 1: Data and information collection

5.1.1 Task 1.1: General context of the project

Sufficient relevant basic information for the project shall be collected and new data prepared to deepen the information whenever necessary and possible.

The consultant should collect relevant studies, data and information, identify and review the Ruhuhu River Basin development planning reports as well as review reports from previous regional studies (like the irrigation potential assessment of the region), sector and country/regional strategies, as well as national and regional policies related to water resources and agricultural development within the basin.

The Consultant should screen and synthesize the data and establish his project databank related to policies, institutions, existing infrastructure, hydrology and meteorology, topography and maps, geology, soils and materials, multipurpose aspects, agriculture, hydropower, possible environmental impacts (both positive and negative), and socio-economic conditions for use in further analysis. The Consultant should at this stage enquire on the basin hydro-meteorological station network for a better understanding of the water flux in the catchment. This information must be evaluated to determine its validity for use throughout the development of the project. The Consultant will acquire at their expense all maps, satellite photos, numerical and digital data bases required for the studies.

Under this task, the Consultant will also collect through desktop studies the information and data on the Agriculture/Irrigation and the Electricity sectors, general geographical data as well as the overall socio-economic data and indicators relating to the region of the project.

5.1.2 Task 1.2: Preliminary assessment of project data and information

Under this task, the Consultant will establish dialog with and organize working meetings with the Executing Agency Study Coordination Unit and concerned line ministries in order to collect additional information and to assess the validity of those already collected. This will be the opportunity to also confirm the status of the project within current government strategies and policies and to agree on the expected outputs and outcomes

of the project components at various time horizons. The findings and results of this task will be under the form of an Inception Report which will fix the further orientation of the studies and confirm the main options/choices to be retained on some specific/critical aspects of the Ruhuhu project. The report will incorporate remarks and decisions confirmed by the Executing Agency further to consultation with the Steering and Consultative committees.

5.1.3 Task 1.3: Institutional framework assessment

The objective of this Task is to identify possible institutional arrangements for the proposed project to be sustainably implemented, operated and managed in the future. The consultant will assess institutional constraints and opportunities for efficient management of irrigated agricultural production in the project area and adequate operation and maintenance of the project infrastructures. The institutional analysis will define the linkages with the current institutional framework of Tanzania in the domains of water resources management, agriculture and irrigation, electricity generation and will recommend implementation arrangements. This will cover:

- (i) Assessment of the institutional (including environmental and social) capacity of local agencies supporting agriculture and delivering irrigation services and agencies in charge of the electricity industry sector;
- (ii) Assessment at the field level of the importance of and access to local groups and institutions for different socio-economic groups for both women and men;
- (iii) Assessment of private sector involvement in the agriculture sector (particularly in rural finance, input supply, machine leasing, output storage, agro-processing, and marketing, including the role of cooperatives and farmers' associations) and in the electricity industry sector including in the light of reforms in progress;
- (iv) Likely implementation and operation arrangements for the potential project(s) including potential for Public-Private-Partnerships (PPP); and
- (v) Explore opportunities for various social groups (women and men), to participate in decision making processes.

The more detailed institutional and operational arrangements will however be established and confirmed at a further stage (not covered by the Pre-feasibility studies) when the consultative and participative process and the Agro development strategy are completed.

5.1.4 Phase 2: Site Reconnaissance and Investigations

Under this Phase, the Consultant will proceed with the physical reconnaissance of the project area and the sites potentially identified for the construction of the infrastructure works. The domains of topography, hydrology, geology, geotechnics, soils identifications and in general all natural, geographical, environmental and socio-economic features will be investigated. The Consultant will apply to the maximum possible extend a participative and consultative approach involving all potential stakeholders in order that they have the opportunity to express their views and opinions at the very beginning of and during the study process.

5.1.5 Task 2.1: Topography

The objective of this task is to establish maps and documents illustrating:

- (i) The configuration of the dam site and reservoir area;
- (ii) The configuration and layout of the command areas and associated works like the weir, the main canal, the buffer storage dam, the irrigated parcels and service roads and access;
- (iii) Accessibility to dam site;
- (iv) Accessibility to construction material sources and borrow areas, as a means towards preselection of dam type and appurtenant structures;
- (v) Influence on type, layout, and downstream inundation in the selection of the spillway; and

(vi) The preliminary identification of sensitive areas that the SSEA study (and further ESIA studies) will have to consider.

Irrigation and hydropower projects (with storage reservoirs) are highly sensible to the topographical patterns of the area. The Consultant will therefore identify the most appropriate means for obtaining maps or establishing them at appropriate scales in order to obtain information of sufficient accuracy for the purpose of a feasibility study. As it appears that available maps are not recent enough and at the maximum of 1/50,000 scale, the Consultant should propose a method for establishing contour maps of better definition. The Consultant may carry out topographical surveys as a combination of various methods (on site surveys, numerical data bases, satellite imagery, etc.) to capture specific site features such as the proposed dam axis, spillway area, energy dissipation area, reservoir extent, surface area-volume-depth curves, river channel profiles, locations of proposed infrastructure for irrigation, hydropower, water supply, livestock, fish farming, watershed intervention areas, etc.

The project infrastructures comprising the irrigated surfaces, the water conveyance and canals systems, the dam and the reservoir are estimated to concern an area of 35,000 ha. The Consultant is invited to propose a LIDAR survey, including data processing for the needs of the pre-feasibility studies. The cost of the survey shall be clearly identified in his proposal. The data and files deriving from the survey will be the property of the Client and available for further processing for the next phases of the project development. As an alternative, the Consultant will propose simplified methods, with the corresponding cost estimate like exploitation of aerial and satellite imagery and interpretation like SRMT products (Shuttle Radar Topography Mission) or similar.

The accuracy of topography and maps should be sufficient for establishing i) the hydraulic patterns of the irrigation component, including drainage network, ii) the volume/elevation/surface curves of the reservoir, iii) the flood routing characteristics downstream of the dam in case of failure or extraordinary event.

The survey will also capture site features such as existing infrastructure within the proposed project area (roads, buildings, bridges, power lines, etc.), trees and vegetation, rock outcrops, etc. Prospective borrow areas for dam and construction materials and aggregates shall be mapped at an adequate scale for further identification on site. The method utilized shall permit to establish cross-sections of the river and its flood plain with the project area at intervals at locations deemed relevant for incorporation in the mathematical hydraulic model of the river (to be specified in the technical proposals) for purpose of routing floods in the event of extreme spillway releases. Topographic survey on the reservoir area extent shall be done to an appropriate scale with contour intervals of 1m up to an elevation of maximum water level + 6m.

The final output will be detailed and clear site maps (of a scale equal or better than 1:1,000 with 0.5m contour intervals (at location of the selected dam site) and scales of 1:500 to 1:200 as applicable with contour intervals of 0.25 m (at locations of ancillary structures expected to cover about 0.5 km²). The dam cross section of both vertical and horizontal shall be prepared at a scale of 1:100 indicating the pertinent features of the head works.

For further reference on the site, all the required benchmarks and stations shall be established using stable features and be properly connected with the national grid stations and benchmarks of the proposed dam site and near the intake structures of the irrigation system. The number of benchmarks will be proposed in the technical proposals.

5.1.6 Task 2.2: Hydrological Analysis

The aim of this task is to determine the hydrological patterns of the catchment area and the Ruhuhu River and the resulting characteristics of the river discharge at the location of the dam in order to dimension the critical components of the scheme and in particular the capacity of the spillways and arrangements for the protection of the site and works during the construction. The analysis will also establish the runoff in order to assess the capacity and size of the other components of the project like the power plant and the irrigated/command areas

(cf. 2.3). The consultant must propose appropriate methods for the hydrological analysis, considering the needs of the project and the likely limited access to local information of high quality.

The task of the Consultant shall be to:

- (i) Assess the data quality of available runoff and rainfall data. This shall include assessing fieldwork procedures and frequency of measurements, data processing systems and rating curves. The Consultant may use a multi-basin statistical comparative approach to determine gauging and rainfall stations which show data inconsistencies.
- (ii) The Consultant must, during the course of the feasibility study, carry out flow measurements in the Ruhuru River at the proposed Dam location and at the off take structure for the irrigation canal. This shall be done in collaboration with the Lake Nyaza Basin Office. There must be a least 3 separate measurement campaigns at low, high and medium flow levels.
- (iii) Quantify the monthly runoff in different sites of the basin;
- (iv) Adopt appropriate hydrological techniques to derive the required design flows (including extreme flood flows) and other hydrological information/statistics from the nearest available gauging stations, rainfall records, etc. where sufficient hydro-meteorological data are not available;
- (v) Assess the spatial and seasonal fluctuations of climatic variables on the hydrological characteristics for the project;
- (vi) Undertake hydrological analyses to estimate reservoir yield, inflow design flood to facilitate the pre-feasibility level design and sizing of different hydraulic structures such as the reservoir, spillway and outlet works;
- (vii) Determine the flow duration curves to facilitate the preliminary design of the hydropower components such as turbines, canals, penstock, etc.

The Climate Change aspect will be duly considered by the Consultant in their studies through adequate coordination and exchange of information with the consultants and experts working on this subject under the funding of CRIDF.

5.1.7 Task 2.3: Assessment of water allocation.

The task objective is to assess the water requirements for the various uses and optimise the water allocation based on economic and environmental criteria. The Consultant must propose appropriate methodologies considering the needs of the project.

The Consultant shall:

- (i) Determine the current and potential future water uses, including the environmental water flows, and demands for the identified water uses at the project area, together with their seasonality, levels of service, priority of use and cumulative effects; Effects on the Lake Nyasa hydrological regime shall be considered when determining the environmental flows;
- (ii) Assess and quantify any current and planned upstream water uses (abstractions/diversions/discharge of wastewater) and their impacts to the proposed project;
- (iii) For the water supply aspect to local communities, assess both the surface and groundwater potential and availability and examine potential for conjunctive use of available surface and ground water resources in an environmentally sustainable manner;
- (iv) Develop a water balance model, coupled with a broad economic model based on ratios such as mean gross margin per ha for the irrigation or mean alternative marginal production cost of kWh produced for hydropower;
- (v) Based on this model, assess at least three scenarios combining different assumptions of irrigation scheme size or cropping patterns type, environmental flows satisfaction, prioritization of uses (hydropower first or irrigation first), etc. from a water balance, economic and environmental perspectives.
- (vi) Propose optimised water allocation scheme between the various uses and derived characteristics of the dam and irrigation scheme.

5.1.8 Task 2.4: Sediment and morpho dynamic Analysis

It has been observed on site close to the city of Lituhi near the mouth of the Ruhuhu River into Lake Nyasa that the water remains heavily loaded with sediments, including during the dry season. This denotes that ongoing activities (mining, logging, agriculture?) upstream of the identified project site within the catchment area are provoking significant soil erosion. In view of the existing concerns of land degradation, erosion and sedimentation within the project area, the Consultant will assess the sediment regime and total sediment transport of the river system in the project area. This will include:

- (i) Determination of the sediment yield (estimates of sediment load should include projections of changes in upstream sediment release, based on upstream development plans, additional sediment data should be collected during the course of the studies, from the existing hydrological stations);
- (ii) Forecasting of dead storage volume and the future rate of reduction of the live storage and reservoir trap efficiency, which will require limited sediment sampling to the extent possible.

Other than design against the storage depletion (reducing yield and flood attenuation capability), this analysis should also aid the subsequent design against increased loads on the dam, abrasion of outlet structures (e.g. spillways) and mechanical equipment and blockage of outlets which could cause interruption of benefits (e.g. irrigation releases) and reducing the ability of the dam to pass floods safely (e.g. by blocking emergency outlet gates). The analysis will also lead for substantiating the future operation manual of the dam in relation with planned releases and flush release for evacuating accumulated sediment. Sediment load estimates should include projections of changes in upstream sediment release, based on upstream development plans. The Consultant will take into consideration the action plans which are foreseen in the near future for the protection of the watershed under the guidelines prepared by the line ministry in charge in Tanzania. They will draw conclusions and recommendations concerning the impact on the life span of the scheme and on the constructive measures to be retained for the project design and its operation and maintenance.

Based on the findings of their assessment, the Consultant will define the works recommended for desilting and de-sanding measures at the water intake to the irrigation canal.

In addition, and in order to establish the most appropriate design of the project and take account of its impact on the downstream part of the river, the Consultant will consider a morpho-dynamic approach/modelling for predicting the possible evolution of the river bed as a result of the water storage and retention of sediments when the hydropower scheme is implemented and operated. This analysis should be aimed at determining the probable evolution of the longitudinal profile of the river and indirect environmental effect. In particular effects of a deepening of the riverbed on the aquifer, wetlands, delta dynamic and spawning areas will be assessed and mapped.

The Consultant shall determine mitigation measures aimed at limiting the morphological impact of the dam and irrigation scheme and managing the bed load sediment all along the river.

The Consultant will detail in their technical proposal the methodology proposed for this morpho dynamic analysis. It should allow for the quantification and mapping of the probable evolution of the river bed.

5.1.9 Task 2.5: Water Quality and Quantity Assessment

The Consultant will provide an assessment and evaluation of the direct and indirect effects of water quality/quantity change on soils and downstream ecosystems dependent on periodic natural flooding (water logging), water quality (soil salinization, irrigation return flows and ecological damage) during the low flow periods, accretion due to changes in the sediment transport regime, social considerations (loss of water access, livelihoods, restricted operations of ferry and navigation etc.), cumulative effects and any potential riparian issues (in the river catchment and downstream of the proposed works) due to the proposed developments (for further notification of planned measures).

5.1.10 Task 2.6: Geological and Geotechnical Investigations

Geological investigations will be conducted during the pre-feasibility stage to such a level for the technical features, dimensions and location of main infrastructures to be sufficiently accurate for minimizing changes and additional investigations during the further phase of the final design studies. Investigations will determine:

- (i) The general geologic and tectonic setting of the site area by analysis of the lithology, stratigraphy, structural geology, and tectonic history in situ and through existing relevant documentation;
- (ii) The geologic conditions related to selection of the dam site (rock type, overburden, fractures, bedding which have a strong influence on the need for foundation treatment and costs);
- (iii) The characteristics of the foundation soils and rocks;
- (iv) Other geologic conditions (such as faults) that may influence design, construction, and long term operation;
- (v) Seismicity and earthquake intensity of the project area; and
- (vi) The sources of construction material in the vicinity of the project area.

The Consultant shall identify and geo-reference for illustration on maps, crucial soil and rock features, establish the engineering properties of rocks and soils, superficial deposits, and tectonic-structural patterns. The extent, depth, and type of exploration will depend on the complexity of the geology and size and type of dam as conceptualized by the Consultant.

At this stage of feasibility study, field investigations will include:

- (i) Geophysical investigations and trial pits at appropriately selected locations for soil identification and assessing engineering properties relevant for project;
- (ii) Geophysical investigations will focus on foundation investigation of irrigation weir and dam axis including the spillway (incl. carrying out geophysical tests as needed, at selected intervals to obtain data on stratification, rock dislocation and groundwater) energy dissipation area, intake area, river diversion works during construction, headrace tunnel, surge chamber, penstocks, power house site (caverns), substation, sources of construction materials, and infrastructure to the site;
- (iii) assessment of uncertainties arising from interpretation of geophysical results and their possible impacts on costs and site viability;
- (iv) Preparation of geological profiles for the irrigation weir and dam foundations, abutments, reservoir rim area and potential project command areas, showing all the geological structures in place and indicating the potential permeability and stability;
- (v) Preparation of geological map of the reservoir floor and rim, drawn to sufficient detail commensurate with the pre-feasibility level to permit identification and assessment of potential leakage paths;
- (vi) Geo-reference with reporting on maps possible sources of construction materials, and carry out basic in situ tests to assess their engineering properties;
- (vii) Desk analysis of the tectonic/ seismic intensity of the area and recommend safety design measures (against sliding of dam slopes, settlements, sliding of abutments, liquefaction of foundations, cracking of dam body, loss of filter zones).

The Consultant will define and incorporate in the ToR for the next phase of full feasibility and final design studies the location, characteristics and number of additional boreholes required to develop geologic correlations and to confirm the type of dam suitable for the site.

The final output of this task will be a Geotechnical Baseline Report - GBR which translates the results of the geotechnical reconnaissance and investigations and previous experience into clear descriptions of anticipated subsurface conditions upon which design consultants may rely at the time of performing the full feasibility and final design studies. The report may also identify the additional information required to reach a satisfactory presentation of the geotechnical assumptions at the base of the design during tender design. The

GBR will be updated as additional information is made available from the investigation campaigns and dedicated studies carried out during tender design stage of the studies. The final version of the GBR will be provided as part of the tender documents.

All investigations that the Consultant describes and quotes in their proposal will be specified according to international standards and criteria for hydroelectric dams such as those of FERC, USBR and ICOLD subsurface investigation criteria, guidelines and manuals, with improvements as recommended by the Consultant.

In their proposal, the Consultant is required to describe the investigations in details by providing description of the proposed activities, quantities that they estimates as necessary, unit prices inclusive of mobilization/demobilization costs, transport and operation of equipment, staffing and associated logistics and conditions of execution.

5.1.11 Task 2.7: Soil Survey Investigations and Land Suitability Studies

Based on findings of the previous reconnaissance study performed by CRIDF the Consultant will assess the suitability of the earmarked land for irrigation and cultivation. They will specifically:

- (i) Undertake a semi-detailed soil survey for the demarcated irrigable command area, using appropriate sampling and observations in conformity with guidelines for soil surveys of Food and Agriculture Organization (FAO);
- (ii) Prepare soil maps on a scale up to 1:10,000 based on these surveys;
- (iii) Collect and analyse soil samples required for the determination of standard physical and chemical properties of the soils required for evaluation of irrigation water requirements and soil suitability for the proposed crops as well as establish proper drainage modules for the project to affect the design of the drainage system for the command areas.

For the latter, the Consultant should take appropriate measures to verify and ensure the quality and reliability of laboratory test results. The Consultant should then:

- (i) Develop a suitable land classification system for assessment of irrigability and drainability within the proposed irrigation development areas;
- (ii) Critically evaluate and analyse findings of the topographic, soil surveys and land characteristics of the proposed project areas; and
- (iii) Identify and delineate the irrigable area in terms of suitability for irrigated agriculture development.

