



GOVERNMENT OF MALAWI

MINISTRY OF AGRICULTURE

SHIRE VALLEY TRANSFORMATION PROJECT

**Draft Environmental and Social
Management Plan (ESMP) for Phase 2**

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List of Acronyms

BMPs	Best Management Practices
BWO	Bulk Water Operator
CC	Construction contractor
DPNW	Department of National Parks and Wildlife
EAD	Environmental Affairs Department of the Ministry of the Environment and Natural Resources
EF	Environmental Flow
EGENCO	Electricity Generation Company Malawi
E&S Requirements	Environmental, Social and Health and Safety Requirements of the bidding documents, comprising as a minimum relevant parts of the General Conditions of Contract, Particular Conditions of Contract, Employers Requirements (including the Environmental and Social Specification), Technical Specification and Specific Specification
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FS	Feasibility Study
GoM	Government of Malawi
Ha	Hectares
IFC	International Finance Corporation
KRC	Korea Rural Corporation
LNP	Lengwe National Park
Masl	Meters above sea level
MDoA	Malawi Department of Antiquities
MWK	Malawian Kwacha (1\$ US equals +/-715 MWK)
MoAIWD	Ministry of Agriculture, Irrigation and Water Development
LNP	Lengwe National Park
OHSM	Occupational Health and Safety Manual
PAP	project-affected people
PCCPLTRPF	Preparation and Implementation of a Communications, Community Participation, Land Tenure and Resettlement Policy Framework
PMP	Pest Management Plan
PMT	Project Management Team
PPE	Protective Personal Equipment
PPP	Public Private Partnership

RAP	Resettlement Action Plan
RoW	Right-of-Way
RPF	Resettlement Policy Framework
SOCFE	Smallholder Owned Commercial Farm Enterprise
SRBMP	Shire River Basin Management Program
STD	Sexually Transmitted Disease
SVTP	Shire Valley Transformation Program
TORs	Terms of Reference
WESM	Wildlife and Environmental Society of Malawi

1. INTRODUCTION

This is the Environmental and Social Management Plan (ESMP) for Phase 2 of the Shire Valley Transformation Project (SVTP). This ESMP specifies the environmental and social management processes to deliver the mitigation and enhancement measures to be carried out in Phase 2 of the program. A separate ESMP has been prepared for Phase 1 of the program. This ESMP should be read alongside the updated Environmental and Social Impact Assessment (ESIA) report for the program, where a full description of the predicted impacts and effects can be found, together with the rationale for the mitigation and enhancement measures: this ESMP focusses on the mechanisms for the delivery of the mitigation measures required in the ESIA. The ESMP also describes the monitoring and institutional strengthening measures that will be implemented to deliver the mitigation. There is also a Pest Management Plan (PMP) report which specifically sets out the mitigation to be put in place to manage the impact of any pesticide, herbicide, fertilizer or other farm chemical use during agricultural activities. The Labour Management Procedures (LMP) describe the working arrangements and health and safety measures that will apply for workers undertaking certain project activities (for example on sub-projects).

This ESMP report is the work of Malawi's Ministry of Agriculture, and it builds on work covered under the ESMP for Phase I that was produced by a consulting firm, BRLi. In parallel, the Korea Rural Corporation (KRC) is the consultant that prepared the technical Feasibility Study (FS) for SVTP, and is currently supervising the construction activity on Phase 1.

The Government of Malawi may update this ESMP, in response to additional public and stakeholder comments as well as any new technical project information that may become available, particularly once the detailed engineering design of the canal infrastructure for Phase 2 if there are significant differences from the FS. The canal in question is MC2 (Bangula line), and its associated secondary, and tertiary canals, pipelines and in-field works

The Shire Valley Transformation Program

SVTP is a 14-year program (2017-2031) structured around three coordinated pillars:

- Providing reliable, professionally managed and sustainably financed irrigation service to a large number of irrigators in the Lower Shire;
- Establishment of smallholder-owned commercial farm enterprises transitioning into commercial agriculture from subsistence farming and integrating them into commercial value chains; and
- Support to farmer organizations within a comprehensive land use plan; supporting land tenure strengthening and consolidation; as well as natural resources management.

The Project Objective for SVTP is to (i) provide access to reliable gravity-fed irrigation and drainage services, (ii) secure land tenure for smallholder farmers, and (iii) strengthen management of wetlands and protected areas in the Shire Valley. The program has been designed to comply not only with national requirements, but also the World Bank Environmental and Social requirements as set out in

their Operational Policies (for Phase 1 works) and their Environmental and Social Framework (for Phase 2 works).

The program is based around an agriculture project aiming at irrigating about 43,370 ha of lands in Chikwawa and Nsanje Districts, Malawi. It involves constructing: a water intake inside Majete Wildlife Reserve (MWR) at Kapichira reservoir; a fish barrier to prevent migration of Tiger Fish; three main canals for total length of about 133 km; secondary canals; and night storage, and it establishes command areas within which farmer co-operatives plan and develop commercial agricultural enterprises.

