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**MINISTRY OF WATER**



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## **Proposed Protection of Simiyu and Duma River Banks in Bariadi District, Simiyu Region**

# **Comprehensive Project Brief**

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## Abbreviations and Acronyms

BA	Bachelor of Arts
BDC	Bariadi District Council
BSc	Bachelor of Science
CMIC	Co-Management Intervention Committee
CO <sub>2</sub>	Carbon dioxide
dBA	Decibels
DCDO	District Community Development Officer
DED	District Executive Director
DEMO	District Environmental Management Officer
DFO	District Forestry Officer
DFPO	District Focal Point Officer
DLFC	District LVEMPII Facilitation Team
DPLO	District Planning Officer
EAC	East African Community
EIA	Environmental Impact Assessment
EIC	Education, Information and Communication
EMP	Environmental Monitoring Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
IWRM	Integrated Water Resources Management
ILO	International Labour Organization
LGA	Local Government Authority
LVEMPII	Lake Victoria Environmental Management Project II
MSc	Master of Science
NEMC	National Environment Management Council
NO <sub>x</sub>	Nitrogen Oxides
O & OD	Opportunities and Obstacles to Development
OSHA	Occupational Safety and Health Authority
PPEs	Personal Protective Equipments
SO <sub>x</sub>	Sulphur Oxides
STC	Standard Test Conditions
STDs	Sexually Transmitted Diseases
TBS	Tanzania Bureau of Standards
TZS	Tanzania Shillings
WDCs	Ward Development Committees
WEO	Ward Executive Officer
WHO	World Health Organization
WUAs	Water Users Associations

# Chapter One

## Project Background

### 1.1 Introduction

The Lake Victoria Environmental Management Project (LVEMP-II) is a regional initiative implemented by the five East African Community (EAC) partner states of Tanzania, Kenya, Uganda, Rwanda and Burundi. The project is based on the lessons learnt from LVEMP I, which was implemented during 1997- 2005 period and proposed a second phased to address some of the key issues that were identified in the phase one. In addition, LVEMP II aims to implement priority interventions of the Strategic Action Programme (SAP), which address key environmental issue identified in the Trans-boundary Diagnostic Analysis (TDA) for the Lake Victoria Basin (LVB). In Tanzania, the project became effective on the 20<sup>th</sup> August, 2009, and its implementation covers Lake Victoria basin.

LVEMP II in partnership with Bariadi District Council (BDC) plans to implement a project on the protection of Simiyu and Duma River Banks in 45 villages of Bariadi District. The project will be implemented through a proposed co - management natural resources conservation interventions which is an initiative of LVEMP II.

The Simiyu River catchment covers an area of about 11,000 Km<sup>2</sup> to the outfall into the Lake Victoria and is located between 33° 50' – 35° 00' E and 2° 40' – 3° 30' S. The Simiyu and Duma river catchment is of social and economic importance to the population living within. The Simiyu River drains from the Serengeti National Park plains to the Lake Victoria. On the downstream, Duma River joins Simiyu River and form a main tributary. The Duma River is a result of the confluence of Ngasamo and Bariadi rivers on the upstream. This catchment provides a wide range of opportunities to the surrounding communities but if there are no strategic plans for sustainable use of the forest, water and land resources, the catchment will be susceptible to destruction. Both Simiyu and Duma rivers traverse through Bariadi district and pour their water into Lake Victoria.

This project responds to the current threats facing the Simiyu and Duma river sub-catchments. The identified threats include; excessive gully formations; deteriorating water quality due to human activities, deforestation, infestation of water hyacinths in some water reservoirs making some dams un useful, inadequate community involvement and absence of community institutions to manage the water resources. Bariadi district reiterates this need by taking positive measures to conserve and protect the deteriorating Simiyu and Duma sub-catchments by involving efforts from various departments and stakeholders in Bariadi district.

This project has been designed in order to contribute to the overall objective of Component 3 of LVEMP II: Watershed Management particularly to reduce environmental stress in selected degraded sub-catchments and to improve the

livelihoods of communities who depend on the natural resources of Simiyu catchment and Lake Victoria as a whole. The main objective of the project is to ensure sustainable use of water and forest resources and management of Simiyu and Duma sub-catchments. The project will sensitize and build the capacity of community along the catchments to participate in the conservation programs. The project will formulate and train four Water User Associations (WUAs) which will assist the project to lead the water governance and management. The project will rehabilitate identified gullies, mark the river boundaries and mobilize communities to use the conserved areas for livelihood improvement. It is expected that the project will cause minor negative and significantly positive environmental and socio-economic impacts emanating during implementation of project activities.

Projects of this nature are not specifically mentioned in the First Schedule of the Tanzania EIA and Audit Regulations of 2005 as requiring EIA. Nevertheless, in order to comply with the Tanzania Environmental Management Act (EMA), Cap 191 (2004), LVEMPII wishes to ensure that the proposed project is carried out in an environmentally and socially acceptable manner. As such, LVEMP II has engaged a registered EIA expert (Appendix 2) to carry out the ESIA study for this project. The project has been successfully registered with NEMC and the screening decision directed that the proposed project does not exude negative impacts of considerable significance to warrant the need for detailed assessment. Instead, the original Project Brief report has to be made more comprehensive by adding detailed description of project activities and environmental management plan (Appendix 1).

## **1.2 Objectives of the Project Brief**

This project brief was prepared to compile environmental and social considerations into the proposed Simiyu and Duma Rivers protection project design in Bariadi District. The overall objective is therefore to ensure that the project delivers minimum disruption to the environment and social settings. Specifically, the brief intends to:

- ≈ provide adequate description of activities to be undertaken;
- ≈ predict adverse (negative) and/or beneficial (positive) environmental and social impacts associated with the project;
- ≈ propose appropriate mitigation measures and recommend ways in which the proposed mitigation measures could be incorporated into designs;
- ≈ provide cost estimates required to cover the proposed mitigation measures;
- ≈ provide environmental and social management and monitoring plan.

## **1.3 Methodology**

The data and information for compilation of this report were gathered between November 2013 and January 2014. Primarily data and information gaps were identified and strategies were put in place for collecting the information to better compile this report. Generally, the information was collected from a variety of sources including:

- ≈ Review of relevant documents: Policies, guidelines and standards, and legislation etc;

- ≈ Project documents: Concepts, design and schedule of the proposed project; maps at appropriate scale and photographs of the project area;
- ≈ Existing secondary information and data on different environmental, social, economical and cultural characteristics of the area obtainable at relevant offices;
- ≈ Consultation with project administrators and experts; project planning teams; and implementers;
- ≈ Field visits for data/information collection - using interviews and discussions with experts, key informants, as well as observations.