5.1.12 Task 2.8: Analysis of Farming and Livestock Systems

The objective of this task is to provide inputs for the determination of the proposed cropping patterns (task 2.9) and for the outline of the agricultural development strategy (task 3.8). The Consultant will propose a methodology aimed at:

- (i) Describing the main farming and livestock systems in the flood plain and along the river downstream to the dam, their interactions and their links with the river regime; This analysis should focus on farm size, land tenure, cropping patterns and practices, links between livestock and crop farming, input supply and access to agricultural credit and extension, yields, manpower, post-harvest storage and food processing, and marketing;
- (ii) Analysing the gender division of labour in agricultural production, identify the roles and needs of both women and men.
- (iii) Developing crop budgets and farm budgets for the main farming systems for the existing situation,
- (iv) Broadly mapping the farming and livestock systems in the vicinity of the probable irrigation area. This mapping should in particular identify potential conflicts between the development of the irrigation scheme and the livestock practices;
- (v) Determining the main constraints and opportunity for the agricultural development in the area;

- (vi) Assessing the existing irrigation practices and the capability of the rain fed farming systems to switch to irrigated farming systems;
- (vii) Assessing reasons for underutilisation of the smaller existing irrigation system at the Ngingama village, and how these can be mitigated in the Ruhuhu irrigation system;
- (viii) Determining and broadly mapping the areas where the farming and livestock systems rely on the river regime (recession agriculture, grazing areas, etc.).

The methodology proposed should include surveys of focus groups and interviews with key resource persons.

5.1.13 Task 2.9: Marketing Analysis and Determination of Cropping Patterns

The objective of this task is to determine the optimised cropping patterns for the future irrigation scheme. For this purpose, the Consultant shall:

- (i) Based on the soil suitability and climatic characteristics list crops and cropping patterns which could be developed in the future irrigation scheme;
- (ii) Undertake a market analysis aimed at (i) assessing the local, national and regional demand for the suitable crops, (ii) identifying and assessing existing agro-processing and marketing facilities and channels and, (iii) identifying constraints and opportunities in the existing crop value chains;
- (iii) Assess under which conditions new crop value chains could be developed;
- (iv) Prepare crop budgets (future situation) and compare profitability per ha with existing situation;
- (v) Propose optimised cropping patterns taking into account all the above, and assess the financial impact on the main farming systems through developing farm budgets for the future situation.

5.1.14 Task 2.10: Effect of the dam on floods and hydrological regime

The objective of this task is to assess the effects of the proposed storage on existing uses of the water resource and flood plain and undertake flood routing through the downstream channel and floodplain to enable evaluation of effects in the event of excessive spills or dam break (hydrological dam safety considerations). For this purpose, the Consultant shall:

- (i) Collect all information available in records and with local communities on the history of flooding, severity and damage caused by floods in the project areas specifically in the delta part of the Ruhuhu River;
- (ii) Evaluate the flood risk in upstream areas consequent to new water storage facilities;
- (iii) Develop a broad transitory regime hydraulic model from the dam to the lake or any alternative tool which allows to simulate (i) floods control and propagation downstream to the dam and (ii) flood propagation in case of dam rupture;
- (iv) Based on this tool, assess the effect of the dam on the extension of the flooding area, in particular near human settlements and infrastructure both for normal situations and in case of dam rupture. A broad mapping will only be provided in the vicinity of major human settlements and infrastructures.

At least three different type of flood should be simulated.

In addition, the Consultant shall assess the impact of the dam on the river hydrological regime, and evaluate the consequences on the existing water and flood plain uses as well as on the ecosystems. Based on this analysis, the Consultant will propose mitigation measures: reservoir volume, dam management for example.

5.1.15 Task 2.11: Effect of the Project on the Lake Nyasa Hydrology

The Ruhuhu River contributes to approximately 20% of the inflow to Lake Nyasa. It is necessary to assess the impact of the planed water abstractions for irrigation, water supply and the evaporation in the reservoir on the Lake hydrology and uses of the lake water resources. In addition, according to the SADC protocol on shared water courses, riparian countries should be informed of any significant development in transboundary basins.

For this purpose, the Consultant shall assess the impact of the project on the lake hydrology and levels, in particular during the dry season. It should propose mitigation measures aimed at limiting the projects impact, in particular in terms of management of the reservoir (releasing supplementary environmental flows).

5.1.16 Task 2.12: Multicriteria Analysis of Options and Confirmation of the Dam Site and Irrigation Scheme Command Area

The objective of this task is to confirm the dam site and volume as well as the irrigation scheme command area and compare possible options for the various infrastructures, in order to determine the main characteristics of the investment before developing phase 3.

Based on all the investigations and analysis above mentioned, the Consultant will compare possible options in terms of dam site and volume, irrigation scheme location and area, main type of infrastructure (type of dam, type of inlet and spillway structure, location of irrigation inlet, type of irrigation system, canal lining, alignment of feeder canal, etc.).

The Consultant shall rank the options based on a broad multi-criteria analysis including technical, environmental, economic and financial aspects.

The output of phase 2 shall be discussed in the Consultative Committee and Steering Committee (see §7).

5.2 Phase 3: Technical and Economic studies

5.2.1 Task 3.1: Preliminary Engineering Design for the dam and appurtenant structures

Based on findings of investigations relating to the dam and the irrigation weir sites, the Consultant shall:

- (i) Carry out structural and hydraulic designs of the various irrigation weir and dam components including foundations and abutments, dam structure, spillways, energy dissipating works, retaining walls, seepage control and internal drainage systems, river diversion works, intake, bottom outlet and gates, outlet works, terminal works; electro-mechanical system and components, dam instrumentation considering both structural and hydraulic safety;
- (ii) Prepare the layouts and drawings of the different project components using acceptable CAD software at appropriate scales allowing quantity measurements;
- (iii) Propose dam safety monitoring and management systems and corresponding instrumentation; and
- (iv) Prepare a bill of quantities (BoQ) in line with Civil Engineering Standard Methods of Measurement (CESMM 4), for use in cost estimates and the economic and financial, cost benefit analysis of the feasibility study.

The Consultant will issue the corresponding report, showing the various assumption and parameters retained for the design and the dimensioning. The report will describe the methods or computation tools utilized as well as their references. The bills of quantities will be also provided in Excel format.

5.2.2 Task 3.2: Preparation of Outline O & M, Instrumentation and Emergency Preparedness Plans (EPP)

In compliance with the Multilateral Development Institutions and International Instances guidelines, safeguards and operation procedures relating to Dam Safety Plans, the consultant will prepare at the pre-feasibility level of details:

- (i) An outline of the dam Operation and Maintenance Plan;
- (ii) An outline of an instrumentation plan considering both structural and hydraulic safety (plan for the installation of instruments to monitor and record dam behaviour and the related hydro meteorological, structural, and seismic factors, rationale for the instrumentation should be thoroughly documented) and

- (iii) An outline of the Emergency Preparedness plan (specifying roles of responsible parties when dam failure is considered imminent, or when expected operational flow release threatens downstream life, property, or economic operations that depend on river flow levels).

5.2.3 Task 3.3: Preliminary design of a mini hydro-power plant

Thanks to the perennial type of the Ruhuhu River flow at the project site the possibility to install a mini hydropower plant downstream of the irrigation weir has been identified during the previous reconnaissance visits. The Consultant will assess the corresponding potential and prepare pre-feasibility level designs for development of this small hydropower plant, taking advantage of the hydraulic storage infrastructure and the water released for the irrigation schemes and for environmental discharge. Given the small capacity of the plant (estimated at 200kW but to be established by the Consultant) the distribution of electricity generated as well as the operation, management and maintenance of the plant will be likely taken over by the Rural Electrification Agency of Tanzania or a private operator. Detailed tasks will include an electricity sector and local network broad analysis where the Consultant will:

- (i) Identify and map the current existing electricity transport and distribution networks in the area, including transnational connection systems and projects in progress or planned in south west Tanzania;
- (ii) Enquire on the strategies and development plans of the concerned Rural Electrification Agencies in the country as well as options for the future commercial operations of the plant and the associated local distribution network;
- (iii) Analyse the potential local power demand through a broad survey (incl. history and condition of market, trends and growth rates of various consumer groups, tariff and tariff policy, other supply options and their prices, etc.);
- (iv) Undertake a broad load forecast in the targeted areas that the plant can supply (incl. source of forecast, anticipated variation of load, distribution by geographical areas, scenarios and reserve requirements);
- (v) Prepare a load-resource broad analysis for peak and average energy loads and resources (incl. identification of dates when power may be needed and impact of alternative assumptions on need for and timing of project).

5.2.4 Task 3.4: Dimensioning of the mini hydropower plant

The Consultant will conduct broad studies, computations and simulations for determining the size and capacity of the small power plant and its operation parameters. The tasks will cover:

- (i) Determining the flow available for generation (as a result of competing demands, leakage and losses) and establish the duration curve (flow-duration curves, head-duration curves);
- (ii) Definition of the plant type and characteristics (tail water curve, storage-elevation curve, downstream flow requirements, range of expected heads and discharge series, effect of sediment on live storage and the loss of energy generation over time);
- (iii) Optimize energy output consistent with the river discharge assessment established under previous task;
- (iv) Prepare discharge series that represent the flow available for power production, incl. definition of project operating criteria (operating constraints, downstream channel capacity constraints, etc.).

5.2.5 Task 3.5: Energy potential analysis from the main power plant

Preliminary assessment and studies conducted by CRIDF have identified the possibility to install a 300 MW capacity power plant at the dam site. The Consultant will:

- (i) Determine the energy potential of the proposed site given the discharge series and other data developed. Documentation should include but not limited to: the type of analysis (duration curve vs. sequential routing method), model used as well as input assumptions (incl. alternative power installations studied, turbine characteristics, hydraulic capacity, efficiency, head loss, channel routing assumptions, generation requirements);

- (ii) Define power operation criteria including basis for selection of equipment (maximize firm energy vs. maximize average energy vs. maximize dependable capacity, etc., base load vs. peaking, total energy potential for the site, average annual energy, annual and peak demand months generation-duration curves.);
- (iii) Identify a range of plant size and operating options for each developed dam alternative (dam heights, reservoir capacities, project layouts, etc.) informed by the power system requirements and marketability considerations, and select a range of options (operating modes, alternative methods for firming up peaking capacity, etc.);
- (iv) Analyse physical constraints and environmental and non-power operating constraints (e.g. storage releases for water supply, irrigation, flood control regulation, minimum “environmental” discharges for water quality and fish and for minimizing impacts on level and water quality of Lake Nyasa etc.);
- (v) Determine the dependable capacity and compute energy benefits for each developed dam alternative and on the basis of net benefit analysis, select the best plant size;
- (vi) Establish dimensions and prepare the main and auxiliary plant equipment and performance specifications for complete out fitting of the power plant;
- (vii) Prepare pre-feasibility level designs, preliminary performance specifications of the power plant features including: civil works related to the power plant, the hydro-mechanical, and electro-mechanical works;
- (viii) Undertake preliminary design of the system for evacuation of electricity produced by the power plant into the market, including connection to the substation of the national grid with due coordination with TANESCO requirements and plans. This will include: confirmation of design data (including but not limited to the transmission voltage, levelised current value, amortized life (40-50 years), location of evacuation line corridor, field effects of the transmission lines and environmental constraints) The study shall include an assessment of the reinforcement needs with the existing grid and suggest the corresponding measures to be implemented and correlated cost;
- (ix) Prepare technical layouts and drawings of the proposed power plant (including intakes, headrace and tailrace canals, penstocks, powerhouse, etc.) and evacuation line infrastructure using Computer Aided Design software;
- (x) Prepare a bill of quantities and cost estimates for the hydro-mechanical, electro mechanical and evacuation line, for input into economic, cost benefit and financial analysis.

5.2.6 Task 3.6: Evacuation Line alignment and Survey

Through desk work supported by an analysis of satellite imagery available on the Internet, the Consultant will identify the possible alignment and the route of the evacuation HV line from the plant switchyard site to the substation which will be designated by TANESCO. Based on this broad analysis, the Consultant will establish the cost and technical characteristics of the HV line (Pylons types and conductors, sub-stations). The scope of the additional studies and surveys will be incorporated in the ToR for the Full Feasibility study.

5.2.7 Task 3.7: Irrigation System Preliminary Design

The reconnaissance study performed by CRIDF has already identified the areas where irrigation cultivation can be planned. Based on this available information, the Consultant will develop the preliminary design of the primary irrigation scheme infrastructures. They comprise: the diversion weir and the associated sand trap works, the main irrigation canal, the works for the river crossing to supply water to the northern bank, the buffer storage dam and the primary feeding canals leading to the future areas of irrigated plots. The detailed layout of irrigated lots will be established further at the time of the Feasibility and final design studies once the agro development strategy is finalised based on the findings of market study and the consultative process conducted with all stakeholders and beneficiaries. The detailed activities will be to prepare preliminary designs for major structural and hydraulic elements of the proposed irrigation system, including, the main water conveyance system. The Consultant shall prepare the layouts and drawings of the different major project components using AUTOCAD software. Drawings will be at appropriate scales allowing the accurate

evaluation of quantity of works and their corresponding costs and will allow to easily divide the irrigated surfaces when allocation of land to farmers/operators will be implemented. The consultant will prepare the schedule of quantities of good level of accuracy allowing to estimate the corresponding construction costs

The specific tasks will be to:

- (i) Carry out outlined design and layout (at the appropriate scales allowing to establish bills of quantities of good accuracy) of the irrigation system and the associated hydraulic structures considering the total demand, economy and base flow availability. The designs will set the locations of structures and water profiles along canals which is most economical, easily manageable and aligned with topographic features and geological investigations; due attention should be given to the possibilities of crossing irrigation and drainage canals by human and livestock movements. The consultant will, in consultation with the client, the SSEA consultant and local community leaders select the locations of such crossings.
- (ii) Outline the flood protection requirements for the command area and outline the respective drainage system accordingly;
- (iii) Select the main canal lining requirements using the inputs from the engineering geology/geotechnical assessments;
- (iv) Prepare general plans and drawings for the weir site and irrigation scheme main infrastructure;
- (v) Locate access roads, which will give easy access to selected access points to the command area;
- (vi) Prepare bill of quantities and indicative construction schedules accordingly. The work items and construction schedules will be presented to the EA and other stakeholders, for discussion and approval.

With respect to groundwater, the Consultant should also assess:

- the future ground water regime and behaviour after the development of irrigation in the project area;
- impacts on the ground water table due to seepage and percolation and drainage from the irrigation canals;
- Drainage control, groundwater table, and ground water quality control measures that need to be incorporated into the detailed design of the project later.

5.2.8 Task 3.8: Outline of an Agricultural Development Strategy

The development, the management and then operation and maintenance of the irrigation scheme will involve mainly individual farmers. At the level of the feasibility study the Consultant will identify the main axes of an Agricultural Development Strategy aimed at fostering efficient, professional and market-oriented agricultural value chains. This strategy will then inform future phases of the Ruhuhu Irrigation project studies and specifically the phase of implementation, when the focus will be on putting in place the enabling environment, capacity enhancement of the different players, as well as attracting private investment (agro-products processing facilities for example) to complement the public irrigation investment.

Based on the findings of tasks 2.8 and 2.9, the Consultant shall propose a comprehensive and integrated set of measures aimed at enabling the environment for the development of the agricultural value chains in the project area. This set of measures should be linked with the current and planned public programmes in the agricultural sector, and should seek to promote the development of contractual arrangements between farmers and agro-food industry such as out-growers' schemes. It should propose appropriate and equitable mechanism to integrate larger private agri-business investors already active in Tanzania.

The outline of the agricultural development strategy should address the main bottlenecks and opportunities identified in task 2.8 and propose measures and programme in the following fields:

- (i) Land consolidation and land tenure;
- (ii) Access to agricultural credit;
- (iii) Input supply;
- (iv) Agricultural extension;
- (v) Post-harvest processing and storage;

- (vi) Marketing;
- (vii) And more generally improvement of the crop value chain.

For each of these fields, the Consultant shall broadly describe the objective, cost, institutional arrangements, and cost recovery mechanisms of the proposed measures.

The Consultant will also propose specific reforms/conditions to be in place to roll out the strategy, as well as other actions required to facilitate investment and smallholder engagement. The outline of the agricultural development strategy will be discussed in a specific workshop involving the main stakeholders of the agricultural sector.

5.2.9 Task 3.9: Infrastructure for Auxiliary Water Resources use

The Consultant shall assess the potential and undertake pre-feasibility level designs of measures for auxiliary uses like water supply and rural development infrastructure etc. These shall be done taking into consideration development plans and priorities of Tanzania for the region and districts, or any other riparian issues that may arise because of the project. The Consultant will also incorporate technical, environmental and socio-economic aspects, in order to guarantee the sustainable use of the available resources. The detailed tasks will consider the following aspects of Water Supply Development for local communities.

The Consultant will determine the potential for development or expansion of water supply for domestic, municipal and industrial uses, at and around the project area. The Consultant will:

- (i) Establish the current levels of access to water for domestic, municipal, industrial use, etc.;
- (ii) Assess the functionality or service level of any existing water supply systems or water sources;
- (iii) Prepare pre-feasibility level designs and layouts for bulk transmission to the extent that water supply can benefit from the irrigation development and dam project;
- (iv) Assess the situation as far as sanitation is concerned and propose sanitation systems in association to the water supply schemes to be included in the project.

5.2.10 Task 3.10: Design for Flood Mitigation Developments

- (i) The task objective is to assess the remaining risk of flooding in the project area once the dam is in operation, during periods of maximum spillage. The Consultant will assess potential damages from future flooding/spillages to the proposed project infrastructure, to human settlements, infrastructure including irrigation, drainage system and hydraulic structures, and crops. The design of flood mitigation developments will derive from the findings and parameters established under task 2.10. More specifically, the Consultant should: Identify major structural and non-structural measures to prevent adverse impacts to communities, infrastructure and crops in the project area; and
- (ii) Prepare pre-feasibility level measures, layouts and cost estimates which can be taken to avert floods under the planned project.

5.2.11 Task 3.11: Rural Feeder roads and river crossing

There is a strong link between the poor state of rural infrastructure and rural poverty frequently compounded by the lack of mobility of populations. The Ruhuhu River crossing has been identified as an important deterrent to the development of economic activities and trade of commodities in the area. The task objective is to outline a rural road network to take into account marketing and social opportunities, within the framework of government road programs. Assessment will include the desk identification of the potential rural road as well as river crossings within the project area. The Consultant will map the recommended networks connecting the command areas and linking them to locations of settlements and primary points of access to the market or to future storage, processing or commercialization facilities. The Consultant will estimate the corresponding costs for incorporation in the economic feasibility computations.

5.2.12 Task 3.12: Environmental and Social Impact Overall Appraisal

A Strategic Social and Environmental Assessment (SSEA) study is assigned to another consultant independently from these pre-feasibility studies. Nevertheless, the Consultant is required to appraise the environmental and social aspects of the project including land acquisition and resettlement sensitivities in each project area and, through the consideration of alternate project designs, develop project proposals that avoid or minimize potential adverse environmental impacts. The options retained for the design as well as the location of infrastructures will be made in consultation with the consultant in charge of the SSEA study.