The Project overall goal is to benefit local communities within the Shire Valley, which is a major positive impact given the dryness conditions that prevail in the area. Improving livelihood will lead to other indirect positive impacts: improved access to education and health, new opportunities for agribusiness, etc. Because the project relies on the natural resources of the Shire Valley, a key component of the project is to protect and enhance these natural resources.

SVTP is being delivered in three phases, for which the main construction and agricultural activities are:

- Phase 1: Construction of water intake, fish barrier, 33.8 km of main canal 1 (MC1), 18 km of main canal 2 (MC2) bifurcation point, 10.7 km of main canal 3 (MC3), 52.6 km of associated secondary canals and other associated infrastructure, and establishing Command areas for 22,280 Ha of irrigation
- Phase 2: Construction of 77.3 km of main canal, associated secondary canals and other associated infrastructure, and establishing Command Areas for 21,090 ha of irrigated agricultural land
- Phase 3: Scaling up of agricultural commercialization across the program and consolidation of SOCFEs

In general terms, SVTP-I initiates the process on all pillars with a major focus on irrigation service provision to the SVTP-I area, land tenure, farmer organization and natural resource management as these precede any downstream development. It contains a sub-component of the SVTP called "Sub-component 2.2 Natural Resources Management" which is supported with GEF-6 funding and promotes an inter-sectoral approach to the management of the Lower Shire landscape by addressing biodiversity conservation, protecting and enhancing the role that forests, woodlands, rangelands and wetlands play in mitigating climate change; and promoting sustainable approaches to forest management that protect forest resources and deliver benefits to local communities. At landscape and park level, this sub-component:

- Invests in community-level natural resource management in areas adjacent to the irrigation and conservation areas (Lengwe National Park, Mwabvi and Lengwe National Parks, Matandwe Forest Reserve and the Elephant Marsh proposed Community Conservation Area) and in wildlife corridors,
- Provides targeted support to these conservation areas to strengthen conservation and community management and encourage private sector investments (e.g. by tourism concession

investors) that could boost revenues for re-investment in local community development and conservation management,

- Invests in establishment of the Elephant Marsh Community Conservation Wetland Area, with a strong emphasis on community-based natural resources management strategies.

The subsequent phases of SVTP will build on these measures, to support the transformation of the valley. A description of the activities to be undertaken as part of SVTP Phase 2 (to which this ESMP applies) is provided in Chapter 3.

Environmental and Social Impact Assessment

An Environmental and Social Impact Assessment (ESIA) for the program was undertaken and disclosed in 2017. The ESIA studied all three phases of the program, based on a feasibility design for the entire project, to ensure that the cumulative impacts of the project were properly considered. The program-wide ESIA has been updated as part of the preparation for the Phase 2 works, and now reflects the impacts arising from Phase 1 works as well as the current understanding of the works to be undertaken as part of Phase 2 and Phase 3.

The ESIA describes the environmental and social receptors and the potential direct, indirect and cumulative impacts that may arise from the project. It also describes the mitigation and enhancement measures to be delivered as part of the project, as far as they are known.

Objective of this ESMP

This ESMP focuses specifically on works to be undertaken during Phase 2 of SVTP, and details how the environmental and social impacts and risks associated with the project and specifically phase 2 will be managed. It provides the roles and responsibilities for ensuring delivery of the mitigation and enhancement measures described in the ESIA.

Therefore, the ESMP has been developed to cover the environmental and social mitigation and enhancement measures specific to SVTP Phase 2, such as:

- a. The impacts on Lengwe National Park (LNP) which will arise from MC 2 (the Bangula Canal) in Phase 2;
- b. Environmental and social impacts from the southern boundary of LNP to Bangula;
- c. Construction of MC 3 (Supuni line) to Illovo including pipelines and associated in-field works;
- d. Development of irrigation blocks; and
- e. Monitoring the implementation of the ESMP

Thus, ESMP proposes ways to ensure that measures are operational. It provides cost estimates, schedules and assigns responsibilities for each mitigation and monitoring measure.

A major target of this ESMP is to ensure that the Detailed Design study integrates relevant mitigation measures from the outset into the civil engineering works. This will ensure that many measures will be a contractual requirement for delivery during the construction phase.

Natural Resource Management measures began as part of Phase 1 of the program will be continued and expanded through Phase 2. They are likely to involve small scale activities to benefit management of protected areas, such as the construction of ranger camps, boreholes, park roads, fences, fish ponds and improvements to existing park infrastructure, as well as the collection of baseline monitoring data and studies into changes that may be required with respect to waste management. This ESMP describes the approach to managing the environmental and social risks of these works.