#### **1.4 Structure of the report**

This report consists seven chapters. Chapter One describes an introduction, background information, objectives of this project brief and the methodology adopted in data/information gathering exercise. Chapter Two presents detailed project description thereby highlighting major project components and activities. Chapter Three gives details on potential environmental and social impacts of the project whereas chapter four present the mitigation measures. The environmental and management plan is presented in Chapters Five while Chapter Six depicts on monitoring plan. Chapter Seven provides conclusion remarks whereas the last section of the report presents references and a list of appendices.

## Chapter Two

### Project Description

#### 2.1 Nature of the Project

Simiyu and Duma rivers are among the potential water source of Lake Victoria, which suffers from severe degradation. The proposed project is therefore a typical river bank rehabilitation and management initiative, in response to the above-mentioned degradation. Realization of the great potential for healthy and sustainable socio-economic and environmental development of the Lake Victoria basin lies in combining efforts and integrating the management of common resources. Bariadi district reiterates this need by taking positive measures to protect the deteriorating Simiyu and Duma sub-catchments by involving efforts from various departments and stakeholders in Bariadi district.

The banks of both two rivers are threatened by human activities like farming of vegetable, sugar canes, potatoes, maize, and fruits. The community around use the water for all domestic activities like washing, bathing, fishing and other related activities. The banks are further threatened by massive cattle keeping. Pebble, sand and stone mining are the worst activities that add more silt to the rivers.

The project therefore aims at setting the 60m buffer zone on both sides of the river catchment and planting indigenous trees within the buffer zone. All people depending on the river will be given other alternative activities like bole holes for; domestic and cattle, power tillers, bee keeping and milling machine. All these will be managed under the established Water User Associations (WUAs) that will be supported by by-laws. The expected project benefits include: reduced pollution (sediment and agrochemicals) to Simiyu and Duma rivers, and lake Victoria, increased community livelihood from forests products, improved community knowledge in conservation and water governance, increased catchment efficiency, improved equity in water allocations and well protected water resources base.

#### 2.2 Justification of the Project

The researches on sediment loading conducted in the Simiyu river catchment clearly indicate that there is a lot of silt being carried by the river to the lake from upstream areas including Bariadi district. Deposition of silt found at the Simiyu river estuary in Magu district results from the erosion of river banks caused by human activities along Simiyu and Duma rivers including unsustainable farming practices, deforestation and livestock grazing. In addition to sediment loading, agrochemicals which are used for plant protection and growth pose challenges to water resources in Simiyu and Duma rivers ultimately lake Victoria as final recipient. It is evident that, along Simiyu and Duma rivers within 60 meters vegetables, fruit crops and cotton are crops which are cultivated and application of agrochemicals is inevitable. Due to the size of the Simiyu and Duma sub-catchments, the two rivers are considered to be among the main contributors to

the pollution of Lake Victoria. Hence, the Bariadi district proposed catchment rehabilitation sub-project intends to bring positive impact with regards to the conservation and management of resources in Simiyu and Duma sub-catchments.

Bariadi district has been emphasizing trees planting and natural regeneration (ngitili) especially along water sources as well as creating awareness on environmental degradation and fast shrinking of natural resources particularly forests and water resources. However, these efforts have not yet become successful. Many trees are cut mainly for clearing land for cultivation as well as to meet household energy demand, continued poor farming practices, inadequate community institutions for water management leading to deterioration and pollution of water resources.

Gully erosion in Bariadi district on the other hand is increasing leaving the land which used to be fertile infertile. The eroded soil is deposited in the Simiyu and Duma rivers leading to siltation, increased turbidity and increasing eutrophication in the dams, rivers and Lake Victoria at large.

This proposal for the rehabilitation project responds to the Bariadi district catchment rehabilitation strategies as well as community felt needs in 45 villages. The project will increase efficiency to both Simiyu and Duma rivers to provide environmental services sustainably. In order to protect the river banks, water resources base and the associated eco-systems, it is therefore very important to support this project for the sustainable uses of Simiyu and Duma rivers which ultimately pour their wates into Lake Victoria.

### ***Purpose***

The main purpose of the project is the protection of Simiyu and Duma river banks in 45 villages in Bariadi district through sensitization and building the capacity of communities along Simiyu and Duma rivers and other stakeholders to participate in the protection, conservation and management of Simiyu catchment ultimately protection of Simiyu and Duma river banks.

### ***Beneficiaries***

The project primary beneficiaries are farmers, livestock keepers and communities living within 46 villages along Simiyu and Duma rivers. Others include communities in the downstream who use the resources from the two rivers. The Bariadi District Council, NGO's, Ministry of Water, Natural Resources and Tourism and Vice Presidents Office - Environment will be secondary beneficiaries. Other beneficiaries will include the aquatic flora and fauna and the surrounding environment.

## **2.3 Location of the Project**

Bariadi District is one of the 5 districts forming the newly established Simiyu Region (Figure 1). The district is bordered by Kwimba district on the west, Bunda and Serengeti districts on the north, Ngorongoro district on the east and Maswa and Meatu districts on the South. The total surface area of Bariadi district is 9,445.7 km<sup>2</sup> of which 4,591.7 km<sup>2</sup> is covered with an arable land suitable for agriculture and livestock keeping; 790 km<sup>2</sup> is covered by the Maswa Game Reserve and 395 km<sup>2</sup> is covered by the Serengeti National Park. The remaining area which is about 114 km<sup>2</sup> is covered by water bodies, forest and hilly area. The district is

divided into four divisions namely Ntuzu, Dutwa, Kanadi and Itilima; the four divisions are subdivided into 26 wards and 124 villages (Bariadi District Profile, 2009). The district has a total population of 736,710 (URT, 2012).

All the four divisions of Bariadi district fall in either Simiyu or Duma sub-catchments. Kanadi and Itilima divisions are located within the Simiyu catchment area; Kanadi has 3 wards and 10 villages whereas Itilima has 6 wards and 14 villages. The two remaining divisions are located within the Duma sub-catchment area of which Dutwa has 15 villages in 9 wards and Ntuzu has 2 villages in 1 ward within the catchment respectively. The proposed project interventions will therefore be implemented in 51 villages along the Simiyu and Duma rivers within Bariadi district.



**Figure 1:** Location of project area

## 2.4 Size and Capacities

The proposed project is basically an environmental and water resource conservation initiative. It will involve demarcation of Simiyu and Duma rivers boundaries (60m on both sides of the rivers) using concrete beacons. The beacons are of 1m height and will be established at 100m apart. The project will also accomplish trees and grasses planting in the demarcated buffer zone. A total of 189 km for both two rivers will be demarcated with beacons, and 500 hectares will be covered with vegetation cover.