Specifically, the Consultant should:

- (i) Assess environmental and social impacts that could make the project non-feasible or financeable, or result in costs likely to exceed the intended benefits when mitigation is taken into account;
- (ii) Estimate the extent of resettlement and land and asset acquisition that would be associated with the project, and develop a preliminary concept of a socio-infrastructure development program for the area (roads, community facilities for education, health, sport and social activities);
- (iii) Examine design alternatives such as changes in dam location, alignment, height, reservoir size, access road alignment, material sources (borrow areas), etc. and make comparison of such alternatives, in technical, economic, social and environmental terms, so that the best recommendations are passed on to the team members working on the engineering aspects for incorporation in the project designs.

The depth of the appraisal will be sufficient to adequately inform the development of alternate project designs, the selection and justification of the preferred alternative. Project alternatives that substantially convert or degrade important natural habitats should not be considered unless they include equivalent habitat restoration and maintenance within the project area or elsewhere. Design features to avoid adverse impacts, minimize land acquisition and involuntary resettlement, or enhance environmental/natural resource services are to be clearly noted in the description of preferred project alternatives, with suitable maps. Acceptability of the final project design will depend not only on its technical and financial feasibility, but also on its environmental and social suitability, including transboundary considerations.

The Consultant should provide and exchange with the Consultant in charge of the SSEA, documentation of the environmental and social information and analyses used to design the projects, of the measures included to avoid or minimize adverse impacts, and of project plans to manage adverse impacts. In particular, the Consultant shall collaborate closely (through liaison and regular meetings) with and provide support to the Consultant hired to conduct the SSEA, for the assessment of potential impacts and design of mitigation measures. Other areas of collaboration/exchange of information will be determined from time to time, in order to enhance the quality of the study outputs.

Under this task relating to environmental matters, the Consultant will also assess the potential of the project for contributing to green growth economy. They will determine and substantiate how the project can help the country and societies become more resilient as its multipurpose nature contributes to meet demands for food production, transport, energy and water.

5.2.13 Task 3.13: Considerations on Climate Change

The AfDB is currently rolling out a Climate Safeguard System (CSS) as a set of decision-making tools and guides that enable the screening of projects in vulnerable sectors for climate change risks and to identify appropriate adaptation measures to reduce vulnerability. As a result of the nature of the project, a preliminary assessment has classified the Ruhuhu Multipurpose Dam, Irrigation and Hydropower project as a development which may be very vulnerable to climate risk (Category 1). This will require a detailed evaluation of climate change risks and adaptation measures, and the development of comprehensive risk management and adaptation measures which are to be integrated into the project design and implementation plans.

The Consultant will refer to practices and guidelines issued by relevant government agencies and development institutions. They aim to provide the principles and steps to mainstream climate change into water resources programmes and water infrastructure selection and implementation.

Under other studies and technical assistance, CRIDF is funding consultancy and expert's services for assessing the Climate Resilience of the project and perform a Climate Change Variability Assessment.

Through coordination and exchange of information with the CRIDF Climate Change experts, the Consultant will:

- (i) Confirm the initial CSS screening classification;
- (ii) Undertake hydrological modelling to determine changes to the flood regime and dam inflow caused by climate change effects assessed by CRIDF;
- (iii) Estimate impacts and risks on the viability of the Ruhuhu dam, including (but not limited to): (i) reduced inflows; (ii) higher reservoir evaporation; (iii) infrastructure damage due to changing flood regimes; (iv) changes to water borne diseases; (v) risks of eutrophication and salinization; (vi) risks to increased siltation;
- (iv) Estimate impacts of climate change on flood and drought in the catchment area upstream;
- (v) Identify and discuss potential impacts of climate change on beneficial uses of water from the dam, including potential increase failure to meet design specifications (irrigation, hydropower, flood control, etc.);
- (vi) Estimate the additional costs for required infrastructure adjustments to manage climate change related risks;
- (vii) Estimate potential amounts of GHG emissions from the proposed reservoir, and the amount of GHG emission offset through the generation of energy from the hydropower plant;
- (viii) In conjunction with CRIDF activities relating to Strategy for Financing Project Implementation Advise the government on possible alternative financing possibilities from dedicated climate change mitigation funds;

5.2.14 Task 3.14: Economic and Financial Analysis

The Consultant shall perform the economic and financial analysis of the project for determining the usual indicators and parameters allowing further decision on the funding and implementation of the project. The Consultant will:

- (i) Compile and tabulate estimated incremental direct financial benefit streams from the agriculture/irrigation component as well as the hydropower component using constant prices (or suitably applied price projections if realistic) and appropriate assumptions; estimate likely build-up of agricultural production volumes over the years following the initial investments and likely future agricultural production trends in a without-project situation. The benefits shall include power benefits (Main HPP station and Mini HPP), irrigation benefits, flood control benefits, water supply to communities, fish farming benefits, benefits from other water uses along the reservoir area and navigation benefits;
- (ii) Undertake project economic and financial analysis using standard techniques (for the irrigated agriculture as well as hydropower generation and other identified uses). This should include determination of the financial and economic viability of the project, by carrying out analyses to determine the net present value (NPV), cost benefit analysis (CBA; B/C ratio), Net benefit – investment ratio (N/K) and financial and economic internal rates of return (FIRR, EIRR), including different discount rates;
- (iii) The Consultant should also perform sensitivity analysis on important parameters (including calculation of switching values) to check their impact on the financial and economic viability. The consultant should clearly list what assumptions are made and which key developments are needed to reach FIRR and EIRR.

The economic analysis should be performed based on economic costs, calculated with specific conversion factors. It should first address separately the economic profitability of the hydropower scheme and of the irrigation scheme, and assess in a second stage their joint profitability.

The financial analysis should first assess the possible tariff structure for both irrigation and HPP and then evaluate the financial sustainability of: (i) the various farming systems and, (ii) the institutions in charge of managing the irrigation scheme and HPP scheme.

The key information for the project shall be presented in tabular format together with key environmental and social information. The Consultant should also provide documented analysis in Excel spreadsheets and based on this analysis make final recommendations on the way forward.

5.3 Phase 4: Preparation of ToR for the further studies

The Consultant will prepare the Terms of Reference for the next steps of the project studies which are the following:

- The detailed ToR for the full Feasibility Study and Final Design of the project including the preparation of the Tender Dossier for implementation;
- The detailed ToR for implementing a comprehensive consultative process based on a participatory approach with all stakeholders and beneficiaries for defining the most appropriate institutional and operational set-up of the agro-irrigation component;
- The detailed ToR for an agro-development strategy study for establishing the cultivation and crop patterns offering the maximum of revenues and rewards to the beneficiaries;
- The draft ToR for the independent Dam Safety Panel of Experts (PoE) in line with the requirements of the Operation Policy 4.37 of the World Bank.

For each of these ToR/studies the Consultant will estimate the volume of required efforts (number of experts man-months and required profiles), the associated costs and expenses and the corresponding execution calendar.

5.3.1 Task 4.1: ToR for the Feasibility Study, Final Design and Tender Dossier

The terms of reference will describe the extent of studies to be performed for bringing the project to a level of final design and definition allowing to estimate accurate construction and operation costs as well as project financial outputs in the agro and electricity sectors. Though the project is of multipurpose type, the ToR should distinctively delineate the 2 components in order to allow the possibility of their separate implementation. The ToR should require establishment of accurate Bills of Quantities and Technical Specifications to be part of the tender documentation for inviting bids from contractors for implementation of the infrastructure works. In compliance with practices and requirements from IFI's for funding dam project, the Consultant will incorporate in the ToR the provision (as well as corresponding estimated costs) for the involvement of a Dam Safety Panel of Experts (PoE) in charge of assessing the aspect of safety during the phases of the feasibility studies and the preparation of the hydropower scheme Final Design.

The draft ToR will be submitted to a review by the EA. The final version will incorporate the remarks and suggestions made during the EA's review. The ToR will be delivered to the EA under computer format. Forms and bills of quantities will be provided under Excel format.

5.3.2 Task 4.2: ToR for the Consultative Process and the Agro-development Strategy

Given the that there is no proven experience of irrigation cultivation in the project area, it is appropriate at the next phase of Feasibility Study to implement 2 specific studies for determining in close consultation with local beneficiaries and various stakeholders the institutional and operational arrangements required for the efficient

implementation of the agro-irrigation component of the project. The Consultant's task is to establish the corresponding Terms of Reference on the basis of the results and findings of the Pre-feasibility studies. The ToR will describe the problematic already identified by the Consultant during the PFS, the objectives of the studies, the main tasks to be performed and the profiles of experts to be mobilized.

5.3.3 Task 4.3: Cost estimate of the further studies

The Consultant will estimate the amount of funds required to cover the costs of the above mentioned studies (FS, Final Design and Tender Dossier, the Consultative Process and the Agro-development Strategy). The estimate will separate the categories of costs amongst: i) Cost of personnel including professional fees and overheads, ii) associated expenses (travel, boarding and local transport), and iii) Cost of surveys and investigations. For the later, the Consultant will support the cost estimate with a detailed bill of quantities defining the type, number and scope of the surveys and investigations that they consider necessary in the light of their knowledge of the project acquired during the performance of the feasibility study. The cost estimates will be without Tanzanian taxes except those applicable to the Consultancy services contracts in their source countries. The cost estimates will be established and delivered to the EA in Excel format

5.4 Phase 5: Funders mobilization

All along the performance of the Feasibility study, the Consultant will develop and maintain activities for assuring that the maximum of stakeholders is aware of the studies and project progress. The main objective is to mobilise additional funds for the execution of further studies as required under the ToR prepared under the previous Phase 4 of the Pre-feasibility study. The medium term objective is also to sensitize the international donors active in Tanzania as well as private investors and infrastructure development funds to the business opportunities offered by the project in the agriculture/irrigation sector as well as the electricity production/supply sector. Given the aspect of Climate Change Resilience of the project, possibilities for mobilizing interest and funds of recently created funds/facilities and financing instruments in relation with reduction of Climate Change and Global Warming will be systematically explored.

5.4.1 Task 5.1: Project information and promotion

The Consultant will prepare the documents describing the project to be distributed to various stakeholders and selected media and information channels. The document will be under the form of a Project Information Memorandum (PIM) providing sufficient information and data for the readers to be fully aware of the project main components, dimension, purpose and objectives. The PIM may be adjusted from time to time for reflecting the progress of the studies and the updated information. In coordination with the EA, the Consultant should prepare specific information material to be presented during donors 'meetings, workshops or consultations held in and out of Tanzania.

5.4.2 Task 5.2: Funders' Roundtable

Within 2 months prior to the end of the pre-feasibility studies, a Funders' RoundTable will be organized. The Consultant will prepare the presentation material for the meeting as well as the documentation to be distributed to the attendance. The Consultant's main experts /Team Leader and Deputy Team Leader and 1 expert in the agro-irrigation sector and 1 expert in the hydropower sector will attend and manage the roundtable. They will establish the minutes and the report of the roundtable proceedings. The Team Leader will support the EA during initial bi-lateral meetings with potential funders. The specific objective of the roundtable is to i) secure funds for the performance of the further studies ii) mobilize interest and obtain pledges from donors to earmark funds in their respective investment programs for funding the construction of the project(s) ii) test the appetite of private investors and developers for the implementation and operations of the projects components. The EA will decide whether private sector operators can attend the roundtable, depending on the institutional and financing structure proposed for the project(s) implementation and operation.

5.5 Reports and deliverables

The study will result in a set of comprehensive reports (Details provided further in these ToR) summarising the different options for the community in terms of the site/s available and for the hydropower component the scale of generation. The likely income from the project components, key assumptions made, variations of costs and specific reports on critical aspects of irrigation and hydropower development projects, etc. will be captured in the study reports. The study should also include a high level risk assessment based on the identified options and provide clear recommendations for the Owner/Executing Agency (EA) Study Coordination Unit on how best to develop the project(s) and any specific requirements for later project phases.

The Pre-feasibility Study report shall include, but not be limited to the topics, listed below with appendices where relevant, all at a pre-feasibility level of detail. It is requested that the report clearly delineates the Irrigation and the hydropower component as self-standing documents, and that the TOR for further studies are separate documents ready for tendering.

- (i) Executive Summary and Conclusions including Key Project(s) Features and Characteristics
- (ii) Description of Project(s) Area
- (iii) Topographical Survey and Mapping
- (iv) Geological and Geotechnical Conditions
- (v) Hydrology, Flood Studies, and Sedimentation
- (vi) Environmental and Social Impact aspects (Strategic Environmental Assessment (SSEA) to be independently conducted by another consultant)
- (vii) Plant Optimization, Design and Engineering (civil, electrical and mechanical works including access roads & bridges, construction power and water supply, construction facilities, etc.)
- (viii) Drawings and guiding sketches
- (ix) Market survey for trade, processing and export of crops and commodities
- (x) Outline of the Agricultural Development Strategy and Agro business opportunities
- (xi) Cost Estimate of project infrastructures and indicative construction schedules
- (xii) Terms of Reference, cost estimate and recommended implementation calendar and duration for the additional studies
- (xiii) Financial and Economic Analyses including cost/benefit ratio analysis
- (xiv) Risks, Conclusions and Recommendations

The Reports prepared during the pre-feasibility for each project/subject shall be produced in Draft and Final versions. During the study period, the draft reports will be provided in electronic version only. The final version of the Pre-feasibility reports, including all annexes will be provided in electronic version and in 10 hard copies.

The following table indicates the type of reports to be produced at specific dates:

Sr.	Report Title	Delivery Date (End of month ...)	Nab and type of copies
1	Inception Report	2.5	Electronic
2	Sites Reconnaissance and Investigations Draft Report	6.25	Electronic
3	Sites Reconnaissance and Investigations Final Report	7.0	Electronic + 10 Hard Copies
4	Feasibility Draft Report	12.5	Electronic
5	Feasibility Final Report	14.0	Electronic + 10 Hard Copies
6	Draft ToR for the full Feasibility Studies and other studies	14.25	Electronic
7	Final ToR for the full Feasibility Studies and other studies	15.0	Electronic + 10 Hard Copies

8	Minutes and proceedings of the Donors' roundtable	14.5	Electronic + 10 Hard Copies
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The Consultant shall submit the Inception Report after completion of desk study, literature review and field reconnaissance. The Inception Report shall include the review of previous study reports and all other relevant reports, maps, data and information. The Consultant shall verify (or propose modification), after site reconnaissance as necessary, of the project layout and locations of main infrastructure works. Based on information collected, the project work plan (as presented in the Consultant's proposal) shall be updated and presented in the Inception Report. Any major modifications must be approved by the Client.

The Consultant shall submit the Draft Final Reports incorporating the comments made by The EA SCU and Committees based on their professional knowledge and experience. The Consultant has to present the findings contained in the Draft Final Report to the EA including concerned stakeholders. The venue and date of presentation will be fixed by mutual consultation. The suggestions and comments provided at the presentation will also be duly incorporated by the Consultant in the final reports.

The Final Report shall include the complete feasibility study of the project including outline design, project optimization, sketches and drawings, quantity and cost estimates, indicative construction planning, power evacuation plan, economic and financial analysis and other details as mentioned in the scope of work. It shall also incorporate the recommendations made in the approved SSEA Report and findings of the other studies and technical assistance provided by CRIDE. The Consultant will also present the consolidated report to the EA. The comments and suggestions made in presentation are to be duly incorporated in the Final Report. The Consultant shall submit an electronic version of the complete report on compact disk or USB memory stick in addition to the hard copies of the reports in requisite number as mentioned above. The electronic version of the report shall include the complete report, drawings and all calculations (in actual working format, xls, dwg, doc) compatible with mainstream software.

6. Coordination, Steering and consultation

The coordination of the studies will be assured by a Study Coordination Unit (SCU) established at the Executing Agency premises. A Steering Committee and a Consultative Committee will be also set up. The Steering Committee will guide implementation of the project and validate studies outputs, it will review and endorse the reports, select the best option, and provide guidance to the Executing Agency. It will comprise senior representatives from the concerned Ministries (MEM, Agriculture, Water and Irrigation, Environment and Finance) and Utilities. The Steering Committee will hold meetings each time as needed by the progress of the studies.

The Consultative Committee composed of representatives of concerned line ministries, Government officials and representatives of the civil society and various stakeholders. The Committee will assure a consultative role on matters relating to institutional and legal matters and ensure that the project is developed and designed in compliance with the government policies and strategies in the various concerned sectors. The Consultative Committee will hold meetings on a quarterly basis during the duration of the studies.

When appropriate from time to time and upon request from the Executing Agency, the Consultant will be invited to attend the Committees meetings. Associated costs and expenses for delegating its representatives to such meetings are deemed to be included in the Consultant's financial proposal.

7. Personnel of the Consultant

The Consultant shall make available personnel with the qualifications and experience necessary to perform project tasks to a high standard necessary for the completion of each project component and the entire assignment. The individual qualifications and tentative responsibilities of each consultancy team member are

presented in the following. The Consultant can propose a single expert for several positions if they have the relevant qualification and experience.

Team Leader Water Resources Development Projects Specialist

Qualifications: The Team Leader (TL) shall be a professional engineer with proven experience in Water Resources Management activities that include large (preferable multi-purpose) dams and be familiar with large dam design, development of irrigated schemes and planning and construction disciplines. They shall have a minimum MSc degree qualification and a minimum of twenty (20) years overall experience and fifteen years (15) years relevant experience on similar dam design projects and proven experience in leading multidisciplinary teams and/or team leader for externally financed projects preferably in developing countries. Fluent in written and spoken English and an ability to draft concise reports; good communication skills; excellent computer skills, working experience with project management systems are essential.

Responsibilities: The Team Leader will be responsible for the overall management and coordination of the overall studies and cooperate closely with the Executing Agency project team and counterpart decision makers. Responsibilities will include but not necessarily limit to: (i) Manage, coordinate, and ensure quality assurance and timely delivery of all deliverables of the assignment; (ii) Manage the relationship with the EA and the overseeing bodies of the project; (iii) Supervise and guide the individual experts and ensure that they are coherently engaged in studies activities to collectively deliver the required outputs; (iv) Manage the procurement of project related third party services and project related equipment; and (v) Take a lead in the preparation and submission of reports and deliverables of the assignment.

Dam Civil Engineer and Deputy TL

Qualifications: The Dam Civil Engineer shall be a professional engineer with proven experience in large dam design, planning and construction disciplines. They shall have a M.Sc. in Civil Engineering or equivalent and a minimum of 15 years overall experience and 10 years relevant experience on similar dam design projects in developing countries.

Hydrologist

Qualifications: The Hydrologist shall be a professional with proven experience in hydrological data analysis and modelling in connection with river basin management and dam designs in developing countries. They shall also have proven track record in (i) climate change modelling and scenario building, and (ii) climate change impacts on river basins and associated economic activities and large-scale infrastructure, including dams. The hydrologist shall also have experience in hydrological and flood modelling related to the multi-purpose benefit assessments in cooperation with the economist. They shall have a minimum MSc degree qualification in a relevant field with a minimum of fifteen (15) years overall experience and ten years (10) years relevant experience.