## 2.5 Project Activities

The proposed project will be implemented in two main phase; Mobilization Phase and Monitoring Phase. Each phase is characterized by its activities as briefly described in the following sections.

### 2.5.1 Mobilization and Development Phase

This phase constitute activities that entail an overall arrangement, setting and carrying out of restoration activities. The activities include:

- ≈ Sensitize and build community capacity - on environmental laws and by-laws, proper use of agro-chemicals/organic pesticides and sanitation/use of latrines,
- ≈ Establish and train four water user associations (WUAs);

- ≈ Create community awareness and capacity building on Integrated Water Resources Management (IWRM);
- ≈ Demarcate boundaries of Simiyu and Duma rivers at 60 m from river bank in all 45 villages;
- ≈ Rehabilitate gullies and control ongoing soil erosion in 45 villages - capacity building on soil erosion control, survey the area, and grass, sisal and tree planting;
- ≈ Improve catchment vegetation cover and enhance non timber forest benefits.

### 2.5.1.1 Preparatory activities

Preparatory activities will include mobilization of resources (personnel, working tools and equipment as well as materials inputs).

### 2.5.1.2 Materials inputs

Project implementation will require various types of inputs of various quantities including pre-casted concrete beacons, tree seedlings, water and grass. Most materials will be obtained locally but others will be purchased from licensed local suppliers in Bariadi district. Table 1 shows approximate amount of materials that will be needed for the project.

Table 1: Materials requirement for buffer zone development activities

Type of Materials	Quantity	Potential Source	Distance from the Source
Pre-casted concrete beacons	3,800	Licensed manufacturers in Bariadi district	10 -130 km
Trees seedlings	To cover 500 ha	District and private nurseries in Bariadi district	20 -130km
Natural grasses	To cover 500 ha	Locally available in Bariadi district	0.5 - 10km
Lubricants for vehicles	Not established	Local suppliers in Bariadi district	20 - 130km
Fuel for vehicles	Not established	Local suppliers in Bariadi district	20 - 130 km
Water for trees planting	Not established	To be fetched from Simiyu and Duma Rivers	Within 60m

### 2.5.1.3 Equipment and machinery requirements

The project will employ various types of working tools and equipment as provided in Table 2 below. All of them will be obtained locally in Bariadi district.

Table 2: Working tools and equipment requirement

S/N	Type	Quantity	Duration	Source
-----	------	----------	----------	--------

			(Month)	
1	Hand tools (hoes, axles, wheel barrows, knives, canes, etc)	Various	3	Some purchased from local suppliers in Bariadi district and others hired from local communities
2	Trucks for transportation of materials (tree seedlings and concrete beacons) and working tools.	4	3	To be locally hired in Bariadi district
3	Vehicles for transportation of personnel.	4	12	LVEMPII and Bariadi District Council

#### 2.5.1.4 Transportation

The materials to the specific sites will be transported by means of vehicles using local district and village road networks.

#### 2.5.1.5 Storage of Materials and Working Tools

Working materials, tools and equipment will be stored at government offices in the village where the project will pass through Besides, vehicles will be fuelled, maintained and repaired at Bariadi township.

#### 2.5.1.6 The Workforce

Workforce selection during the buffer zone development phase will give preference to local community. Analysis of the project workforce requirement estimates that the activity will engage about 300 workers during the mobilization and buffer zone development phase. Tree, grass planting activities and beacons erection will be done by local community under the supervision of Bariadi District Council and LVEMP II staff. The scope of works, nature of the project and site location do not require the camping site to be established.

#### 2.5.1.7 Local supplies and services

Food supplies will be from the local suppliers in the respective villages and nearby places. Medical supply will be from local registered medical facilities in Bariadi district. Fuel will be supplied from licensed close-by stations in Bariadi township. Water for irrigation during trees/grasses planting will be fetched from Simiyu and Duma Rivers.

#### 2.5.1.8 Waste Generation and Management

The project through its workforce (people) and daily operational activities is expected to generate various types of wastes with different quantities. Waste

generation associated with the project are shown in Table 3. Most and critical wastes are expected to be solid waste.

Table 3: Management of wastes during the operation phase

Type of waste	Source and characteristics	Management procedure
Solid wastes	Shall include garbage (as a result of preparation and serving of food), rubbish (which includes papers, woods, tree leaves and branches, bottles, plastic materials, drums, containers, packaging materials etc) might be generated by the people who will be involved especially in the planting of the trees, overburden materials as a result of excavation works during setting of the beacons (mainly top soils), might be the only wastes to be generated.	<ul style="list-style-type: none"> <li>≈ On-site waste bins will be provided;</li> <li>≈ The solid waste generated will be collected using appropriate on-site bins and safely disposed off at the official dump sites;</li> <li>≈ Encouraging people to use biologically decomposable materials and reduce the use of disposable packages;</li> <li>≈ Discourage the cutting down of the existing trees for any use or during site preparation.</li> </ul>
Waste oils	Shall include leaking fuels and lubricants from poorly maintained and serviced trucks and vehicles that reaches the project area	No truck/vehicles will be allowed to reach the water course. They will be parked away (>100m) from the sources. In addition, neither maintenance nor repair shall be allowed in the project area. Only well serviced trucks and vehicles will serve the project.

#### 2.5.1.9 Work Supervision

The project supervision will be done by staff based at Bariadi District Council and LVEMP II. Local government leaders will also assist in supervision of some activities. This arrangement will ensure smooth running of the facilities and adhere to the environmental standards.

#### 2.5.1.10 Support Facilities and Services

**Water Supply:** Potable water will be needed by workers during the mobilization and buffer zone development phase. About 500 L/day will be required.

**Security:** The project will sensitize the local village government and community groups to act as watch dogs and assume a leading role protecting the project and its associated infrastructure. In this way, project sustainability will be guaranteed.

#### **2.4.2 Maintenance and Monitoring Phase**

Maintenance and monitoring phase will commence after the mobilization and buffer zone development phase have been completed. As such, this phase will involve the following activities:

- ≈ Project monitoring and evaluation - ensure regular project supportive; supervision visits and follow ups are prepared and conducted;
- ≈ Management of vegetation and erosion control;
- ≈ Supervision and monitoring;
- ≈ Capacity building for the community groups.

#### **2.4.3 Project Funding**

The total budgeted cost for the proposed project is about Tsh. 324,036,387/= Where by LVEMP II contribution (through WB funding) is TZS 291,289,937/= BDC is TZS 26,771,449/=.

## Chapter Three

### Identification of Environmental and Social Impacts

#### 3.1 Assessment Methodology

While identified potential environmental impacts that have been classified in accordance with activities causing them, the impacts were considered to be significant if:

- ≈ Are extensive over time and space;
- ≈ Are intensive in consideration or proportion to assimilative capacity;
- ≈ Exceed environmental standards or thresholds;
- ≈ Do not comply with environmental policies, land use plans and sustainability strategy;
- ≈ Adversely and seriously affects ecological sensitive areas; and
- ≈ Adversely and seriously affect heritage resources, other land uses, communities or indigenous people's traditions and values.

The significance criteria therefore have based on the magnitude scale and duration of the impact; exposure and probability of the impact; consequence of the impacts according to score/scale and colour code implication. Tables 4 - 6 describe in detail the significance criteria assigned for the various impacts of the project.

Table 4: Assessment of significance in terms of impact’s magnitude, scale and duration

Criterion	Description	Possible Results		
		Term	Description	Score
<b>Magnitude of the Impact</b>	An indication of the severity of the impact, either positive or negative.	Very High	Extreme effect - where natural, cultural or social functions or processes permanently cease.	5
		High	Severe effect - where natural, cultural or social functions are altered to the extent that they temporarily cease.	4
		Moderate	Moderate effect - the affected environment is altered but natural, cultural or social functions continue, albeit in a modified way.	3
		Low	Minimal effect - affects the environment in such way that natural, cultural or social functions and processes are not affected.	2
		Very Low	Minimal or negligible effect	1
		Unknown	Magnitude of the impact unknown	5
<b>Scale of the Impact</b>	An indication of geographical extent of the impact	National	Affects the resources of the country	5
		Regional	Affects the resources of the region	4
		District	Affects the resources of the district	3
		Local	Affects the project area and surrounding villages	2
		Site - specific	Localized, confined within the license area	1
		Unknown	Extent of the impact unknown	5
<b>Duration of the Impact</b>	An indication of duration or time over which the impact will be experienced.	Permanent	Will remain permanently	5
		Long term	Extends into the post- closure phase, but not Permanently	4
		Medium term	During the operational life of the project	3
		Short term	Shorter than the operational life of the project	2
		Transient	Very short duration	1
		Unknown	Duration of the impact is unknown	5

Table 5: Assessment of significance in terms of Exposure and Probability

Criterion	Description	Possible Results			Score
		Term	Description		
			Discrete Event	Prolonged Exposure	
<b>Exposure to Impact</b>	An indication of the frequency of the activity that may cause the impact, or the continuity of the exposure	Very High	Daily or continuous	Exposure in perpetuity	5
		High	Weekly	Continuous exposure into closure or post-closure phases	4
		Moderate	Monthly	Continuous exposure during construction and operations phases	3
		Low	Bi-annually	Continuous exposure throughout one phase	2
		Very low	Annually or less frequently	Prolonged exposure yet finishes before end of a phase	1
		Unknown	Frequently of activity unknown	Continuity of exposure unknown	5
<b>Probability of the occurrence</b>	An assessment of the degree of certainty associated with a potential impact	Highly likely	Very likely or certain to occur		5
		Likely	Likely to occur		4
		Possible	May possibly occur		3
		Unlikely	Unlikely to occur		2
		Highly unlikely	Very unlikely to occur, or almost impossible		1
		Unknown	Probability of the occurrence unknown		5

Table 6: Consequence assessment according to score/scale

Consequence	Magnitude + Scale + Duration	3-4	5-7	8-11	12-14	15
			Very Low	Low	Moderate	High
<b>Likelihood</b>	Exposure + Probability	2-3	4-5	6-7	8-9	10
		Very Low	Low	Moderate	High	Very High

In order to determine the overall significance of the impacts, a matrix of the scores of the “Consequence” and “Likelihood” was used as shown in Figure 7.1 below. The Colour codes in Figure 2 are used to show the significance of the impact in the following manner:

- ≈ White colour for “Very Low Significance”
- ≈ Green colour for “Low Significance”
- ≈ Orange colour for “Moderate Significance”
- ≈ Red colour for “High Significance”
- ≈ Black colour for “Very High Significance” .

The implications of these descriptions are shown in Table 7. Based on these implications, the mitigation measures and hence the ESMP were drafted as presented in sections 4 and 5 respectively.

		CONSEQUENCE OF IMPACT (Aggregate: Magnitude + Duration + Scale)				
		Very Low	Low	Moderate	High	Very High
LIKELIHOOD OF IMPACT (Compound: Exposure x Probability)	Very Low	VL	VL	L	L	M
	Low	VL	L	L	M	H
	Moderate	L	L	M	H	H
	High	L	M	H	H	VH
	Very High	M	H	H	VH	VH

Figure 2: Colour Codes for Impact Significance

Table 7: Colour Code Implications

Colour Code	Significance of the Residual Impact	Implications for Project	
		Positive Impacts	Negative Impacts
<b>VL</b>	Very low significance	Negligible effects	Negligible effects
<b>L</b>	Low significance	Some Benefits	Acceptable effect
<b>M</b>	Moderate Significance	Appreciable improvements to, or will sustain, existing resources	Effect is serious enough to cause concern. Changes to project design should be considered.
<b>H</b>	High Significance	Very substantial improvement to existing resources	Unacceptable effect. The project should not proceed unless the design is changed so that the significance of this impact is reduced to acceptable levels
<b>VH</b>	Very high significance	Extremely beneficial and enduring effect	An automatic fatal flaw. The project should not proceed unless the design is changed so that this impact is eliminated or its significance is reduced to acceptable levels.

### 3.3 Potential Environmental Impacts

#### 3.3.1 Mobilization and Development Phase Impacts

##### 3.3.1.1 Interruption to local fauna due to noise and vibration

Noise and vibrations are expected to be generated from motor vehicle transporting materials, working tools and personnel, such as trees seedlings and concrete beacons. These activities will cause disturbance to all living organisms living on surface, subsurface and even aquatic organisms. However, the mobilization activities will take place just shortly and trees/grasses planting will move relatively rapidly therefore noise and vibrations impacts will be more or less negligible. As such the impact is gauged to be negative, very low, short- term and low significance

### **3.3.1.2 Deterioration of ambient air quality by exhaust and greenhouse gases**

Worsening of ambient air by emissions (in the form of CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>) will come up from trucks and vehicles that transport equipments and materials. Even with well-maintained equipment, gases will be emitted from engine of motor vehicles transporting equipment, materials and personnel to the project area. Production of exhaust and greenhouse gases from those moving motor vehicles and trucks within the project site is expected to affect confined climatic conditions. The impact is negative, short-term and of low significance.