Hydro-morpho-dynamic Engineer

Qualifications: The Expert shall have documented experience in the field of hydro-morpho-dynamic and experience in similar large projects. They shall have a minimum BSc degree/Advanced Diploma qualification and have a minimum of 8 years overall experience and 5 years relevant GIS experience in similar assignments.

GIS Mapping Expert

Qualifications: The Expert shall have documented experience in GIS based topographical and thematic mapping digital thematic and experience in similar large projects. They shall have a minimum BSc degree/Advanced Diploma qualification in GIS and have a minimum of 8 years overall experience and 5 years relevant GIS experience in similar assignments. They will be conversant with the use of data base deriving from LIDAR surveys for establishing maps for the design of large hydropower schemes and irrigation projects.

Geologist

Qualifications: The Geologist shall be a professional engineer with proven experience in the planning and design of large dams' geological investigation works and safety analysis. They shall have a minimum MSc degree qualification in a relevant field and will have a minimum of 20 years overall experience and 15 years relevant experience.

Geotechnical Engineer

Qualifications: The Geotechnical Engineer will possess a Master degree in Geotechnical subjects and proven experience in geotechnical investigations and analysis including safety aspects in the context of planning and design of large dams and command areas. They shall have a minimum MSc degree qualification in a relevant field as well as post graduate qualifications in dam design. They shall have a minimum of fifteen (15) years overall experience and seven years (10) years relevant experience including surface exploration of physical conditions of sites, geophysical methods, and sub-surface investigations.

Electromechanical Engineer

Qualifications: The Expert shall have documented experience in electromechanical subjects, design of hydropower plants and experience in similar large projects. They shall have a minimum BSc degree/Advanced Diploma qualification and have a minimum of 8 years overall experience and 5 years relevant experience in similar assignments.

Hydro-mechanical Engineer

Qualifications: They shall be a professional hydro-mechanical engineer with proven experience in hydropower design and planning assessments in developing countries. The engineer shall have a minimum BSc degree qualification in a relevant field as well as post graduate qualifications in demand assessment and development of water utility services. They shall have a minimum of fifteen (15) years overall experience and seven years (7) years relevant experience.

Power Engineer Hydropower

Qualifications: The Hydropower engineer must have a proven experience in design and assessment of hydropower plants and associated infrastructure related to large dam projects. They will have a minimum MSc degree qualification in hydro-power engineering and minimum of 15 years overall experience and 10 years relevant experience from similar projects.

Power Engineer Transmission

Qualifications: The Power transmission engineer must have a proven experience in design, O&M and assessment of transmission systems and associated sub-stations and infrastructure related to large dam projects. They will have a minimum MSc degree qualification in electrical engineering and minimum of 10 years overall experience of high voltage transmission system design and construction and 5 years relevant experience from similar projects.

Civil Engineer

Qualifications: The Civil Engineer must have a proven experience in design and assessment of various civil works and infrastructures including road-works, appurtenant structures of dams and hydropower plants, underground works, hydraulic canals related to large dam and irrigation projects. They will have a minimum BSc degree qualification in civil engineering and minimum of 10 years overall experience in large infrastructure and construction and 5 years relevant experience from similar multipurpose dam projects.

Economist/Financial Expert

Qualifications: The Economist shall have a minimum Master degree qualification in economy –as well as relevant post graduate qualifications. The Economist shall have a minimum of fifteen (15) years overall

experience and seven years (7) years relevant experience. They shall have proven experience in the economic analysis related to construction of large multi-purpose schemes and, cost benefit analysis, and multi-purpose benefit modelling of water projects including economic benefits attributed to irrigation development, tourism, water supply for domestic and economic uses.

Hydraulic Engineer

Qualifications: The Hydraulic/ Engineer will possess a Master degree in hydraulics and proven experience in flow mechanics and hydraulic modelling and analysis in the context of planning and design of large dams and hydraulic infrastructures. They shall have a minimum of 10 years overall experience and 5 years relevant experience in similar projects.

Flood Management Specialist

Qualifications: The Flood Management Specialist will possess a Master degree in hydraulics, civil engineering or any relevant discipline and proven experience in flood management projects. They shall have a minimum of 10 years overall experience and 5 years relevant experience in similar projects.

Irrigation Engineer

The irrigation engineer will be responsible for assessing the irrigable potential, identification irrigation projects and estimation of water requirement; assessment of water use efficiency; costing and prioritisation of irrigation development in the area and preliminary design of primary infrastructures and estimate of the cost of the schemes.

Qualifications: A minimum Master's Degree in Irrigation Engineering with at least 15 years of relevant experience in irrigation planning, design and implementation particularly in Africa.

Agro-development Specialist

Qualifications: A minimum of Master's Degree in agronomy or agro-economics with a minimum of 10 years of experience in the socio-economic evaluation and design of agriculture projects in developing countries.

Rural development Engineer

Qualifications: Master Degree in rural development engineering. They shall have minimum 10 years of experience in studies of rural development and related infrastructures design and operations in similar agro-development projects in Africa.

Expert Participative Approach and Consultations

Qualifications: With at least 10 years' experience in developing and implementing participatory planning strategies, preferably for agro-irrigation development context. Experience must include extensive field consultations with a range of stakeholders. The Specialist should be knowledgeable about the local institutional and social structures and be proficient in Swahili.

Soil specialist/Pedologist

Qualifications: Postgraduate qualifications in soil sciences and at least 10 years of experience in soil and pedological investigations for irrigation projects, cultivation methods design and watershed management projects in sub-Saharan Africa.

Fisheries Expert

Qualifications: The Fisheries Expert will possess at least a Master degree in Fisheries or any relevant discipline and proven experience in feasibility studies in Africa. They shall have a minimum of 10 years overall experience and 5 years relevant experience from similar projects.

Tourism Expert

Qualifications: The Tourism Expert will possess at least a Master degree in Tourism Development or any relevant discipline and proven experience in feasibility studies in Africa. S/he shall have a minimum of 10 years' overall experience and 5 years' relevant experience.

8. Duration of studies and Costs

The duration of the studies is estimated at **15 months**. Proposals should indicate how the funds will be best utilized to achieve the objectives of the assignment. All of the Consultant' costs incurred in their participation, the costs of specialized sub-contractors for surveys, costs for supporting the arrangement and running of national and regional workshops must be included in the consultant's financial proposal, the costs of all other consultations, coordination meetings etc. required for the Consultant to adequately complete the assignment must be included in the financial proposals.

9. Data and Services to be provided by the Client

Existing data and documentation on hydrological, meteorological, water quality and other relevant aspects of the Ruhuhu River basin which the recipient may have will be made available to the Consultant; however, the Consultant has the ultimate responsibility for collecting the required data and documentation which cannot be made available by the project from official sources. The Client will:

- (i) Facilitate in establishing communication with the relevant institutions;
- (ii) Liaise and assist the consultant in obtaining any other information and documents required from other government agencies in Tanzania and other countries of SADC and which the Client considers essential for conducting of the assignment;
- (iii) Provide assistance to obtain work permits for staff of the Consultant;
- (iv) Provide assistance in obtaining Customs and Tax Exemptions as detailed in Special Conditions of the Consultancy Agreement and General Conditions of Service;
- (v) Arrange consultative meetings and ensure linkage with relevant regional authorities;
- (vi) Provide any document on request that the consultant may identify and require in the course of the pre-feasibility studies; and
- (vii) Inform the Consultant on the progress of other studies (Pre-feasibility, other studies and technical assistance) in order that he can coordinate and exchange information as required.

The Consultant shall operate their own project office and shall bear all accommodation, local transportation, visas, and other costs necessary to carry out the assignment.

Annex 1: Map of Tanzania and Project area



Annex 2: Indicative calendar of the pre-feasibility studies

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	
Component 1: Pre-Feasibility Study																	
Phase 1	Data and Information Collection	[Blue bar]															
	Inception Report																
	Remarks and comments from EA																
Phase 2	Site reconnaissance and Investigations				[Blue bar]												
	Draft Report on findings and data																
	Remarks and comments from EA																
	Final Report on findings and data																
Phase 3	Techno-economic studies								[Blue bar]								
	Draft Pre-feasibility Report																
	Remarks and comments from EA																
	Final Pre-feasibility Report																
Phase 4	Drafting of Feasibility Studies ToR																
	Draft Version of ToR																
	Remarks and comments from EA																
	Final Version of ToR																
Phase 5	Funders' mobilisation								[Hatched bar]								
	Funders' Roundtable																
	Minutes and proceedings of Funders' Roundtable																
Component 2: Other studies and technical Assistance (CRIDF)																	
2.1	Climate resilience assessment																
2.2	Financing plan for implementation																
2.3	International Notification Process																
Component 3: Strategic Social & Environmental Assessment (SSEA)																	
Component 4: Study Coordination and Management																	

Annex 4: Terms of reference for the SSEA Studies

United Republic of Tanzania

Strategic Social and Environmental Assessment Study for The Kikonge Multipurpose Dam, Irrigation and Hydropower Project

Terms of Reference

November 2015

African Water Facility | Facilité africaine de l'eau

African Development Bank | Banque africaine de développement

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Annex 1: Indicative calendar for the SSEA Studies

Annex 2: Map of Tanzania showing the project location

Annex 3: Indicative Thematic structure of the ESIA

Acronyms and Abbreviations

AfDB	African Development Bank
AWF	African Water Facility
DANIDA	Danish International Development Agency
DFI's	Development Financing Institutions
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GoT	Government of Tanzania
GPS	Global Positioning System
WWF	World Wildlife Fund
IFI	International Financing Institution
IUCN	International Union for Conservation of Nature
NGO	Non-Governmental Organisation
PCS	Public Consultation Strategy
PoE	Panel of Experts
RAP	Resettlement Action Plan
SADC	Southern African Development Community
SSEA	Strategic Social and Environmental Assessment
ToR	Terms of Reference
TRIPDA	Tripartite Regional Infrastructure Project Data Base

1. Introduction

The African Water Facility (AWF) received requests for funding to support project preparation through Feasibility Studies and Environmental and Social Impact Assessment Studies introduced in November 2014 by Tanzania Electric Supply Company Limited (TANESCO) and the National Irrigation Commission (NIC) on behalf of the Government of Tanzania (GOT) for development of an irrigation project and the development of a hydropower scheme on the Ruhuhu River in the south-west of the country.

The Ruhuhu irrigation project first appeared at the SADC Water Sector Infrastructure Investment Conference which was held in Maseru in September 2011. It also appeared in the SADC Infrastructure Investment Conference that was held in Maputo in July 2013. It is included in the SADC Regional Infrastructure Development Master Plan of August 2012. The project is listed in the COMESA-EAC-SADC Tripartite Regional Infrastructure Project Data base (TRIPDA) dated 20 June 2013 established during the Regional Infrastructure Conference under the item # 838: “Ruhuhu Valley Irrigation Scheme (Project P1-12)”. The Ruhuhu Irrigation project is included in the National Irrigation Master Plan.

The site for the dam (for hydropower generation and water storage) was initially identified in the 80’s through a scoping study funded by DANIDA, the Danish International Development Agency on behalf of the Ministry of Water. Subsequently in 2013, a team of experts of CRIDF conducted a reconnaissance mission in Tanzania and on-site which led to confirm the basic features of the scheme and its appropriateness for the development of a multipurpose dam project including the development of an irrigated area of 4,000 ha. The Kikonge Hydropower project is now being entered into the Power Supply Master Plan presently under revision.

2. Project Description

The project infrastructure comprise i) an irrigation scheme, covering 4,000 ha, including a derivation weir, the main canal, the downstream command areas, a mini hydropower plant and water supply systems to the local communities and ii) a hydropower scheme including a 120 m high dam, a storage reservoir of 6 Bm³ capacity 60 km long and a 300 MW power plant and the various appurtenant infrastructures. The Annex 2 provides a map of Tanzania showing the project area.

3. SSEA purpose

The project has the potential to make significant changes to the environment of the region due to the implementation of large infrastructure works. As a result, it is necessary in compliance with the Tanzanian regulations and practices to carry out a targeted Strategic Social and Environmental Assessment (SSEA) on behalf of local and government officials to address potential induced and cumulative impacts so as to facilitate informed, holistic decisions by these officials and the communities they represent, on future development of the area and its surroundings.

The SSEA will also help ensure compliance with the African Development Bank and other Development Institutions Guidelines and Gender Policy. It is intended to prepare the phase for the more narrowly-focused Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) which will be conducted. This SSEA will also reference and integrate various management and planning tools currently in use and planned by the line ministries concerned with such a project.

The generic purpose and objective of the SSEA is to identify and assess environmental, social and economic effects of policies, plans and programs, including the effects of future development and investment. This process should precede decision-making and allow for the identification of alternatives, minimally at the pre-feasibility level. The SSEA will provide inputs to, and influence, the more detailed feasibility and design process, not just to document project-specific impacts and suggest long term mitigation tools and recommend policy.

A principal objective of the SSEA process will be to consolidate and evaluate existing baseline data and potential environmental impacts relevant to the development of the project, to identify gaps in this information and the stakeholders' key concerns, fill the gaps as needed. Importantly, the Consultant will use this information to produce useful guidance for forward planning, design and management of the project, the form and content of which will be agreed among key stakeholders through the ongoing consultation process, in Task 1.

Some definitions that have been used by Development Finance Institutions (DFIs) for SSEA are:

- *SSEA is a systematic process for evaluating the environmental consequences of proposed policy, plan or program initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision-making on par with economic and social considerations.*
- *The formalized, systematic and comprehensive process of evaluating the environmental effects of a policy, plan or program and its alternatives, including the preparation of a written report on the findings of that evaluation, and using the findings in publicly accountable decision-making.*
- *SSEA is a process directed at providing the authority responsible for policy development (the proponent.) (during policy formulation) and the decision-maker (at the point of policy approval) with a holistic understanding of the environmental and social implications of the policy proposal, expanding the focus well beyond the issues that were the original driving force for new policy.*

The principal goal of the SSEA process is to ensure that investment in the improvements to the Ruhuhu Multipurpose Dam, Irrigation and Hydropower project do not cause unacceptable environmental, economic and social impacts (program cumulative or Project-specific) and that any adverse impacts can be avoided or mitigated through improvements in the Project design.

4. General Scope of the SSEA

Based on participatory consultations with stakeholders, including local and regional governmental authorities, civil society (including NGO's and industry representatives) as well as communities, the Consultant will provide information on the Ruhuhu project and seek feedback so as to ensure that all derivative SSEA recommendations have a high degree of utility to both planners and communities. Based upon the results of the consultation, the Consultant will carry out a comprehensive survey of the environmental and social constraints and opportunities to growth at local and national levels, as a result of the project implementation and other infrastructure construction. Some of those tools and planning documents, which are listed below in Task 2, (including those currently under development) should be considered in the institutional analysis of the proposed forward planning, design and management actions.

The guidance developed will provide tools for future phase such as Resettlement Action Plans (RAP) and Environmental and Social Management Plan (ESMP) frameworks for the future investments and socio-economic activities impact management assessments.

The SSEA is envisioned as a process to enhance the planning and implementation of the project, not just the production of documents. The Consultant will consult extensively with the GoT, communities, resource management entities, NGO's, and private sector stakeholders to ensure that the SSEA has a high degree of utility and buy-in to be used in the multi-sector planning and resource management of the Ruhuhu Multipurpose Dam project.

An important aspect of the study, is that an SSEA should be both comprehensive and undertaken early enough in the Project development process to provide useful information to decision makers with respect to the

proposed project, as well as other near-to-medium-term development projects in the area that may be initiated to complement the project. An inherent element in the conduct of an SSEA is the consultative process, which should be meaningful and participatory. The Consultant will identify and take into consideration all initiatives, programs and studies on progress or previously performed in the project area at large and will assure coordination with the ongoing activities performed by the Consultant in charge of the Pre-feasibility studies.

5. Detailed Scope of Tasks

The SSEA will be rolled-out in several phases comprising the specific tasks described hereafter.

Phase 1: Public Consultation Strategy.

The Consultant will propose, develop and implement a Public Consultation Strategy to:

- a) Support the SSEA process;
- b) Provide the GoT with public and stakeholder feedback on all aspects of the project implementation;
- c) Develop a process to support the ongoing requirements for public consultation on environmental and social issues during implementation of the planned project as well as future development projects and that;
- d) Gather key information that drives the output of the SSEA process, determining what information local authorities and communities need in order to manage long term impacts of the Ruhuhu Multipurpose Dam, Irrigation and Hydropower project.

Phase 2: Strategic Social and Environmental Assessment.

The assessment will comprise scoping activities and establishment of the socio-environmental baseline. The Consultant will produce an SSEA and a scoping report for the project with supporting frameworks, analyses, and data, meeting the requirements laid out below in the task descriptions and the “Deliverables” section of these TOR.

Phase 3: Terms of Reference for the full Environmental and Social Impact Assessment study (ESIA)

The Consultant in charge of the SSEA and on the basis of the findings will establish the ToR for the further performance of the full detailed ESIA study, including Environmental and Social Management Plans (ESMP) and Resettlement Action Plans (RAP). These ToR will be required to be approved by the relevant Tanzanian Authorities.

5.1 Phase 1. Public Consultation Strategy

In consultation with the officers of the Tanzanian Authorities responsible for environmental matters, the Consultant will develop and implement a Public Consultation Strategy (PCS). The implementation of this strategy will provide the public and other stakeholders with comprehensive relevant information about the project and its intended impacts on communities, resources, receive comments (making sure that these are routed to the appropriate groups potentially impacted by the project and respond to these comments as appropriate.

The process will ultimately inform the output, scope and scale of recommendations that the SSEA will produce. The Consultant will ensure that this process is participatory and inclusive, ensure that both men and women, public and private actors are able to voice concerns and speak to future needs. This procedure will establish and maintain an ongoing dialogue between the public, the Technical Partners (Donors community), the Project proponents, and involved agencies and line ministries of the GoT. The PCS will have the following objectives:

- Ensure that the public understands that their concerns are important to the GoT and to the output of the SSEA process.

- Keep affected persons and other stakeholders informed of activities related to the proposed project.
- Provide information and comments regarding the Activity and the SSEA process.
- Seek feedback from key stakeholders on what information, data, planning tools and subject areas may have the greatest utility for their work.
- Allow the stakeholder consultative process to drive the scale and scope of the SSEA recommendations.
- Provide a unified channel for dissemination of information about the progress of the environmental and social assessment process and the environmental and socio-economic issues.
- Identify issues and potential areas of concern to avoid and/or resolve conflict.
- Provide timely information to local, regional, and national officials.

5.2 Phase 2. Execution of the SSEA

5.2.1 Legal and regulatory framework

The Consultant will develop the Ruhuhu project SSEA and carry out the requirements of the TOR within the context of the following guidance:

- Tanzanian laws and regulations regarding the environment and infrastructure;
- The various planning and management tools already in use in Tanzania including, but not limited to:
 - National EIA Guidelines
 - National Investment Guidelines
 - Five-year Strategic Plan
 - Upcoming Tourism Development Management Plan
 - IFI's Operational Policy on Involuntary Resettlement
 - Various related impact management documents and tools recently applied for large infrastructure projects including related Environment Reports, ESIA report, etc.