### **3.3.1.3 Enhancement of soil erosion**

Planting of trees and vegetation along the banks of Simiyu and Duma Rivers in Bariadi will engage excavation of holes and ground digging. While this activity is undertaken if there is poor planning and improper organization of excavated area, soil erosion might be accelerated especially if the activities are to be carried out during the rainy and windy seasons. When the topsoil is left bare this environmental problem becomes serious. And due to the small extent of this impact it can be categorised as negative, very low, short-term, medium significance

### **3.3.1.4 Generation of wastes**

During tree and vegetation planting along Simiyu and Duma River banks, potential impacts on the environment may be associated with the handling, storage and disposal of solid waste materials which include garbage (from onsite food serving), rubbish (i.e. woods, tree leaves and branches, bottles, plastic materials, drums, containers, polyethylene bags, packaging materials etc) and overburden materials. If not managed and disposed properly, solid wastes would pollute the environment. Most important sources of waste include leaking fuel and lubricants from poorly maintained vehicles and trucks that reach the ground and riverbanks. They are also a potential source of environmental pollution especially water and soil pollution. This impact is negative, short-term and of medium significance.

## **3.3.2 Maintenance and Monitoring Phase**

### **3.3.2.1 Ecological and water protection**

The project intends to establish a 60m buffer zone on the sides of Simiyu and Duma Rivers in 45 villages. The buffer zone will be planted with indigenous trees and grasses. There will be an enhancement of natural regeneration of vegetation cover. Hence the project is expected to conserve the riverbanks thereby enhancing vegetation thus control of erosion and improved water

quality over the long run. This impact is considered to be positive, very high, long-term and of high significance.

### **3.4 Potential Socio-economic Impacts**

#### **3.4.1 Mobilization and Development Phase Impacts**

##### **3.4.1.1 Creation of employment**

Employment creation will be enhanced by ensuring availability of skilled labor such as botanists, civil engineers, drivers, etc. Unskilled laborers will be obtained from among community where the project activities are implemented. Ensuring this is reasonably done both men and women will be involved. Employment opportunity will involve all people who will deal with insertion of concrete beacons, tree and glasses planting as well as those who will be selling food along the project area. The impact is positive, short-term, high significance as it will be for the benefit of the community surrounding and others.

##### **3.4.1.2 Nuisance due to poor waste management**

Much waste is expected to be generated during the development phase of tree planting and buffer zone demarcation. The impact associated includes poor handling, storage and disposal of the wastes and materials containing them. The major wastes are expected to be solid wastes which include garbage (from onsite food serving), rubbish (i.e. woods, tree leaves and branches, bottles, plastic materials, drums, containers, polyethylene bags, packaging materials etc) and overburden materials. This will create nuisance thereby impairing the aesthetic and hygienic status and may lead to eruption of diseases including cholera, malaria, stomach ache, etc. The impact is negative, short-term, low significance.

##### **3.4.1.3 Occupational health and safety risks**

During project implementation (planting of grasses and tree , demarcation of the river buffer zone), injuries to workers may be promoted by ineffective management of various activities of the project including negligence at work, fatigue due to understaffing and long working hours, lack or non-use of protective gears, low self-esteem, etc. This impact is negative, short-term, medium significance

## Chapter Four

### Environmental and Social Impacts Mitigation Measures

#### 4.1 Environmental Mitigation Measures

##### 4.1.1 Deterioration of ambient air quality by fumes

Fumes will emanate from trucks and vehicles that transport input materials, working tools and personnel to the project area. LVEMP II and all other project stakeholders will minimize fumes from generated by making sure that proper and adequate maintenance of trucks and vehicles and switching them off when not in use.

##### 4.1.2 Disturbance to local fauna due to noise and vibration

LVEMP II will carry out the following mitigation measures by:

- ≈ Selecting low-noise and quality equipments to used in project activities wherever possible and practicable;
- ≈ Trucks and vehicles will be maintained and serviced to minimize noise;
- ≈ Stationary trucks and vehicles will be prohibited near sensitive areas.

##### 4.1.3 Enhancement of Soil Erosion

The following measures will be conducted by project developer to address the impacts:

- ≈ Unnecessary excavation of the land for tree and grass planting, and for concrete beacons erection will be avoided;
- ≈ Planted trees and grass, and restriction of human activities into rivers catchment areas, will control severe soil erosion in the area;
- ≈ Point excavation for tree and grass planting, and for concrete beacons erection will be applied;
- ≈ Eliminate loose soil on the ground thereby ensuring proper backfilling of overburden materials after tree and grass planting and beacons installation;
- ≈ Avoid leaving the bare land thereby mulching the planted trees with grasses;
- ≈ The areas of exposed soil will be monitored during periods of heavy rainfall even after the end of project life.

##### 4.1.4 Environmental Pollution from Poor Waste Management

The normal and standard operational procedures to address the impacts of wastes shall be followed by LVEMP II and all its partners. To better manage wastes expected to be generated at the project area, the following general

measures will be taken into account by the developer. On-site waste bins will be provided. The solid waste generated will be collected using appropriate on-site bins and safely segregated and disposed off at the official dump sites; Encouraging people to use biologically decomposable materials and reduce the use of disposable packages; discourage the cutting down of the existing trees for any use or during site preparation.

Other disposal methods will be undertaken in accordance with legislation and standards, Local Government Authority (LGA) by-laws, and international agreements. Some of the wastes management measures especially solid wastes which are the major stream expected from the projects are highlighted below:

- ≈ Domestic solid wastes i.e. glass, tree pieces, paper, cans will be segregated using clearly marked bins and disposed off appropriately;
- ≈ Maintenance and packaging wastes (bottles, plastic materials, drums, containers) will be collected, compacted (if possible), segregated using clearly marked skips, labelled, stored in designated areas prior to disposal or recycling;
- ≈ Combustible solid wastes may be incinerated and the ashes collected and disposed off in accordance with legal requirements;
- ≈ To address the impacts of waste oils no truck/vehicles will be allowed to reach the water course. They will be parked away (>100m) from the sources. In addition, neither maintenance nor repair shall be allowed in the project area. Only well serviced trucks and vehicles will serve the project.

#### **4.1.5 Enhancement of environment and water conservation**

The following measures will be carried out to enhance the impact of environment and water conservation:

- ≈ Only indigenous trees (i.e. acacia tree species) and grasses will be planted in the proposed Simiyu and Duma Rivers buffer zones;
- ≈ The effective maintenance and monitoring programme to better care for planted trees and grasses, and erected beacons will be established and implemented;
- ≈ Establish and implement replacement programme for dry and dead trees and grasses;
- ≈ Mobilize, facilitate and motivate local community based groups for participatory forest management of the proposed Simiyu and Duma Rivers buffer zones and the water resources in general.