The SSEA shall describe the scientific approach adopted to carry out the studies. In particular, the models, methods and criteria used in the studies shall be presented and explained. The reports shall also include maps and drawings at the appropriate scale and refer to all consulted documents.

5.3 Contents of the SSEA

The contents of each section of the project SSEA are detailed below:

5.3.1 Purpose and Relevance of the Proposed Project

The Consultant will describe the global rationale for developing the project (poverty alleviation, economic development, etc.) that identified the Ruhuhu Multipurpose Dam, Irrigation and Hydropower project Ruhuhu project and led to existing studies, government plans, or private sector investment decisions. Some may come from information received during public consultation. Specialty studies may be required to strengthen and/or verify the assumption of need for the Ruhuhu Project (such as the compilation of regional planning and economic information; Ruhuhu River ecology studies; feasibility studies for other planned projects in the catchment area or other developments; legal review of the actions; GPS-verified maps of the catchment area and its resources; protected areas; gender assessments; the project region ecological and social carrying capacity; etc.).

The SSEA process is not intended to produce in-depth studies, so the specialty studies will not go beyond desk studies that assemble information available from various government, NGO, research, academic or international donor organizations, and ongoing related studies. However, the Consultant will assess information available and may propose additional in-depth site specific studies where they are required to be

included in the scope of the further ESIA studies. It may be beneficial to ground truth desk studies with cognizant parties through the consultative process, such as the WWF, IUCN and other organisations dealing with environmental and climate change matters. Where there is inadequate desktop information (especially in protected/vulnerable areas or in gaps in resource management, tourist management, HIV/AIDs awareness and prevention programs) the Consultant will carry out needed analyses highlighting the presence/absence of specific/appropriate environmental or social resources.

5.3.2 Approach and Methodology for the SSEA

The Consultant will describe the approach and methodology used in the SSEA and how the data and information collected, including those derived from the consultative process, has been prioritized and incorporated in the findings, recommendations and on-going advisory support to the project responsible ministries and agencies, local and regional governmental organizations and civil society actors. This section includes any preconditions and assumptions made in predicting and assessing the potential environmental and social benefits and risks, as well as deficiencies in data used and uncertainties in predictions. For each environmental and social/cultural resource, the Consultant will define a set of impact significance criteria. The Consultant will receive input and comments from GoT and other stakeholders, including cognizant NGOs and private sector actors, before finalizing the set of significance criteria. The Consultant will use environmental checklists, “limits of acceptable change”, or other appropriate tools as a framework to identify key potential impacts (positive and adverse, short or long term) of the project.

5.3.3 Environmental policy, legislative and planning framework

The Consultant will identify GoT policies, legislation (including international treaties and obligations), and regulations and to other ongoing development programs in the project area. The Consultant will discuss the extent to which the Project is consistent with this framework, with existing Environmental Guidelines and Gender Policy; and with applicable international environmental and social assessment standards. The Consultant will assess the resources and capacity of the regulatory and implementing agencies responsible for environmental protection and planning for implementation and oversight of environmental and social issues relevant to the agriculture/irrigation sector and the natural water resource management sector. These agencies may include central government organizations as well as local authorities in nearby districts of the project sites that may be affected by its development and implementation.

5.3.4 Alternatives

The Consultant will describe alternatives to the proposed project (can be categorised per domain: Irrigation, electricity generation and distribution, roads and access, water supply) in consultation with corresponding sectoral authorities/ministries/agencies that may have been considered in other studies performed by GoT and others in the development of these sectors. Alternatives should include, at a minimum, the null or no-action option. The Consultant will identify any additional alternatives or modifications to the proposed project that may become obvious. This information will be used by the GoT and the Consultant in charge of the Pre-feasibility studies to further define the project or to inform future investments that would open up in the area of influence of the project (mining and logging activities as example).

5.3.5 Scoping

Once the Project has been analysed through research and consultation, and the need documented, the Consultant will develop a scoping report for the SSEA. This report will include documentation of comprehensive consultation with all stakeholders about the project and its long term implications and other ongoing development programs in the region. It is presumed that the scoping of the SSEA will be, in large part, informed by the concerns and preferences of the local stakeholder, public officials, private industries, NGO’s and communities as well as from a review of relevant guidance, an analysis of alternatives and gaps in baseline information.

5.3.6 Relevant Environmental and Social Baseline Information

The Consultant will describe the environmental and social baseline conditions for the potentially impacted area and its surroundings, including the driving forces for the proposed action and other ongoing or potential major activities/projects that may influence the Project's purpose, need and design. Major activities/projects will include all public and private sector projects that are under development (approved planning, design, or construction in the sector of agriculture and irrigation, mining, HV lines and interconnections, fisheries, navigation, transports and bridges, forestry and logging) and known to GoT. The Consultant will also provide an organizational chart which shows the key institutions involved in all approval and design of new major activities/projects and the guidelines, laws and policies which frame the activity's design and implementation.

The Consultant will utilize existing or develop enhanced data management techniques, including the use of GIS, as appropriate, to ensure that project-level environmental assessment and planning are done using the best available, consistent and comprehensive baseline information, particularly in areas of high biological diversity and social/cultural significance. The Consultant will use as much as possible the information that is already available in various forms for projects of comparable purpose, nature and size. The Consultant will identify existing environmental conditions including social, economic, and other aspects of major environmental and social concern as they relate to the project. The report should cover the physical environment; biological - biodiversity, ecology and nature conservation, including existence of protected areas or other sensitive locations; social, cultural, and economic conditions including prevailing land use in each affected district; community structures, capacity and ability to cope with environmental and social impacts related to accelerated growth induced by the project implementation, principal livelihoods; fishing practices; agricultural practices, including pesticide and herbicide availability, use, storage, and disposal; infrastructure; principal human health issues, including HIV/AIDs risks, transmissions and sexual transaction markets; identification of ethnicity, local social organization and traditional authorities that inform future planning and mitigation decisions; land tenure issues in each affected district; and health and safety issues. The baseline should also identify and address the needs and conditions of vulnerable groups and how women, in particular, participate in and benefit from growth. The information gathered will be assessed as to its quality and sources identified. The Consultant will develop a comprehensive bibliography of information sources for the SSEA, and will use, as appropriate, GIS or other database techniques that will facilitate further analyses, showing potential new investments, markets, and other natural and community resources.

Given that the Ruhuhu River contributes to about 20% of the inflow to the Lake Nyasa, already at the level of the SSEA, special attention will be given to the following specific subject. A significant fishing activity exists on the Lake Nyasa and along the Ruhuhu River providing significant inputs to the population diet and economic activities. The main catch is *Opsaridium Microlepis* (locally known as Mbasa) which is endemic to Lake Nyasa (Jackson et al., 1963; Tweddle, 1987) and the species is mostly caught while on spawning runs in large rivers, the Ruhuhu River being the most important. *O. Microlepis* is a pelagic economically important cyprinid in Lake Nyasa area, however, the catches of *O. Microlepis* have declined tremendously and it is now regarded as a threatened species. The species was found to make spawning runs in the rivers during the dry season when the water turbidity was low. In the Ruhuhu River the species makes these runs during the dry season, a fact which is different from Malawi Rivers where spawning runs take place during the rainy season. It is not known what factor(s) make the Ruhuhu the same species spawns in Malawi Rivers during the rainy season. The very high turbidity in the Ruhuhu River during the rainy season is likely to be the main determinant which makes the species to make spawning runs during the dry season. This phenomenon seems to be compounded by the high turbidity of the river prevailing even during the dry season as a result of uncontrolled upstream activities and practices (Alluvium gold mining, improper agricultural practices, deforestation and inexistent water catchment basin management and protection). In the light of the above and if a large dam is implemented on the River, the spawning runs would be restricted unless appropriate measures are designed.

5.3.7 Impact Assessment for the Proposed Project and Alternatives

This impact assessment will emphasize the identification of environmental, economic and social effects of the implementation of the planned Ruhuhu project, together with potential indirect and/or cumulative impacts expected from other programs, initiatives, trends going on in the region. Impacts will be defined according to the Significance Criteria defined above and be informed by the consultative process. The SSEA will include a matrix of impacts identifying and discussing the severity of consequences/ hazards, the probability or risk of impact events occurring, the major groups and/or individuals affected (disaggregated if relevant, by sex and income) and the potential to manage the event if it does occur. Viable alternatives (only those that address the purpose and need of the project) will be subject to the same level of analytical detail as the proposed project. An area of concern is the inclusion of potentially disadvantaged people, including fishermen and farmers in the Ruhuhu River Basin. The SSEA will assess the degree to which the poor in the area and other affected communities are impacted and are able to benefit from the accelerated socio-economic development as predicted in the project rationale/outcomes, and will discuss possible mitigation measures for those perceived to be potentially, negatively impacted. Further, the SSEA will review evidence in the field that women and men will participate equitably in the benefits and management of the project impacts (e.g.: new livelihoods, increased access to markets, social services etc.), and, where needed, propose policy enhancement or mitigation measures.

5.3.8 Mitigation of Environmental and Social Impacts

A practical method to implement mitigation measures for the risks posed by local investment (including the project) is the core result of the SSEA. The SSEA will be a resource for acceptable mitigation measures to be included into the short and long term policy and planning tools developed by the GoT and other actors. It should be developed in direct reference to the findings of the consultative process, to further the likelihood that the recommendations can be used by other projects/ actors when and as directed by GoT. The SSEA will develop and propose the following methods: inclusion of social and environmental mitigation measures, best management practices, enhanced and formalized community consultation and participation in long term management planning; means to respond to contingencies and emergencies; requirements for special studies where risks and mitigation measures are not known. The SSEA will also prioritize mitigation measures and provide cost estimates for their implementation.

5.3.9 Management Guidance/ planning tool.

This guidance, as noted previously, will be defined and developed through the consultative process. It will include recommendations for policy makers, investors, planners and communities to be able to guide and cope with accelerated growth. Possible components of the planning tool may include: recommendations for practical and cost-effective mitigation actions associated with typical development projects, tourism activities, and the fishing industry; measurable outcomes for sustainable development, time lines, funding sources, and responsibilities; identification of capacity building needs and actions to strengthen local or national institutions and other major stakeholders. The planning tool may include an environmental monitoring plan, including defining measurable environmental indicators and an HIV/AIDs prevention plan. These indicators could be succinct and representative so as not to merely reflect compliance with mitigation measures, but facilitate the gauging of the overall positive or negative environmental and social effects of the multipurpose project activities. It is emphasized that the indicators need to be a combination of process (to track progress in taking recommended actions) as well as outcome measures. The document may also define commitments on the part of the various implementers and stakeholders, as relevant, and will include consequences of failure to carry out these commitments. This may include the development of Community Agreements designed to ensure sound environmental stewardship and effective execution of the project.

5.3.10 Conclusions and Recommendations

The Consultant will provide a set of coherent recommendations regarding the environmental and social effects of the proposed project, and potential improvements or modifications to the project based on the evaluations and consultations undertaken with key stakeholders and the Consultant in charge of the techno-economic Pre-feasibility studies. The SSEA should formulate recommendations for long- term planning tools, including costs, actors identifying key risks and issues.

5.3.11 Document Consultation Process

All consultations carried out during the course of the SSEA process (see Task 1) will be documented and presented as an annex to the SSEA report. Documentation should include minutes of meetings, lists of persons consulted and/or attending meetings, and any documents or official correspondence received from stakeholders regarding the SSEA report. Where appropriate, the documentation will include responses to questions or concerns raised during the consultation process or received during the course of the SSEA from NGOs, the public or other stakeholders. The SSEA report should contain a complete set of bibliographical references used by the Consultant.

5.3.12 Terms of Reference for the ESIA studies

In line with the findings of the SSEA and in compliance with Tanzanian laws, regulations and practices as well as those of IFI's, the Consultant will prepare the ToR for the future ESIA studies which will be performed when additional funding is secured at the completion of the feasibility study. Annex 3 provides guidance relating to the standard content of the ESIA studies and reports. The Consultant will also estimate the cost and funding needs for the ESIA studies, including provision for an Environmental and Social Panel of Experts (PoE) in charge of assessing the compliance of the ESIA studies with practices and requirements of IFI's for dam projects. The Consultant will also prepare the outline of the ToR for this PoE in line with the requirements of the Operation Policies of the World Bank, specifically OP4.01 on Environmental Assessment, OP4.12 Involuntary Resettlement and OP7.50 on International Waterways.

6. Deliverables and Calendar

The overall duration of the SSEA is estimated at 5 months (or 20 calendar weeks). The deliverables are as indicated below.

6.1 Preliminary Work plan

Within 15 days of mobilization (commencement of the study), the Consultant will produce a preliminary work plan. This work plan shall reflect the intended approach and methodology, as well as the anticipated timeline.

6.2 Scoping and Consultation Report

Within 5 calendar weeks of the commencement of the study, the Consultant shall prepare and deliver to the Executing Agency, a Scoping and Consultation Report which summarizes the methodology and key findings of the Consultation process to-date. The Report will analyse the initial Consultation findings, and prioritize any key needs identified as described in Task 2.5.

6.3 Draft SSEA Report

Within 15 calendar weeks of commencement of the study, the Consultant shall prepare and deliver to the Executing Agency a Preliminary Draft SSEA Report covering the reporting structure described above. The report will include relevant data and shall be made public to the GoT (including the National Environmental Management Council (NEMC)) and other key stakeholders for public comment. It will also be posted on the Bank/AWF website as a draft report.

a) Within fifteen days of the publishing of the Draft SSEA Report, the Consultant will assist the GoT in holding public meetings, consultations, and/or hearings to obtain input from stakeholders and the public on the SSEA. Minutes of these meetings will be submitted to the Executing Agency and included in the Final SSEA.

6.4 Final SSEA Report

Within 2 weeks of submittal of the Draft SSEA (15 weeks from the commencement of the study), the Consultant shall prepare and deliver to the Executing Agency a Final SSEA Report covering the reporting structure described above, including relevant data, and addressing the input obtained in the consultation occurring after the Draft SSEA is published. The final SSEA will be made available to GoT (including NEMC), to appropriate Stakeholders, and to the public, and included on the Bank/AWF website. The Final SSEA will include all key risks and findings as well as all recommendations for short and long term mitigation including accountable persons and costs.

6.5 Terms of Reference for the ESIA studies and POE

The overall duration for the preparation of the ToR for the ESIA study including the draft ToR for the POE is estimated at 4 weeks further to the holding of public meetings and hearings. After the SSEA Final Report is delivered to the Executing Agency, the Consultant will have 2 calendar weeks for finalizing the Terms of Reference of the full ESIA studies. The Annex 3 provides guidance on the scope of the ESIA studies and resulting reports.

Deliverables will be provided to the EA in electronic format. The final SSEA report will be delivered in electronic format and 10 hard copies.

7. COORDINATION, STEERING AND CONSULTATION

The coordination of the studies will be assured by a Study Coordination Unit (SCU) established at the Executing Agency premises. A Steering Committee and a Consultative Committee will be also set up. The Steering Committee will guide implementation of the project and validate studies outputs, it will review and endorse the reports, select the best option, and provide guidance to the Executing Agency. It will comprise senior representatives from the concerned Ministries (MEM, Agriculture, Environment and Finance) and Utilities. The Steering Committee will hold meetings each time as needed by the progress of the studies.

The Consultative Committee composed of representatives of concerned line ministries, Government officials and representatives of the civil society and various stakeholders. The Committee will assure a consultative role on matters relating to institutional and legal matters and ensure that the project is developed and designed in compliance with the government policies and strategies in the various concerned sectors. The Consultative Committee will hold meetings on a quarterly basis during the duration of the studies.

When appropriate from time to time and upon request from the Executing Agency, the Consultant will be invited to attend the Committees meetings. Associated costs and expenses for delegating his representatives to such meetings are deemed to be included in the Consultant's financial proposal.

8. STUDY DURATION AND STAFFING

The anticipated duration of the assignment will be approximately five months from notice to proceed. Knowledge of local conditions, social and cultural practices, and Tanzanian laws and regulations will be essential to accomplish these tasks. Prior experience conducting SSEAs or sector-based environmental assessments and impact management tools, particularly within the water resources management and mobilization sector, is highly desirable.

The following minimum Key Personnel will be required for the assignment:

Team Leader. Environmentalist, preferably with at least 15 years of international experience, having an advanced degree, English language capacity and broad knowledge in environmental and social impact assessment and mitigation. They should have significant experience in undertaking environmental assessments, reporting, capacity building, and environmental advisory services.

Ecologist Wildlife biologist: With at least 15 years of experience, having an advanced degree in environmental or natural sciences. Previous regional experience of assessment and baseline establishment for environmental studies, protection of flora fauna and special biotopes and ecosystems in Africa.

Sociologist/Gender Impact Assessment Specialist: With at least 15 years of experience and advance degree in social and human sciences. Previous experience in participating in Socio-Environmental impacts studies and surveys in Africa for large infrastructure projects.

Expert Participative Approach and Consultations: With at least 10 years' experience in developing and implementing participatory planning strategies, preferably for infrastructure development context. Experience must include extensive field consultations with a range of stakeholders. The Specialist should be knowledgeable about the local institutional and social structures and be proficient in Swahili.

Natural Resources Management specialist: With at least 15 years of international experience, having English language capacity and broad knowledge in regional development planning, and institutional strengthening. Experience in socio-environmental studies and on site surveys within the scope of large infrastructure projects planning and development.

9. Data and Services to be provided by the Client

Existing data and documentation on socio-economic patterns, hydrological, meteorological, water quality and other relevant aspects of the Ruhuhu River basin which the recipient may have will be availed to the consultant; however, the consultant has the ultimate responsibility for collecting the required data and documentation which cannot be made available by the project from official sources. The Client will:

- (i) Facilitate in establishing communication with the relevant institutions;
- (ii) Liaise and assist the consultant in obtaining any other information and documents required from other government agencies in Tanzania and other countries of SADC and which the Client considers essential for conducting of the assignment;
- (iii) Provide assistance to obtain work permits for staff of the Consultant;
- (iv) Provide assistance in obtaining Customs and Tax Exemptions as detailed in Special Conditions of the Consultancy Agreement and General Conditions of Service;
- (v) Arrange consultative meetings and ensure linkage with relevant regional authorities; and
- (vi) Provide any document on request that the Consultant may identify and require in the course of the SSEA studies.
- (vii) Inform the Consultant on the progress of other studies (Pre-feasibility, other studies and technical assistance) in order that he can coordinate and exchange information as required.

The Consultant shall operate their own project office and shall bear all accommodation, local transportation, visas, and other costs necessary to carry out the assignment.

Annex 1: Indicative calendar for the SSEA Studies

	Months	1				2				3				4				5					
		Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
3.1	Phase 1: Public Consultation Strategy. (6 Weeks - 1.5 Months)	■																					
3.1.1	Presentation of Preliminary Work Plan		◆																				
3.1.2	Presentation of Scoping and Consultation Report					■																	
3.2	Phase 2: Strategic Social and Environmental Assessment. (12 Weeks - 3 Months)					■																	
3.2.1	Publication of Draft SSEA Report to EA and Stakeholders																						
3.2.2	Public meetings and hearings																						
3.2.3	Corrections and Amendments of Report																						
3.2.4	Edition of Final SSEA Report																						
3.3	Phase 3: Drafting of Terms of Reference of the ESIA studies (4 weeks - 1 Month)																						
3.3.1	Review by the EA																						
3.3.2	Finalisation of ESIA ToR																						

Annex 2: Map of Tanzania showing the project location



Annex 3: Indicative Thematic structure of the ESIA

This Appendix is provided as a guidance for the Consultant for conducting the SSEA studies and for establishing the ESIA terms of reference. It only gives an example of the structure of the ESIA report but does not limit the scope of the studies to the listed subjects, the Consultant remaining responsible for including, developing and deepening other aspects and domains that his surveys, enquiries and studies will identify as critical for the particular project.

Policy, Legal and Administrative Framework

This chapter concerns the policy, legal and administrative framework within which the ESIA is carried out. It presents the relevant environmental and social policies of the national (in Tanzania) legal requirements and related constraints (e.g. practices that may discriminate or exclude any stakeholder group) relevant to the project. It provides information on the environmental requirements of any co-financiers, and identifies relevant international environmental/social agreements to which the country is signatory.

Project Description and Justification

The first part of this chapter shall describe the proposed project and its geographic, ecological, social, economic and temporal context: project location, various project components, capacity, construction activities, facilities, staffing, working conditions, availability and source of raw materials, production methods, products, schedule of works, land tenure, land use system, potential beneficiaries, affected groups (directly and indirectly), and offsite investments that may be required. It shall at least include a map showing the project location and area of influence.

The project justification should be based on combined economic, environmental and social assessments. To this end, this chapter shall describe the current situation in the sectors concerned by the project, explain the problems or the needs to be satisfied and present the constraints associated with the project implementation. The technical features of the project (layout, location of main works, capacities and size, technical and operational specifications, etc.) will derive from the Feasibility Studies performed by the technical Consultant, thus requiring that both Consultants exchange, discuss and harmonize the findings of their respective studies and activities.

Description of the Project Environment

This chapter shall first determine the limits of the study area that shall be defined in order to encompass all project direct and indirect impacts. The description and analysis of the physical, biological and human conditions shall address relevant environmental and social issues within this area, including any changes anticipated before project implementation.

Within the human environment, key issues that shall be considered include population characteristics and trends, revenue disparities, gender differences, health problems, natural resource access and ownership, land use patterns and civil society organization level. A particular attention shall be given to the rare, threatened, sensitive or valued environmental and social components.

The information presented shall be relevant to decisions about project location, design, operations as well as environmental and social management. Maps, figures and tables shall be included in this chapter to better illustrate the various environmental and social components.

Project Alternatives

This part of the ESIA Report consists in analysing the various feasible alternatives of the project, including the "without project" option and the option of replacing the dam with other investments in the catchment to satisfy and achieve the same objectives. The selected alternative shall be the most environmentally and socially sustainable, taking into account the technical and economic feasibility. The evaluation of possible

alternatives is deemed to be performed by the technical Consultant for the Feasibility Studies through a multi-criteria screening process.

Anticipated Impacts and Mitigation/Enhancement Measures

This chapter presents a detailed analysis of beneficial and adverse impacts of various components of the selected project alternative on the physical, biological and human (social, cultural and economic) environments. The below long-list of impacts and concerns of different relevance for the Ruhuhu Multipurpose Dam, Irrigation and Hydropower project will serve as a check list for the assessment of E&S impacts.

- Increase in economic activity and employment;
- Induced development due to new opportunities such as in fisheries and dam related projects (water supply, irrigation, hydropower, tourism etc.);
- Possible disruption of existing activities particularly floodplain agriculture and artisanal fisheries downstream;
- Loss of livelihood for those who are living and/or cultivating the land in the flooded areas;
- Disruption of activities in catchment areas, particularly if they represent potential sources of pollution for the reservoir or generate silts and sediments;
- Development of additional skills for those taking advantage of new opportunities;
- Uncertainty and increased perturbations due to a lack of information and communication;
- Development of new infrastructures;
- Destruction of existing infrastructures in the dam and reservoir area;
- Reliable water supply for irrigation, domestic and other uses;
- Contamination of domestic water supplies due to the mismanagement of the reservoir;
- Increased pressures on existing social services due to migration and resettlement;
- Degradation of air quality by dust, heavy machinery atmospheric emissions and waste disposal and increase in ambient noise during the construction period;
- Flood control, design of cofferdams and temporary diversion works;
- Interruption of surface water flows during and after construction;
- Possible changes in the level of groundwater table resulting from changes in the drainage and water flow;
- Contamination of surface and underground waters and soils by spilling of wastewater and hazardous materials;
- Alteration of water flow downstream impairing agricultural activities on floodplains;
- Proliferation of aquatic weeds in reservoir and downstream impairing dam discharge, irrigation schemes and fisheries;
- Degradation of the reservoir water quality;
- Runoff erosion resulting in sedimentation problems;
- Landslides and other types of soil movements in the works areas;
- Soil compaction and erosion during construction;
- Soil erosion and potential landslides due to water level changes in the reservoir;
- Loss of productive soils by flooding;
- Soil destabilization as a result of excavation;
- Destruction of ecosystems of particular interest;
- Degradation of ecologically sensitive areas;
- Loss of biodiversity;
- Destruction of vegetation;
- Loss of forest products (fuel wood, timber, non- timber forest products, medicinal plants);
- Impact on the fish species;
- Creation of a new fish habitat in the reservoir facilitating fisheries development;
- Loss of existing wildlife and fish habitats;
- Disruption of wildlife migrations;

- Increase in poaching due to non-resident workers;
- Adverse impact on fishes due to changes in water flow and limnology, disruption of fish migrations, and degradation of water quality;
- Loss of sites of cultural, archaeological or historical importance by flooding/impounding;
- Loss of productive land and natural resources in impounded areas;
- Disruption of natural resources exploitation activities, particularly fisheries;
- Derangement of livestock grazing and traditional agriculture, particularly flood recession agriculture;
- Insufficient arable land to satisfy subsistence agricultural needs;
- Loss of territory for local populations;
- Changes in land and water uses, access and rights, that can lead to social conflicts;
- Increased pressure on natural resources due to migration;
- Social conflicts associated with the venue of migrant workers and new settlers (divorces, ethnic tension, etc.);
- Degradation of the visual quality of the landscape due to land clearing, construction works, new infrastructures, etc.
- Health and safety impacts;
- Etc.

The methodology of assessment, based on a rigorous scientific method, shall be first presented. Then all environmental and social, direct and indirect, short and long-term, temporary and permanent impacts shall be described and assessed, indicating their importance level and their probability of occurrence. The importance level may be assessed on the basis of the nature, extent, intensity and duration of the impact, as well as on the sensitivity of the concerned environmental and social components and perceptions of the public. Irreversible or unavoidable impacts shall be clearly identified. Cumulative effects shall also be addressed taking into account other projects or actions planned in the study area.

Appropriate mitigation measures shall be identified to prevent, minimize, mitigate or compensate for adverse environmental and/or social impacts. Moreover, enhancement measures shall be developed in order to improve project environmental and social performance. Roles and responsibilities to implement measures shall be clearly defined. The cost of the measures shall be estimated, including the cost for environmental and social capacity building and gender mainstreaming, if necessary. Residual impacts shall be presented.

The below long-list is meant to serve as a guiding check-list for the assessment of E&S impacts and mitigation measures.

- Give preference to local employment (men and women) and local inputs (food, basic material) to the extent possible;
- Offer appropriate compensations or alternative income opportunities to men and women having a reduced access to or loosing productive means;
- Ensure that the poor and other vulnerable groups can continue to safely satisfy their basic needs;
- Provide adversely affected people, men and women, with the training required to benefit from new opportunities;
- Plan information, education and communication activities during and after project implementation to increase awareness of all users (men and women) on safety measures that shall be followed;
- Before construction, consult concerned ministries to verify the adequacy of current and proposed infrastructures;
- Involve the population (men and women) in the maintenance and management of new infrastructures to ensure their sustainability;
- Ensure adequate social services, including drinking water supplies and sanitation facilities, for addressing the basic needs of the local populations, non-resident workers and migrants;
- Assist social service administrations in coordinating their efforts to offer additional services and improve service delivery if required;
- Promote safety net measures to protect the poor and other vulnerable groups against a service price increase;

- Establish quality control for water supplies and sanitation facilities;
- Near residential areas, avoid noisy works after regular working hours;
- Maintain vehicles and machinery in good condition in order to minimize gas emissions and noise;
- Use dust and noise attenuators, such as vegetation hedges along transport corridors in order to minimize noise and the aerial transport of dust;
- Plan and set up on-site sanitary facilities for the disposal of wastewater;
- Maintain vehicles, machinery and equipment in good condition in order to avoid leaks and spill of hazardous materials (hydrocarbons, chemical products, etc.);
- Ensure a safe management of hazardous materials (hydrocarbons, chemical products, etc.);
- Take all precautions during the refuelling of vehicles and machinery, and forbid the refuelling near water bodies;
- Avoid crossing permanent waterways; if necessary, locate the crossing where the banks are stable and the waterway the narrowest;
- Conserve the vegetation along water bodies and near wetlands;
- Plan emergency response measures in case of accidental spill;
- Assess the relevance of clearing the vegetation before flooding the reservoir;
- Avoid areas sensitive to erosion;
- Carry out the construction works in the dry season;
- Limit the circulation of heavy machinery to minimal areas;
- Avoid establishing access roads along steep slopes; instead, locate the access roads perpendicularly or diagonally to the slope;
- Use existing borrow pits rather than creating new ones; after the works, restore borrow pits by stabilizing slopes and facilitating vegetation regeneration;
- Stabilize the soils in order to reduce potential erosion;
- At the end of construction works, level off the soils and facilitate vegetation re-generation;
- Implement integrated watershed management in order to control soil erosion;
- Prevent land clearing in watershed and facilitate the reforestation of cleared areas;
- Design the works in order to release sediments (hydraulic release);
- Dredge accumulated sediments;
- Regulate water flow to minimize soil salinization or concentration of chemical products;
- Design the project by taking into account ecosystems of particular interest and ecologically sensitive areas;
- Protect equal areas of ecosystems of particular interest to offset losses;
- Establish a perimeter of protection around sensitive ecosystems such as wetlands and unique habitats sheltering endangered species;
- Minimize the length of work in ecologically sensitive areas;
- Design the project by taking into account wildlife reproduction areas and migration corridors;
- Do not carry out any work in reproduction areas during the reproduction periods;
- Minimize sedimentation in spawning grounds downstream;
- Relocate animals before flooding the reservoir;
- Control illegal fishing and hunting, particularly by non-resident workers;
- Maintain a minimum water flow for fishes and aquatic life;
- Provide appropriate means of passage for fishes;
- Facilitate the development of culture fisheries in reservoir as a mean of compensation;
- Before construction, carry out an archaeological search in the potential areas containing artefacts and preserve discovered artefacts;
- Negotiate with traditional authorities the preservation of important cultural, religious, historical and aesthetic sites and resources and agree on potential compensation for the communities;
- During construction, ensure an archaeological surveillance in the potential areas containing artefacts and in case of a discovery, advise the concerned authorities;
- Involve traditional authorities in monitoring cultural, religious, historical and aesthetic sites and

- resources during the various phases of the project;
- Provide equivalent or better housing and accompanying facilities to involuntarily displaced men and women in accordance with consultation results;
- Plan adequate settlement areas with appropriate housing and services (water and sanitation) for non-resident workers and their families;
- Provide temporary food supplies to involuntarily displaced men and women, as needed;
- Provide complementary training /support to men and women to facilitate adjustment during the transition period;
- In accordance with priorities of displaced men and women, ensure appropriate funding for resettlement as well as for productive land compensation to men and women owning or occupying/cultivating the land;
- Establish access mechanisms to land in the watershed in order to control unorganized settlements;
- Take into account the various land uses while designing the project in order to minimize the loss of land, particularly productive land;
- Involve traditional authorities in the design of the project, particularly in siting settlements and in defining flooded areas;
- Wherever possible, compensate the loss of land by protecting an equivalent land area in the region;
- Offer compensation or alternative revenue opportunities to men and women losing land and/or productive means, e.g. to owners and those occupying/cultivating the land;
- Develop alternative grazing areas to compensate for those lost;
- Integrate land management priorities into land planning instruments to take into account various land uses;
- Clearly define water rights and establish water user fees in consultation with concerned stakeholders;
- Build on the respective knowledge and experience of women and men in water management;
- Etc.

Environmental Hazard Management

This chapter shall describe the security measures and propose a preliminary contingency plan for the construction and operation phases of the project (possible contingency situations, major actions to properly react to accidents, responsibilities and means of communications).

The ESIA shall include an analysis of the technological accident risk: identification of hazard and potential consequences, estimation of the consequences' magnitude and frequency, and risk estimation and evaluation.

The main risks of the project are related to:

- Health impacts (Vector-borne and other communicable diseases, HIV and sexually transmitted infections Injuries and Malnutrition). Activities associated with construction works such as the manipulation of fuel, waste and hazardous materials;
- Flooding and management of the reservoir;
- Changes in land and water uses, access and rights, that can lead to social conflicts;
- Social conflicts associated with the venue of migrant workers and new settlers (divorces, ethnic tension, etc.);
- Dam rupture, causing sudden flooding of the downstream area and resulting in the loss of human lives and serious economic damages. This aspect will be analysed by the feasibility study including factoring of Climate Change influence on patterns of floods. The ESIA will summarize the main findings of the dam rupture analysis.
- Etc.

In order to prevent or minimize these hazards, appropriate risk management measures shall be designed and implemented.

Environmental and Social Monitoring Plan (ESMP)

The first section of this chapter shall describe the surveillance measures aiming at ensuring that the proposed mitigation and enhancement measures are effectively implemented. The second section concerns the environmental and social monitoring activities designed to measure and evaluate the project impacts on some key environmental and social components of concern and to implement remedial measures, if necessary. Indicators, roles and responsibilities shall be clearly defined. The cost of the program shall be estimated, including the cost for environmental and social capacity building if necessary.

Public Consultations

This chapter shall summarize the actions undertaken to consult the groups affected by the project, as well as other concerned key stakeholders including Civil Society Organizations. The Consultant should establish a consultation mechanism with local administrative authorities and traditional authorities to ensure that their views are considered during the planning and implementation phases. Men and women should have the opportunity to organise themselves in groups representing their collective interests. The detailed record of the consultation meetings shall be presented in annex to the ESIA Report.

Conclusion

The Conclusion shall specify the environmental and social acceptability of the project, taking into account the impacts and measures identified during the assessment process. It shall also identify any other condition or external requirement for ensuring the success of the project.

Annexes

List of the professionals and organizations having contributed to the preparation of the ESIA Report;

- List of consulted documents, including project-related reports;
- Baseline data referred to in the Report;
- Record of consultation meetings with primary and secondary stakeholders;
- The specific studies prepared in the framework of the ESIA;
- Any other document that the Consultant considers useful for substantiating the ESIA study results.

Annex 5: AWF's communication and visibility guidelines



African Water Facility
Facilité africaine de l'eau

Mobilising Resources for Water in Africa
Mobiliser des ressources pour l'eau en Afrique



AFRICAN WATER FACILITY

COMMUNICATION AND VISIBILITY GUIDELINES

Adopted by the Governing Council 27 November 2013



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COMMUNICATION AND VISIBILITY GUIDELINES

Communication and brand visibility greatly matter to the AWF. The AWF views communication as a strategic function firmly tied to its strategies and business objectives. Steady communication with AWF stakeholders helps build credibility and secure their trust and esteem, which in turn, helps AWF build and protect its reputation. Communications is also about disclosure. The AWF is a multi-donor fund, and is accountable to a Governing Council that expects the AWF to hold itself to the highest level of accountability and transparency. The AWF is committed to making every effort to disclose, share and report information useful and relevant to its stakeholders and the greater public. This entails effectively communicating its achievements, progress, and results by using all means available, in a timely manner. All these elements are important for business and essential to attract and retain donors, and for AWF to maintaining its social license to operate.

Brand awareness is about making sure the public knows AWF exists and can tell the AWF apart from other water funds or organisations. The brand is a visual, memorable trigger, or a logo, that embodies the AWF and captures its core identity. Brand awareness is achieved over time, through activities meant to increase brand visibility, by repeated use and exposure of the logo at strategic places and times. The AWF logo is used as a seal or a signature used to signal AWF financial support or special collaboration.

*The AWF has established **Communication and Visibility Guidelines** to the attention of partners, AfDB regional offices and grant recipients to help AWF more effectively achieve its brand and communications objectives, as laid out in the AWF Long Term Communications Strategy 2006 approved by the AWF Governing Council in 2006.*

1. GENERAL REQUIREMENTS

- 1.1 At an early stage, when preparing communication activities related to an AWF supported event or project, contact the Communication Officer at AWF Secretariat, copying the AWF Project Manager.
- 1.2 At a minimum, and wherever possible, the AWF logo should be applied to outreach materials that pertain to AWF supported projects or events. The proper use of the logo should be discussed with the AWF Communication Officer.
- 1.3 The AWF should be verbally mentioned as donor of the project it is funding at public speaking events where the project is discussed, and also be mentioned as donor in any Power Point presentations relevant to the project funded by the AWF, using the name and the logo of the AWF appropriately.
- 1.4 The logo is to be obtained upon request from the AWF Communication Officer.
- 1.5 Documents and publications related to an AWF supported project or sponsored publication should contain the AWF logo, as well as this phrase on the cover page: “*This project/program/study is funded by the African Water Facility*”.
- 1.6 Implementing and executing agencies should always have a link to the AWF website on the page of their website relevant to an AWF-funded project/activity. The website is: www.africanwaterfacility.org
- 1.7 The AWF asks that grant recipients report back to the AWF Secretariat, any special mention, award nominations or recognition that the project may have received.

2. VALIDATION PROCESS

- 1.8 The AWF management is responsible for the final clearance of AWF communications products/outputs.