## **4.2 Socio-economic Mitigation Measures**

### **4.2.1 Creation of employment**

LVEMP II and its partners will implement the following enhancement measures:

- ≈ Ensuring availability of skilled labor. Unskilled laborers will be obtained from among local communities in the project areas;
- ≈ Local employment will be optimized by offering skills and literacy training to especially youth;
- ≈ The national and international labour standards and regulations shall be observed;
- ≈ Job opportunity will be allocated fairly among women and men;
- ≈ Maximize procurement of supplies at local level e.g. tree seedlings, concrete beacons, simple working tools and equipment, etc.

#### **4.2.2 Nuisance due to poor waste management**

This impact will be mitigated as described in section 4.1.4 above.

#### **4.2.3 Occupational health and safety risks**

The following mitigation measures will be implemented by LVEMP II and its partners in order to tackle occupation, health and safety hazards:

- ≈ Install safety signs throughout the project area particularly in the working areas;
- ≈ The appropriate and recommended PPEs such as safety boots, gloves, helmets, goggles and overall jumpers will be provided to all laborers to prevent them from likely health and safety risks;
- ≈ Establish a code of practices at the work place
  - Comply with relevant Tanzania (OSHA, 2003) Performance Standards on health and safety requirements;
  - Observe standards procedures and guidelines regarding specific site operations, certified operation equipment, work procedures, inspections and maintenance systems, traffic management;
  - The Emergency Response Equipment and Procedures will be prepared and implemented.
- ≈ Observe for water and sanitation provisions:
  - Make a proper assessment of water needs;
  - Increase existing water extraction and storage capacity;
  - Establish water saving measures including an Education, Information, and Communication (EIC) package with “DOs and DON’Ts”.

# Chapter Five

## Environmental and Social Management Plan

### 5.1 Introduction

Environmental and Social Management Plan (ESMP) sets the “environmental and social conditions” that will be abided by LVEMP II in the course of implementing this proposed project. It aims at ensuring effective implementation of the proposed mitigation measures. The objective of the ESMP is to set out clearly the key components of environmental and socio-economic management for the project and thereby ensure that the basic concepts are realized throughout the mobilization, development, maintenance and monitoring phases of the project. The basic concepts for consideration are:

- ≈ Negative impacts on physical, biological and socio-economic setting are mitigated;
- ≈ Benefits that will arise from the development of the project are enhanced;
- ≈ Compliance with Tanzanian legislation and consistency with international guidelines and best practice is achieved;
- ≈ Development programs are identified and implemented with the active involvement of the community and sustainable outcomes are achieved;
- ≈ Maintenance of good will and good relations with communities, civil society and governments at local and national levels; and
- ≈ The project will endeavour to ensure that resources are available to implement the ESMP throughout all phases of project development and closure.

### 5.2 Project Management

This proposed project will be carried out within 45 villages along the Simiyu and Duma Rivers in Bariadi district under the management of Bariadi District Council (BDC) with the technical support of DLFT in collaboration with the community leaders in the project areas. The Bariadi District Executive Director (DED) will be supported by the DLFT made up by multi disciplinary professionals who will take the management roles on behalf of the district council. The DLFT will lead the project planning, baseline surveys, sensitizations, supportive supervisions of the activities as well as the monitoring and evaluation activities.

At ward levels the WDCs will assist the project to make sure the agreed plans are implemented by respective villages as agreed. The WDC will also participate in the capacity building sessions and in M&E activities on their respective wards. At the village levels the project will be under the village councils with the assistance of village environment. The established WUAs will also participate in the project management by making sure that the water resources governance and management are planned and implemented at their respective villages. The project management will be done by all responsible parties from the district to the sub village levels.

The project activities will be organized in the following manner:

- The DLFT being the over seer of the project will be the main organizer of the project works;
- Project planning will be lead by the DLFT in collaboration with the beneficiaries at various levels;
- Implementation of project activities will be conducted by the beneficiaries themselves under the supervision of the DLFT in the respective disciplines;
- Project monitoring and evaluation will be done in a participatory approach; the M&E will be planned by the DLFT but its implementation will involve all key players from the district level to the WUAs and committees levels;
- The project finance will be managed through the normal district council financial system whereby the DED will be the accounting officer with the assistance of the district treasurer;
- Commissioning of the Strategic Natural Resources Intervention Project to the Bariadi District Council.

The ESMP for this proposed project is described Table 8. The amount estimated for implementation of ESMP is TZS 60,000,000 Note that estimated costs for implementing the mitigation measures are just indicative. Appropriate bills of quantities should clearly give the actual figures. In any case the consultant used informed judgement to come up with these figures.

Table 8: Environmental and Social Management Plan

Potential Impact	Management Measure	Target Level/Standard	Responsible	Estimated Cost (TZS)
<b>Mobilization and Development Phase</b>				
Deterioration of ambient air quality by exhaust and greenhouse gases.	<ul style="list-style-type: none"> <li>• Ensure proper and adequate maintenance of trucks and vehicles that serve the project;</li> <li>• Switch off trucks and vehicles when not in use.</li> </ul>	As minimum as possible	LVEMP II Bariadi District Council	6,000,000
Interruption to local fauna due to noise and vibration.	<ul style="list-style-type: none"> <li>• Select low-noise trucks and vehicles wherever possible and feasible;</li> <li>• Ensure proper and adequate maintenance of trucks and vehicles serving the project;</li> <li>• Avoid locating stationary trucks and vehicles near sensitive areas.</li> </ul>	<60Db 2 - 14mm/s	LVEMP II Bariadi District Council	6,000,000
Enhancement of soil erosion.	<ul style="list-style-type: none"> <li>• Avoid unnecessary excavation of land for tree/grass planting and for installation of concrete beacons;</li> <li>• Implement point excavation for tree/grass planting and erection of concrete beacons;</li> <li>• Eliminate loose soil on ground by ensuring proper backfilling of overburden materials after tree planting and beacons installation;</li> <li>• Avoid bare land by mulching the planted trees with grasses;</li> <li>• Monitor areas of exposed soil during periods</li> </ul>	As minimum as possible	LVEMP II Bariadi District Council	12,000,000

Potential Impact	Management Measure	Target Level/Standard	Responsible	Estimated Cost (TZS)
	of heavy rainfall.			
Environmental pollution and nuisance from poor waste management	<p>The LVEMP II shall follow the normal and standard operational procedures to address the impacts of wastes. The procedure shall involve segregation of waste generated, recycling and reuse of waste products where possible and carry out appropriate disposal of waste products. The various disposal methods will be undertaken in accordance with legislation and standards LGA by-laws, and international agreements. Specifically:</p> <ul style="list-style-type: none"> <li>• Domestic solid wastes i.e. garbage, paper, cans will be segregated using clearly marked bins and disposed off appropriately;</li> <li>• Maintenance and packaging wastes (bottles, plastic materials, drums, containers) will be collected, compacted (if possible), segregated using clearly marked skips, labelled, stored in designated areas prior to disposal or recycling;</li> <li>• Combustible solid wastes will be burnt and the ashes collected and disposed off in accordance with legal requirements;</li> <li>• In order to address the impacts of waste oils no truck/vehicle will be allowed to reach the water course and only well serviced trucks and vehicles will serve the project.</li> </ul>	No exposed soil and waste materials remain on the land after tree and grass planting and beacons erection.	LVEMP II Bariadi District Council	12,000,000
Creation of	• Recruitment of work force especially	All unskilled	LVEMP II	Part of

Potential Impact	Management Measure	Target Level/Standard	Responsible	Estimated Cost (TZS)
Employment	<p>unskilled labour will be dominated by local people;</p> <ul style="list-style-type: none"> <li>Local employment will be optimized by offering skills and literacy training to especially youth;</li> <li>Project implementation shall observe national and international labour standards and regulations;</li> <li>Maximize procurement of supplies at local level e.g. tree seedlings, concrete beacons, tools and equipment, etc.</li> <li>Establish a system to manage local expectations.</li> </ul>	labourers are local people	bariadi District Council	project running costs
Occupational health and safety risks.	<ul style="list-style-type: none"> <li>Provide appropriate working equipment and tools and ensure proper use;</li> <li>Provide appropriate PPEs and ensure proper use;</li> <li>Provide for reasonable working hours, conditions and facilities;</li> <li>Establish a code of practices at the work place;</li> <li>Observe for water and sanitation provisions.</li> </ul>	OSHA Guidelines  ILO	LVEMP II	10,000,000 (PPEs)  4,000,000 (First Aid Facilities)
<b>Maintenance and Monitoring Phase</b>				
Enhancement of environment and water conservation.	<p>This impact will be enhanced by:</p> <ul style="list-style-type: none"> <li>Planting indigenous trees (i.e. acacia tree species) and grasses on the proposed Simiyu and Duma Rivers buffer zones;</li> </ul>	The whole buffer zones of two rivers are fully covered with	LVEMP II  Bariadi District Council	10,000,000

Potential Impact	Management Measure	Target Level/Standard	Responsible	Estimated Cost (TZS)
	<ul style="list-style-type: none"> <li>• Establish and implement replacement programme for dry and dead trees and grasses;</li> <li>• Establish and implement an effective maintenance and monitoring programme to care for planted trees and grasses and established beacons;</li> <li>• Mobilize, facilitate and motivate local community based groups for participatory management of Simiyu and Duma Rivers buffer zones and the water resources in general.</li> </ul>	trees and grasses and well demarcated all the time.		

## Chapter Six

### Environmental Monitoring Plan

#### 6.1 Introduction

The Environmental Monitoring Plan (EMP) is a vehicle for the effective implementation of the mitigation measures to ensure successful execution of the Project in an environmentally sound manner. It provides mechanism to address the adverse environmental as well as social impacts of the proposed project during its execution, to enhance project benefits and to introduce standards of good practice to be adopted for all project works. For each expected impact, the EMP provides the following information:

- ≈ A specific description and technical details of monitoring measures that include the parameters to be measured, the methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions;
- ≈ Monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and to equip information on the progress and results of mitigation, e.g. by annual audits and surveys to monitor overall effectiveness of the EMP;
- ≈ The EMP also provides a specific description of institutional arrangements, i.e. who is responsible for carrying out the mitigating and monitoring measures. Additionally, the EMP includes an estimate of the costs of the measures and activities recommended so that the project proponent (LVEMP in this matter) can budget the necessary funds.

#### 6.2 Objectives of EMP

The objectives of project's EMP are:

- ≈ To define the responsibilities of project components;
- ≈ To identify the monitoring parameters;
- ≈ To design the monitoring mechanism;
- ≈ To facilitate the implementation of mitigation and enhancement measures
- ≈ To take timely action in case of an unexpected situation;
- ≈ To support smooth implementation of project with minimum losses to environmental and social infrastructure;
- ≈ To ensure compliance with national and international requirements.

The details of environmental issues, environmental impacts, proposed parameter to be monitored and timing agencies responsible for execution of proposed actions during project execution are presented in tables 9 below.

Table 9: Environmental Monitoring Plan

Phase	Potential Impact	Parameter to be Monitored	Monitoring Frequency	Monitoring Area	Measurement Unit	Target Level / Standard	Responsible	Estimated Cost Tshs
Mobilization and Development Phases	Enhancement of soil erosion	Soil erosion tendencies	Every month	The project area	None	No erosion tendencies	LVEMP II	4,000,000
	Environmental Pollution and Nuisance from Poor Waste Management	Hygienic and aesthetic status of the area	Every work day	The project area	N/A	As clean as possible	LVEMP II BDC	5,000,000
	Creation of Employment	Number of local people employed	Continuously during execution	Project records	Number	As maximum as possible	LVEMP II, BDC & Village Governments	Project running costs
	Occupational health and safety risks	PPEs; working tools and conditions	continuously during execution	Project area	Incidence	No or minimum accidents	LVEMP II, BDC & Village Governments	4,000,000

Phase	Potential Impact	Parameter to be Monitored	Monitoring Frequency	Monitoring Area	Measurement Unit	Target Level / Standard	Responsible	Estimated Cost Tshs
Monitoring Phase	Enhancement of environment and water conservation	Types of trees and grasses planted  Involvement of local groups	continuously during execution and monitoring	Project area	Types and number	No foreign trees/grasses planted  Local groups take care of buffer zone	LVEMP, BDC & Village Governments	9,000,000

## Chapter Seven

### Conclusion

This project of protection of Simiyu and Duma Rivers is of the great potential for healthy and sustainable socio-economic and environmental development of the Lake Victoria basin. It is expected to respond to the environmental and social-cultural threats identified by Bariadi district by implementing strategies to ensure the effects caused by threats are solved. Some of anticipated positive impacts of the project include: increased regeneration of natural vegetation and biodiversity; enhanced water quality; increased water quantity for community, livestock, environmental flows and ultimately for lake Victoria in the downstream; improved community livelihood. All proposed project activities will be implemented in environmental responsible manner consequently no major negative environmental and social impacts of considerable significance are expected to be occurred.

On the other hand, some negative environmental and social impacts have been predicted including soil erosion, environmental pollution and nuisance from poor waste management as well as occupational health and safety risks to be associated with project implementation and monitoring activities. The environmental and social management plan as well as environmental monitoring plan have been prepared in order to manage and monitor the predicted negative impacts.