2 PRESS RELEASES & MEDIA ADVISORIES

- 2.1 The AWF will issue an AWF-branded press release every time a project is approved and/or signed, and when completed (handover).
- 2.2 AWF press releases must always include a quote from the Coordinator of the AWF, which must be cleared by the Coordinator.
- 2.3 The AWF encourages and appreciates initiatives to issue joint press releases with its grant recipients. A standard joint press release can be issued at any time agreed with the AWF (between launch and completion).
- 2.4 When the grant recipient wishes to produce a press release, liaising with the AWF Communication Officer is required, as well as receiving a quote from the AWF Coordinator, as appropriate, and getting approval and clearance.
- 2.5 The AWF should be included in the title and/or first paragraph of the press release, as appropriate.
- 2.6 The press release should incorporate the AWF logo, mention that funding was provided by the AWF, and mention the amount of the AWF funding.
- 2.7 If a press conference is planned, the press release should include the name of an AWF senior representative who will be present at the press conference, when relevant.
- 2.8 All press releases must bear the name and contact information of the AWF Communication Officer, and if possible that of the communication/media representative from the grant recipient.
- 2.9 The AWF boilerplate text (“About the AWF”) must be added to the text, including the AWF web site address. Please contact the AWF Communication Officer for the latest version.
- 2.10 The AWF has final validation of all its press releases, following a review process involving reviewers.
- 2.11 The rules above also apply to media advisories.

3 PRESS CONFERENCES

- 3.1 Press conferences to launch projects funded by the AWF should be organized in cooperation with the AWF, as much as possible.
- 3.2 The invitations should bear an AWF logo.
- 3.3 The AWF logo of a visible size should appear on any banner or poster to be displayed at the site of the conference.
- 3.4 Press kits need to include a press release with the AWF logo.

3.5 Whenever possible, an AWF banner should be on hand and set up to serve as a backdrop for TV and photo purposes.

4 PRESS VISITS

4.1 When appropriate, journalists should be invited to visit the project funded by AWF, accompanied by representatives of the AWF or the AWF Focal Point in the respective authority / government of the grant recipient.

5 VISITS BY GOVERNMENT OFFICIALS, AWF DONORS

5.1 Visits to projects by government officials and AWF donors are encouraged. Those should be prepared in coordination with the AWF and the AWF Focal Points of the host government. This can include meetings with local beneficiaries.

5.2 These visits may also include government officials and AWF donors' participation to round tables and other events, as relevant.

6 LEAFLETS, BROCHURES AND NEWSLETTERS

6.1 All leaflets and brochures relevant to the project/program financed by AWF should incorporate the basic elements of the AWF visual identity, i.e. the AWF logo -with or without tagline.

6.2 Leaflets and brochures produced by a grant recipient must also incorporate a definition of the AWF (boilerplate text).

6.3 The cover page of all documents pertaining to the project financed by the AWF must clearly identify the activity as being part of an AWF-funded activity.

6.4 Copies, including electronic copies of the publications, should be made available to the AWF.

7 ELECTRONIC COMMUNICATION

7.1 Electronic communication disseminating information on AWF-funded projects including websites, newsletter, and social media platforms, should link to the AWF website.

8 SIGNAGE

8.1 The grant recipient should produce display panels, posters or banners to promote their AWF-funded or AWF-related activities at exhibitions and other events, placed in strategic locations for all to see.

9 VEHICLES, SUPPLIES AND EQUIPMENT

9.1 AWF generally requests that vehicles, supplies and equipment funded by AWF be clearly identified, and visibly carry the AWF logo and the phrase "Provided with the support of the African Water Facility" in English, French or Portuguese, as relevant.

- 9.2 This requirement is subject to negotiation between AWF and the grant recipient as some supplies and equipment may be exempt.
- 9.3 The grant recipient must provide evidence of compliance with this rule (digital photos sent by email are recommended.)

10 PHOTOGRAPHS AND AUDIOVISUAL PRODUCTIONS

- 10.1 Professional high resolutions (300 Dpi) digital photographs of the project funded by AWF should be supplied to the AWF throughout the different phases of the project, to document the progress of actions and events related to these, and to be used in print and online publications.
- 10.2 All photos should be submitted with full caption and credit information.
- 10.3 The AWF will be entitled to use or reproduce photos submitted to it without payment of royalties.
- 10.4 Whenever relevant, audiovisual materials should acknowledge AWF support, by featuring the AWF logo at the beginning and/or end of the movie/documentary.
- 10.5 Copies of the movie(s) / documentary (ies) should be supplied to the AWF.

11 COMMEMORATIVE PLAQUES OR SIGNAGE

- 11.1 Whenever relevant, the grant recipient should place a permanent plaque, or some other type of large, commemorative signage on the most visible part of the building, infrastructure or nearby the project site, which received funding by AWF, beside the name of the implementing agency and/or name of the project, for visitors to see.
- 11.2 When appropriate, the plaque or signage could contain the following sentence: “This [name of the infrastructure] was funded by the African Water Facility” alongside the AWF logo.

12 PROMOTIONAL ITEMS

- 12.1 Before taking any decision on the production of such items, the Communication Officer at the AWF should be consulted.
- 12.2 Promotional items bearing the AWF logo can be distributed to support communications activities related to the project funded by AWF. This may include T-shirts, caps, pens, notebooks, USB keys etc.

Annex 6: Map showing the project location



Annex 7: Detailed Procurement Arrangements

1. National Procedures and Regulations - Use of Country Procurement System

Public procurement in Tanzania is regulated by the Public Procurement Regulatory Authority (PPRA) which is a regulatory body established under the Public Procurement Act CAP 410 as repealed by the Public Procurement Act No.7 of 2011. The Authority is charged with regulatory functions and vested with oversight powers and responsibilities on all public procurement activities carried by all public bodies in the mainland Tanzania. The Tanzanian procurement system provides for use of standard bidding documents for procurement of goods and works by any procuring entity. The Authority has prepared Standard Request for Proposal (SRFP) for Selection and Employment of Consultants to be used by the Procuring Entities. These SRFPs have been categorized in accordance with the different contracts used for consultancy assignments. As the project relates to the recruitment of consulting services, there is therefore no scope for use of national procurement procedures in the current project. Hence, the procurement of consulting services will be in accordance with Bank Rules and Procedures for the Use of Consultants, dated May 2008, revised July 2012 using the relevant Standard Bank Document, and the provisions stipulated in the Financing Agreement.

2. Procurement Arrangements

Procurement under the Feasibility Study will be limited to the engagement of consultants. As per discussion which took place during the appraisal and agreement reached between AWF and CRIDF, acquisition of consulting services financed by the Bank (AWF) will be in accordance with Bank's Rules "Rules and Procedures for the Use of Consultants dated May 2008 (revised July 2012), as amended from time to time, using the relevant Bank standard request for proposal (RFP) documents, and the provisions stipulated in the Financing Agreement. CRIDF having with a pool of consultants, will provide the experts themselves otherwise will engage experts required for the Feasibility Study components of which it will finance by following its own procurement rules. CRIDF is willing to finance studies and technical assistance relating to Climate Resilience Assessment, International Notification Process and Financing Plan for Implementation as component 2 of the study. The co-financing arrangement with CRIDF will therefore be on parallel financing basis. Procurement of goods and services financed by the Government shall be done using Government Procedures.

The procurement arrangements are detailed below.

Table 1: Summary of Procurement Arrangements

No	Package	Cost (000 €)		Procurement Rule	Selection Mode	Pre-qualification (Y/N)	Bank Prior review	Expected bid opening date
		Total	Bank Fund					
Consulting Services								
1	Feasibility Study (PFS)	1,746.75	1,746.75	Bank's	QCBS	N	Y	April/May/2016
2	Strategic Social and Environmental Assessment (SSEA)	239.45	239.45	Bank's	QCBS	N	Y	April/May/2016
3	Other Studies and Technical Assistance (Climate Change Resilience Assessment,	263.20		CRIDF	CRIDF	CRIDF	CRIDF	April/May/2016

	International Notification Process, Financing Plan for Implementation)							
4	Project/Study Management	213.00		Recipient				

The recipient has expressed desire to apply for advanced contracting procedures to facilitate the selection of consulting services related to the pre-feasibility studies, to avoid start up delays in the project.

2.1 Consulting Services

- Acquisition of consultancy services related to Feasibility Study (PFS) and Strategic Social and Environmental Assessment (SSEA), shall be done through shortlisting of firms, using Quality and Cost Based Selection (QCBS).
- When the amount of the contract is less than UA 200,000, the Borrower may limit the publication of a Specific Procurement Notice (SPN) requesting for expressions of interest to national or regional newspapers. However, any eligible consultant, being regional or not, may express his desire to be short-listed. For contract valued at more than UA 200,000, advertisement of the procurement must be placed on the UNDB online and the Bank’s website.

3. Assessment of the Executing Agency

TANESCO will be the implementing/executing agency and will carry out day-to-day studies coordination activities including procurement, financial management. The Ministry of Energy and Minerals and the Ministry of Agriculture will provide project oversight.

An assessment of the capacity of the Executing Agency (TANESCO) to implement procurement actions for the project/studies has been carried out by the Bank. The objectives of the assessment were to (a) evaluate the capability of the implementing agency and the adequacy of procurement and related systems in place; (b) assess the institutional and procedural risks that may negatively affect the ability of the agency to carry out the procurement process; (c) identify risks, develop and incorporate mitigation measures to address the identified deficiencies to minimize the identified risks.

The resources, capacity, expertise and experience of TANESCO have been reviewed and are determined to be generally adequate. TANESCO will assign as soon as possible experienced procurement officer to the Study Coordination Unit (SCU) to be part of key SCU professional staff that will be drawn from both TANESCO and NIC. Further, the TANESCO’s Procurement Management Unit will assist the both SCU team in handling the procurement processes. A Joint Tender Evaluation Committee composed of sufficient technical staff designated by each of the study owners will participate in proposal evaluation for the selection of studies consulting firms. The Study Coordination Unit (SCU) will be responsible for obtaining any necessary clearance on all procurement matters.

4. Risk Mitigation Measures:

The capacity and risk assessment of the Executing Agency has been done and is rated as high. This rating takes into account that the recipients (TANESCO and NIC) have previous experience in handling AfDB financed projects. The increased workload resulting from this project will require technical support to complement the Executing Agency capabilities to mitigate against implementation risks. This will be done through the engagement of Individual Consultants as indicated in para 2.1 above, as well as the nomination of a qualified individual to be dedicated for procurement activities. In addition, launching mission and regular supervision missions will include training sessions related to procurement activities. Once all the planned

measures are addressed, the risk assessment is expected to reduce to Low. The detailed assessment and mitigation measures are in the Procurement Risks and Mitigation Table below.

Table 2: Procurement Risks and Mitigation Table

	Issue	Risk Mitigation/Corrective Measure	Responsible	When
1	Delays in procurement processing, due to limited experience and knowledge of Bank Rules & procedures	- Designation/Nomination of an experienced Procurement Specialist within the SCU to carry out procurement activities under the project - Training Sessions and clinics	TANESCO AfDB	Three months within financing agreement effectiveness From Project Launching and throughout the project implementation period
2	Ambiguous or unclear procedures and roles during project implementation	Development of an implementation manual	TANESCO	Six months within Project effectiveness

The Project Implementation Manual will include, in addition to the procurement procedures, the SBDs to be used for each procurement method, as well as model contracts for works and goods procured if any.

5. General Procurement Notice (GPN)

The GPN text will be discussed and agreed with the Executing Agency (TANESCO) at negotiations and upon approval of the Financing by the Bank Group's Board of Directors of AWF Committee and it will be issued for publication² in UNDB online and in the Bank's Internet Website, upon approval by the Board of Directors or the AWF Committee of the Financing Proposal.

6. Procurement Plan

The recipient, at appraisal, developed a Procurement Plan for project implementation which provides the basis for the procurement methods. This plan has been agreed between the recipient and the Project Team and is available at TANESCO. It will also be available in the Project's database and in the Bank's external website. This Procurement Plan will be updated by the recipient SCU annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. Any revisions proposed to the Procurement Plan shall be submitted to the Bank prior no objection. The recipient shall implement the Procurement Plan in the manner in which it has been agreed with the Bank.

7. Review Procedures:

² The General Procurement Notice is prepared by the Recipient and submitted to the Bank, which will arrange for its publication in the United Nations Development Business (UNDB online) and in Bank's Internet Website.

All the acquisitions under this study are subject to prior review. The following documents are subject to review and approval by the Bank before promulgation:

- General Procurement Notice,
- Specific Procurement Notices,
- Requests for Proposals from Consultants,
- Proposals Evaluation Reports (Technical),
- Draft contracts, if these have been amended and differ from the drafts included in the Requests for Proposals,
- Reports on combined Evaluation of Consultants' Technical and Financial Proposals, including recommendations for Contract Award,
- Minutes of negotiations and duly initialled contracts documents.

8. Review Thresholds

Procurement decisions subject to Prior Review under this project will be made in line with the following thresholds:

Table 3: Prior Review and Procurement Method Thresholds – Tanzania

Expenditure category	Contract value threshold (UA)	Procurement method	Contracts subject to prior review
Consulting Firms	≥ 200,000	QCBS	All
	<200,000	CQS, LCS, Single Source	All

Notes (i) Short list comprising entirely of national consultants: Short list of consultants for services, estimated to cost less than **UA 200,000** equivalent per contract, may comprise entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Bank Rules and Procedures for the Use of Consultants

(ii) Contracts selected on basis of CQS should not exceed UA 200,000 equivalent

(iii) Terms of Reference (TORs) for all consultancy contracts as well as all single source selections irrespective of value will be subject to prior review

Any Other Special Selection Arrangements: Prior review shall be required for packages to be procured using advance selection procedures.

9. Frequency of Procurement Post Review Mission

Due to the risks identified, the Project will require close supervision to ensure that the identified fiduciary safeguards are effective. Further, in addition to the prior review, supervision missions, bi-annual procurement post review missions will be conducted by the Bank Group. However, the Bank Group reserves the right to conduct its procurement audit at any time during the project study implementation. The Executing Agency will maintain all relevant procurement records in accordance with Bank requirements for all procurements subject to post review. Information on procurement processing will be collected by the Executing Agency quarterly and shall be included in detail in the Project Quarterly Progress Report to be submitted to the Bank.

Annex 9: Financial Management Assessment Report

Abbreviations

AWF	African Water Facility
Bank	African Development Bank Group
CAG	Controller and Auditor General
CFO	Chief Finance Officer
CFRA	Country Fiduciary Risk Assessment
DFID	Department for International Development (UK)
DPs	Development Partners
FM	Financial Management
IAG	Internal Auditor General
IFMIS	Integrated Financial Management Information Systems
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IFRS	International Financial Reporting Standards
MoF	Ministry of Finance
NAO	National Audit Office
PEFA	Public Expenditure and Financial Accountability
PFM	Public Financial Management
PPRA	Public Procurement Regulatory Authority
ROSC	Report on the Observance of Standards and Codes
TANESCO	Tanzania Electric Supply Company Limited
TZS	Tanzania Shilling
UA	Unit of Account

Financial Management and Disbursement Arrangements

Executive Summary

The Bank has conducted an assessment of the adequacy of the financial management system of the Executing Agency based on Bank's FM Implementation Guidelines-2014. The assessment concluded that the overall risk is "**Moderate**". The Proposed mitigation measures as per the risk table, Annex 1, when implemented will enhance the Project ability to (1) use the funds for the intended purposes in an efficient and economical way, (2) prepare accurate, reliable and timely periodic financial reports, and (3) safeguard the entities' assets.

In line with the Paris Declaration on Aid Effectiveness and Accra Agenda for Action, the project will substantially make use of the Country's financial management systems. The overall responsibility of financial management (including Budgeting, Accounting system, Internal Control, Treasury Management/Funds Flow, Financial Reporting and External Audit arrangements) rests with the Study Coordination Unit (SCU) composed of officers from TANESCO and National Irrigation Commission (NIC). The Project Financial Management function will be implemented within the structure of TANESCO with the Chief Finance Officer

(CFO) being responsible. A Project accountant with knowledge and experience acceptable to the Bank will be assigned to carry out the finance function of the Project, but will be supervised by the CFO or their delegate.

The Internal Audit Departments will include the project in the internal audit program and audit the project financial transactions regularly. The internal audit reports will be shared with the Bank during supervision missions.

The Executing Agency will produce quarterly progress reports, including all sources of financing and Study expenditures (within 45 days after the end of each quarter). As required by African Water Facility (AWF) Operation Procedures, the Project financial statements will be audited by an independent audit firm appointed by AWF in accordance to the audit Terms of Reference approved by the Bank. The Project audit report, Complete with a management letter (with management responses), is expected to be presented to the Bank, within three (3) months of the study closure. The costs of such audits shall be borne by the AWF and shall not be part of the Grant.

The Project will mainly use the Direct Payment method to pay contractors/consultants/suppliers. The Bank's four disbursement methods are available to be used during project implementation. The Bank will issue a disbursement letter, which will provide specific guidelines on key disbursement procedures and practices. The content of the disbursement letter will be discussed during negotiations.

Summary Project Description

The total estimated cost of the project/pre-feasibility studies and SSEA studies is estimated at € 2,462,399 with AWF contributing € 1,986,198 (80.7%), CRIDF € 263,200 (10.7%) and the United Republic of Tanzania € 213,000 (8.6%). The Project has four components, namely, the Feasibility study, technical assistance, strategic social and environmental assessment (SSEA), and the study coordination and management.

Use of Country PFM System

Various diagnostic work has been carried out in Tanzania which include the Report on the Observance of Standards and Codes (ROSC) 2005, Public Expenditure and Financial Accountability (PEFA) 2008 and 2013, Country Fiduciary Risk Assessment (CFRA) 2011 conducted jointly with DFID and the Bank, and CFRA 2014 (updated 2015) conducted by the Bank. The Project will substantially make use of the Country's financial management systems which include the following: i) the day to day management will be as per the rules and procedures as stipulated in TANESCO Financial procedures. The Chief Finance Officer (CFO) of TANESCO will be responsible for the Financial Management function of the project. ii) The Internal Audit Department will include the Project in its audit program and audit it in line with government systems. The Project external audit will be conducted by a Private Audit firms appointed by African Water Facility (AWF), but this does not prevent the Controller and auditor General (CAG) from conducting the audit and sharing the audit report with the Bank. Owing to weaknesses noted in the CFRA 2014 (updated 2015) especially the Integrated Financial Management Information Systems (IFMIS) which is not flexible to accommodate project activities, concern over significant expenditure arrears accruing (large construction contracts entered into outside the commitment control system and some Public Enterprises) and counterpart funds which delay some Projects, the Project will use a hybrid system in Accounting and Treasury Management which include the following measures:

- i) The Bank will insist on use of suitable computerized accounting system for the Project and may provide resources for purchasing such system (where the systems are not flexible to accommodate the budget and activities of the Project to the component/category level).
- ii) The audited Financial statements and management letter will be submitted to the Bank within six months after the end of the financial year as the government procedures take more than nine months to be made Public or released and more specific for this project after midterm and closure of Project

- iii) For Treasury Management the Bank will continue to use the Direct Method of disbursement and use of special accounts and other Bank methods as the country continues to reform this area to move to the single treasury account and tackle problems of commitment controls with regards to significant expenditure arrears, counterpart contributions and systems deficiencies.
- iv) The Project will use the country budget system, but will have additional requirement for preparation of work plan to reflect the component/categories levels.