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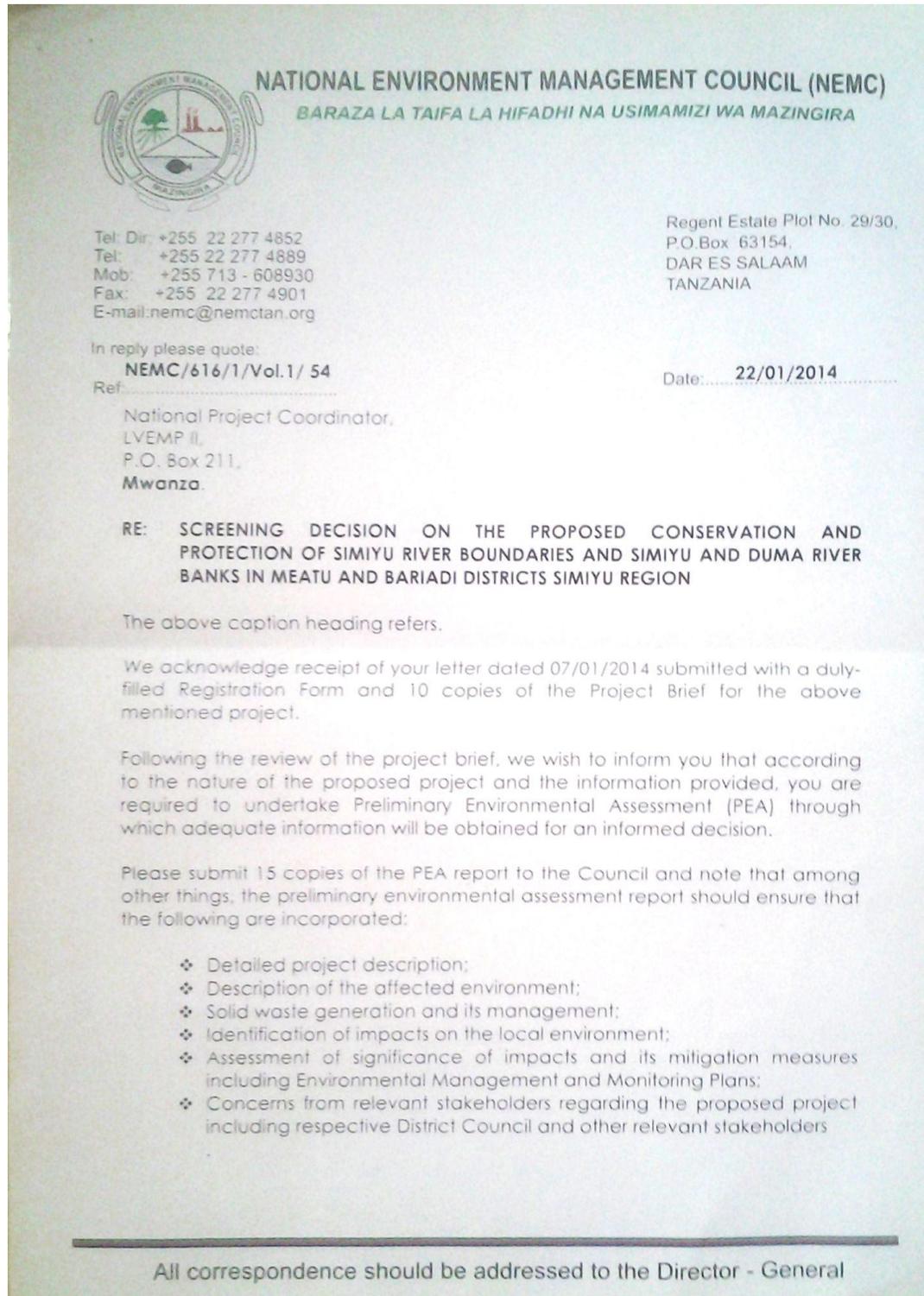
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## Appendices

### Appendix 1: NEMC Screening and Reviewed Decision



 **NATIONAL ENVIRONMENT MANAGEMENT COUNCIL (NEMC)**  
*BARAZA LA TAIFA LA HIFADHI NA USIMAMIZI WA MAZINGIRA*

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In reply please quote:  
**NEMC/616/1/Vol.1/ 54**

Ref:..... Date:..... **22/01/2014**

National Project Coordinator,  
LVEMP II,  
P.O. Box 211,  
Mwanza.

**RE: SCREENING DECISION ON THE PROPOSED CONSERVATION AND PROTECTION OF SIMIYU RIVER BOUNDARIES AND SIMIYU AND DUMA RIVER BANKS IN MEATU AND BARIADI DISTRICTS SIMIYU REGION**

The above caption heading refers.

We acknowledge receipt of your letter dated 07/01/2014 submitted with a duly-filled Registration Form and 10 copies of the Project Brief for the above mentioned project.

Following the review of the project brief, we wish to inform you that according to the nature of the proposed project and the information provided, you are required to undertake Preliminary Environmental Assessment (PEA) through which adequate information will be obtained for an informed decision.

Please submit 15 copies of the PEA report to the Council and note that among other things, the preliminary environmental assessment report should ensure that the following are incorporated:

- ❖ Detailed project description;
- ❖ Description of the affected environment;
- ❖ Solid waste generation and its management;
- ❖ Identification of impacts on the local environment;
- ❖ Assessment of significance of impacts and its mitigation measures including Environmental Management and Monitoring Plans;
- ❖ Concerns from relevant stakeholders regarding the proposed project including respective District Council and other relevant stakeholders

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All correspondence should be addressed to the Director - General

Upon submission of the report, the Council will arrange for a review of the document. The budget for this review meeting amounts to Tsh **8,671,000/=**. As attached below.

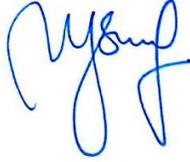
Please, contact us in case you need additional information or clarification on this process through Telephone No.0715 511131.



K.C.Sengoe  
**For: Director General**

CC: Dr. William J. Mwegoha,  
Ardhi University,  
P.O. Box 35176,  
**Dar es Salaam.**

Appendix 2: List of Expert who carried out the initial assessment

Name	Qualification	Role	Signature
<b>EIA Expert</b>			
Dr. William Mwegoha	BSc, MSc, - Chemical and Process Engineering  PhD - Environmental Engineering	<b>TEAM LEADER</b> Environmental issues	
Leonard Gastory Lugali	BSc - Civil and Water Resources Engineering  MSc - Integrated Environmental Management (MIEM)	Civil engineering, water resources and waste issues	
<b>Other Experts</b>			
Mathias Kabyemera	BA Geography and Environment	Socio-economic issues	
Vaiileth Biphuye	B.Sc. Environmental Engineering	Environmental issues	
Rhoda Mutalemwa	B.Sc. Environmental Laboratory Science and Technology	Environmental issues	
Evody Ndumiwe	B.Sc. Environmental Engineering	Environmental issues	