Executing Entities

Tanzania Electric Supply Company Limited (TANESCO), a Public Company established under CAP 2012 of the Company Act under the Ministry of Energy and Mineral will be the executing entity of this Project. The Managing Director is the overall accounting officer of TANESCO reporting to the Board of Directors. A Study Coordination Unit (SCU) composed of officers from TANESCO and National Irrigation Commission (NIC) will be established to manage the study. The Project Financial Management function will be implemented within the structure of TANESCO with the Chief Finance Officer (CFO) being responsible. A Project accountant with knowledge and experience acceptable to the Bank will be assigned to carry out the finance function of the Project, but will be supervised by the CFO or her delegate.

Summary of Assessed Financial Management Arrangements

The financial management assessment was done in accordance with the Bank's FM Implementation Guidelines-2014. The FM assessment concluded that the overall residual risk is "Moderate". The Proposed mitigation measures as per the risk table, Annex 1, when implemented will enhance the Project ability to (1) use the funds for the intended purposes in an efficient and economical way, (2) prepare accurate, reliable and timely periodic financial reports, and (3) safeguard the entities' assets.

Budgeting

TANESCO has well documented planning and budgeting procedures to guide the budget process for all significant activities of the authority. Budgets are prepared for all significant activities in sufficient details, actual expenditure compared to budget and explanations requires for significant variation. The Chief Finance Officer (CFO) is responsible for the budget process. The user departments identify activities/projects to be implemented and provide the budget for consolidation by the CFO. The approval process involves consultation with user departments, workers' council and management before the approval by the Board of Directors. The approved budget is then uploaded into the accounting system ISCALA. The budgetary control system is done on a monthly basis by the finance department who allocate funds based on set budgets. However, it was noted that ISCALA is not able to capture project activities at category and components levels. A study for appropriate Integrated Financial Management Information System (IFMIS) has been conducted with both TANESCO and the Government still soliciting funds to purchase a new system. The Project Management will prepare annual Project work plan/budget and Procurement plan for implementing project activities taking into account the specific project components and categories. These plans and budgets will be submitted to the Ministry of Finance for approval and thereafter to the Bank for No objection.

Accounting System

i) Accounting Policies and Procedures and information systems

TANESCO uses double entry accounting system based on International Financial Reporting Standards (IFRS) which is adequate. The Project accounting transactions will be guided by the TANESCO's financial policies and procedures last updated in 2013. The Project will use ISCALA for maintaining the accounts and will be supplemented by excel spread sheet given that ISCALA cannot capture Projects activities at component and category level. However, should TANESCO upgrade or acquire IFMIS, then we would recommend using the computerized accounting system fully. The Financial Management function of the Project will be under the responsibility of the CFO. The Project's financial management will be led by a competent Accountant acceptable to the Bank who will be supervised by the CFO or her delegate.

ii) Staffing

TANESCO has adequate number of accounting staff (more than 60 in number including the CFO). The staff assist with the normal activities of TANESCO which includes authorization and approval needed for the institution financial transactions and are well qualified and experienced (with several staff having Masters in Business Administration, CPA and other relevant accounting professions). TANESCO Staff have experience in managing Bank financed project and other DPs financed Projects including the World Bank, European Union, JICA, DFID and AFD. The Project Accountant (discussed under Accounting System above) will coordinate the processes into TANESCO systems and ensure that (i) Project business plan is robust (ii) annual budgets are derived from the project business plan (iii) the budget has been included into the Government budget with appropriate budget codes (v) no delay is occurring in the payment process. The Bank will provide training during the technical launch of Project to ensure a good understanding of the Bank's financial management and disbursement procedures.).

Internal Control, Fraud and Corruption

i) Internal Control environment, information and communication, and Control activities

TANESCO has adequate internal control environment, information and communication, and control activities. TANESCO has a recruitment policy which provides equal opportunity, terms of reference for each position, code of ethics which cover fraud and corruption and assign responsibilities in accordance to qualification and experience. In addition, the adequacy of information and communication system is demonstrated by policies and procedures which guides authorization, alteration of established policies, personnel informed about entity activities. There is segregation of duties in terms of authorization to execute a transaction, recording of the transactions and custody of assets involved in the transaction. There is system security through enhanced password restriction of system access rights and budgetary controls. The notable weakness has been the use of manual system for Projects attributed to the ISCALA system not being able to capture project activities at component/category level. The Project will mitigate the problem by reconciling the statement of confirmed disbursement provide by the Bank on monthly basis with the excel spread sheet records to ensure all the data/information has been captured.

ii) Risk Assessment and Internal Audit

TANESCO has a written risk policy which concretely state how the risks of the Organization will be managed. TANESCO has an Internal Audit Department headed by the Chief Internal Auditor who reports administratively to the Managing Director and functionally to the Audit Committee. The Department is well staff with mixed skills which include qualified accountants (10), Procurement/Material Management Specialists (8), System Auditors (6) and Engineers (8). The audit is carried out using the risk based approach. The Department has been providing quarterly reports which have been taken into consideration by the Management and Audit committee. The Internal Audit department will play an important role of reviewing and evaluating the internal control system of the project regularly and produce internal audit report for management use. The internal audit report will be shared with the Bank as needed.

Treasury Management (including funds flow and disbursement)

i) Cash and Bank

TANESCO has adequate banking arrangements and controls as prescribed in the Institution's Financial policies and procures 2013 which includes reconciliation of bank accounts, authorized signatories and has experience in managing Bank financed Projects. TANESCO does not operate a single treasury account system, but maintains several Bank accounts at the Bank of Tanzania and some commercial Bank. TANESCO has systems in place to ensure timely payments to suppliers. However, this is some sometimes affected by untimely disbursement of counterpart funds and leading to slows implementation of the Project.

The Government is committed to the provision of counterpart funds which is not very significant under this project.

ii) Disbursement Arrangements

The Project will mainly use the Direct Payment method to pay consultants/suppliers. Other disbursement methods can be used where the need arises after consultation with Bank and obtaining prior approval.

Financial Reporting

TANESCO has adequate financial reporting system which follows International Financial Reporting Standards (IFRS) and will apply to the Project. The company also produces regularly quarterly management reports (which include financial) and annual reports. However, the current situation where project reports are prepared outside the main accounting system using excel spread sheet may not facilitate timely and quality financial reporting. This will be mitigated by having a project accountant and the Bank providing monthly reports on the disbursement status. The Executing Agency will produce quarterly progress reports, including all sources of financing and Study expenditures (within 45 days after the end of each quarter). As required by the AWF Operational Procedures, the Project will prepare **Special Purpose Project Financial Statements**, in form and substance acceptable to the Bank at, (i) at the mid-term (ii) and after the closing of the Study.

These Special Purpose Financial Statements will comprise of:

1. A Receipt and payment summary;
2. A detailed statement of expenditures classified by Project Components and or Disbursement Category, showing comparisons with budgets for the reporting quarter and cumulatively for the project life to date;
3. A cash flow forecast;
4. Explanatory notes/notes to the accounts capturing significant reasons for deviation from expected targets;
5. A schedule of direct payments made by the Bank.

External Audit

TANESCO's annual financial statements are audited by CAG in accordance to statutory requirements. The review of the TANESCO's audit report for the period ending December 2013 shows that the audit reports were signed by the Board Director in September 2014 (almost 9 nine months after the end of the financial period which is beyond the deadline for submitting audit reports for Bank (AWF) financed Projects). As per the AWF Operation Procedures the Project financial statements will be audited by a Private audit firm appointed by AWF in accordance to the audit Terms of Reference approved by the Bank. The audit report, Complete with a management letter (with management responses), will be presented to the Bank, within six (6) months after the end of midterm and study closure. The costs of such audits shall be borne by the AWF and shall not be part of the Grant.

TANESCO's audit report for the period ending December 2014 was not available owing to implementing Government Directives with required Public entities to align their financial year with the Government fiscal year of July to June of the following year. TANESCO will therefore prepare 18 months' financial statements to June 2015 and thereafter revert to the 12 months. The external auditors report for December 2013 had unqualified opinion with emphasis of matter. The emphasis is on the net loss of TZS 467,704 million in the financial year which increased the reported loss to 1,450,380 million, an indication of uncertainty on the smooth operation of the company. The Government is committed to improve performance of TANESCO which included getting resources from the World Bank, AfDB and other DPs to clean up the balance sheet of TANESCO. There has been increase in tariff charges which enabled TANESCO pay some its debts from its internally generated revenue. The project managed by TANESCO have been complying with the audit requirements especially electricity. There was a delay with the Backbone Project to submit audit reports (the issue has been addressed with management). The special audit report on the IPTL case relating to corruption allegations involving the release of about USD 124 million, in December 2013, to Pan African Power

Solutions Tanzania Limited (PAP) from an Escrow account opened at the Bank of Tanzania, pending the resolution of a dispute between TANESCO and IPTL was submitted to parliament in November 2014, discussed and Government was requested to take action on the parliamentary recommendations. The Government is continuing to implement the parliament recommendations.

Audit Report	Due Date
Project Audit Report & Management Letter	6 months after midterm and study closure

Financial Management Action Plan

No.	Action	Completion date	Responsibility
1.	Assign a project accountant with qualification and experience acceptable to the Bank	Before Effectiveness	TANESCO
2	Organize a launch workshop to familiarize staff of the executing agencies on the Bank's FM requirements and overall implementation of the Project	During Project Launch	TANESCO (NIC)/Bank
3	Adequate provision of counterpart funds and dedicated staff in the SCU to facilitate timely implementation of Project Activities	Ongoing	TANESCO (NIC)/Bank

Conditions and Financial Covenants

- 1) Assigning a dedicated Project Accountant with qualification and experience acceptable to the Bank
- 2) The recipient of the AWF grant shall commit to maintain the following: (a) financial management system acceptable to the Bank, over the life of the Study; (b) prepare and submit to the Bank Quarterly Progress Report within 45 days after the end of each quarter; and (c) to facilitate and support the conduct of the final Project audit expected to take place within three months of the closure of the Study. Also implementation of audit recommendations within reasonable time.

Supervision Plan

Given the **Moderate** fiduciary risk for the Project, it is necessary to supervise the Program twice a year. The supervision mission will include a Financial Management Specialist at least once, who will look at the overall internal control systems of the Project and the overall functioning of the Program financial management as assessed during appraisal and agreed during negotiations.

Annex 1

Risk Analysis

Risk	Initial Risk Rating	Proposed Risk mitigation measures	Timing for Proposed mitigation measure implementation	Conditionality (Yes/No)
Inherent risk	S			

<p>Country level The updated CFR A 2014 (updated in 2015) shows weaknesses identified in the PEFA 2013 and the Controller and Auditor General (CAG) reports which include non-compliance with financial regulations and procurement procedures, fiscal risk to the budget posed by some Public enterprises which high expenditures arrears and the cash rationing system which makes the planning exercise un predictable as the Ministry of Finance cannot assure availability of resources and expenditure arrears are still existing, but being addressed though it will take time.</p>	S	<p>The Government with the involvement of the DPs (including the Bank) has amended the Public Financial Management Reform Strategy (PFMRPS) IV to include weaknesses identified by the PEFA 2013 and set milestones. The reforms are being financed through the PFMRP IV program. The Bank intends to continue supporting the PFM reforms and creating an enabling environment for business and private investments through the Institutional Support for Good Governance III.</p>	Three years 2016-2019	N
<p>Entity level In the External Audit Report for the period ending December 2013, the auditors raised concern over the uncertainty on the smooth operation of TANESCO after incurring accumulated loss amounting TZS 1,450,380 million.</p>	S	<p>The Government is committed to improve performance of TANESCO which include soliciting resources from the World Bank, AfDB and other DPs to clean up the balance sheet of TANESCO. There has been increase in tariff charges which enabled TANESCO to pay some its debts from its internally generated revenues. The bank financed the reform of the energy sector which includes TANESCO.</p>	Continuous	N
<p>Project level Inability to use funds efficiently and economically for intended purposes</p>	M	Constant oversight by the Bank and auditors	Continuous	N
<p>Control Risk</p>	M			
<p>Budgeting Ineffective budget monitoring tools.</p>	S	<p>In addition to Procurement plan, Project will prepare annual work plans. The quarterly reports will include budget performance</p>	Continuous	N Y
<p>Accounting Use of the excel spread sheets (semi-manual) for accounting may not produce the required financial reports on timely as per Bank financial management guidelines</p>	M	<p>A Project Accountant with Qualification and experience acceptable to the Bank will be assigned to the Project. The Bank will provide monthly/ statements on the status of disbursement to enable Project to reconcile</p>	Before Project Launch	Y

Internal control Internal Audit Department unable to conduct periodic audits with delays in audit findings implementation	M	It was agreed that the Internal audit department will include the project in its audit program, audit regularly and report shared with the Bank as needed	Continuous	N
Treasury Management/ Fund flows Delays in disbursements especially counterpart funding	M	Close follow up by the Project Accountant at all levels and sensitization during project launch workshop.	During Project launch and continuous during implementation.	N
Financial reporting Delays in getting regular reports and the financial information being linked with project physical progress.	M	Close follow up by the Project Accountant at all levels and sensitization during project launch workshop.	During Project launch and continuous during implementation.	N
Auditing Delays in submitting annual audit reports within six months after the end of the fiscal year. Slow implementation of external audit recommendation.	M	The Project will start the procurement process in the first quarter of the first financial year so as to not to delay the external audit process. The Bank will also continue to provide training on the submission of audit reports. The Bank supervision team will include at least once a financial management specialist to look on the financial management aspects and provide appropriate recommendations and follow up.	Project launch and continuous during implementation.	Y
Overall risk	M			

Annex 10: Detailed scope of interventions funded by CRIDF

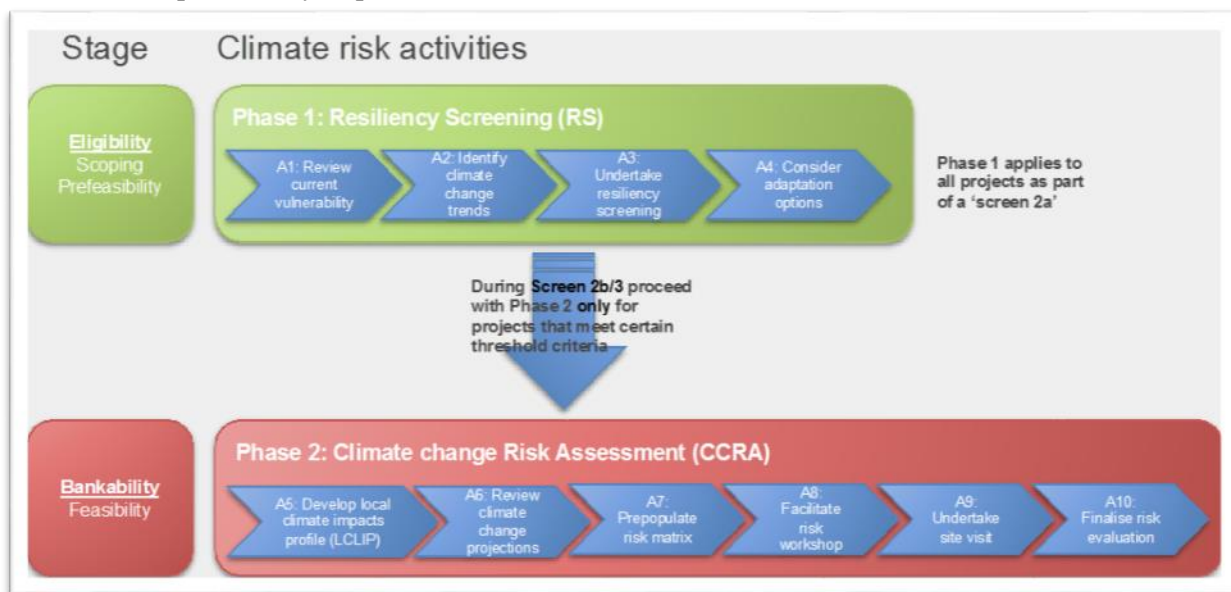
Climate Change Risk Assessment (CCRA)

The CCRA protocol is aimed at mainstreaming climate change in the project and in particular in the design of the infrastructure. It is based on three tools:

- The climate vulnerability tool, which provides a high level analysis of the regions vulnerability to climate change through a set of key indicators.
- The Climate Change Risk Assessment Tool will support the undertaking of the Phase 1 and 2 of the feasibility study. It includes a comprehensive risk matrix.
- A set of projections and accompanying impact statements covering the whole of Southern Africa. They are based on a new technique called self-organising maps, which help reduce uncertainty associated with the range of different models available.

The protocol has two phases, which are shown in the figure below.

- Phase 1: Resiliency screening is comprised of activities 1- 4. These activities form a basic preparatory due diligence and are to be undertaken at concept stage (Phase 1 of the feasibility study).
- Phase 2: Climate Change Risk Assessment is comprised of activities 5-10 and should be undertaken at feasibility/detailed design stage. Phase 2 is detailed and intensive and requires specialised inputs from climate scientists, modellers and climate risk experts, travelling, engagement with stakeholders and on-site presence by a specialist.



Financing Plan for Implementation

This consultancy will help the Government assessing the interest of setting-up a PPP scheme to finance the project or any structuring option well matching the specific features of agro-irrigation projects and hydropower projects respectively. It will also propose a comprehensive financing strategy and a preliminary support to mobilise financing through:

- Assessment of existing PPP legal framework;
- Assess the options for PPP funding for the hydropower generation, the irrigation schemes, the mini-hydro-plant and for the water supply systems to the targeted communities;
- Provide support to the Ministry of Finance in preparing the adequate PPP funding promotion of the project;
- Explore relevance of project financing principles;

- Raise awareness on existing funds linked to environmental aspects including climate change adaptation funds;
- Prepare guidelines for raising funders' interest and approach potential funders in preparation for the organization of the funders' round table for the further phases of additional studies (full Feasibility Study and full ESIA Study) and mobilisation of capital for investments.

International Notification process

The proposed development of a multipurpose dam on the Ruhuhu River, contributing to 20% to the Lake Nyasa inflow may trigger the need for notification to riparian states under existing Protocol or Agreements on Shared Watercourses and the ZAMCOM Agreement.

The multipurpose dam project within the larger Zambesi River Basin provides a useful “testing ground” for using the notification process as a means to build lasting cooperation in the face of climate change. This task will therefore aim to develop a set of training materials as well as advice for the Government of Tanzania on whether and how the notification process could proceed, as well as options for the potentially affected countries (Malawi and Mozambique) to avoid, minimise and mitigate any potential impacts.

Specifically, through a review of international agreements CRIDF will advise on the need for notification in respect of the study of the Kikonge multipurpose dam and support the notification process. This will be done in such a manner as to build the capacity of the concerned line ministries in Tanzania in terms of the notification process and the implementation of transboundary basin/river agreements.