The ESMP also sets out how other key requirements described in the ESIA are to be delivered including:

- aligning, confining and undertaking work in Lengwe National Park (LNP) to minimize impacts on wildlife tourism in LNP;
 - compensation for impacts to property and land for Phase 2;
 - installation of sufficient troughs and cattle bridges along the main canals;
 - installation of measures to prevent drownings of people and animals;
 - treatment against schistosomiasis (Bilharzia), which is common disease in irrigation schemes;
 - appropriate wording and inclusion of all applicable mitigation measures in the call for tender (and terms of reference) and in the contract of the construction contractor including leverages such as nonpayment for non-compliances;
 - selection of a construction contractor with good reputation environmentally and socially proactive; and
 - inclusion of all applicable mitigation measures in the Scheme operator (Bulk Water Operator) call for tender (and terms of reference and contract).
-
- Land tenure, as they will be dealt with in the Resettlement Action Plan (RAP) in line with the Land Acquisition Act of 2016 and ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.

Cost of the ESMP

The ESMP has budgeted costs for the proposed mitigations for Phase 2 including infrastructures to be built. The following table provides a summary of these costs.

*Table 1: Summary of costs for the ESMP for SVTP-II
(to be revised as the detailed design work is undertaken)*

Mitigation / Compensation	Cost for mitigation / compensation in USD	Cost for mitigation / compensation in Malawi Kwacha (1 USD = 715 Kwacha)
	1,114,174.00 (best case scenario: 1 year loss of business revenue) to 1,118,600.00 (worst case scenario: 2 year loss of business revenue)	911,394,332 (best case scenario: 1 year loss of business revenue) to 915,014,800 (worst case scenario: 2 year loss of business revenue)
Cost of Action Plan for health and safety (assumes 3 years of sensitization: to be increased as part of SVTP-III)	1,018,880	833,443,840
Cultural Heritage	194,050	158,732,900
Cost of Action Plan for socioeconomic impacts (including cattle bridge, footpath and vehicle bridge) and cultural heritage Plan	4,063,280	2,905,245,200
Total cost**	From 6,390,384.00 to 6,394,810.00	From 5,227,112.00 to 5,230,954,580.00

** The cost excludes measures included in the detailed design (such as over and underpasses for wildlife, canal alignment and canal lining through Lengwe National Park, cattle troughs, and pedestrian bridges) and construction-related measures that will form part of the Contractor's Environmental and Social Management Plan (C-ESMP). These will be part of the contract costs and will be reflected in the bill of quantities provided by bidders for undertaking the work. The costs for the Pest Management Plan (PMP) are provided in detail in the PMP.

Although the Project leads to uncommon impacts, with commitments, funds and reliable mitigations, it could become an example for future irrigation schemes in sensitive areas.

2. RELATION BETWEEN THE ESMP AND OTHER STUDIES

The ESMP has many links with other studies completed to date. These links can be distinguished in three different categories:

- Relations with the Project technical studies (feasibility and design study);
- Relations with other projects, including the Shire River Basin Management Program (SRBMP); and
- Relations with other studies under the SVTP.

The following table presents these relations.

Table 2: Relations between studies

SVTP Project technical studies	Relation
Shire Integrated Flood Risk Management Strategy Project (Atkins, 2012)	Objective of the Plan was to assist the GoM in development of an Action Plan to address the flood risk situation in the Lower Shire in an integrated way, based on sound diagnostics and systems to assess and implement future interventions. The Action Plan aimed to address both the hazard (Water regime) and the vulnerability to these hazards (adaptation of human behavior). This life and livelihoods are better protected from flood risks and enhance the capability of socio economic development in the basin. This was done in harmony with Malawi growth and development strategies which emphasis sustainable growth and MDGs. The study helped inform the design of SVTP.
Shire Valley Irrigation Project Phase I Project Preparation Activities. Appraisal Report (AfDB, October 2012)	The GoM has for many years intended to develop irrigated agriculture in the Lower Shire Valley and a number of successive studies and reports has been prepared, to help prepare for the SVTP project. The report identified the need for additional activity: Study on water availability at Kapichira – pre-feasibility level study. This was undertaken under the SRBMP-1 (Norplan report 2013)
Hydraulic model study at the headpond of Kapichira dam	Although the title of the study is hydraulic modeling, the main objective of this study is to assess the impact of the Project on the reservoir sedimentation pattern. The study's objectives are also to avoid negative impact on sediment flushing operations at the power station and to minimize the entry of sediment into the proposed feeder canal system of SVTP.

SVTP Project technical studies	Relation
Feasibility Study report (December 2016)	<p>The 2017 ESIA is based on the scheme described in the FS. The 2021 update of the ESIA is based on the latest detailed design for Phase 1 works (under construction) provides to the FS study the series of mitigations that need to be technically tested. These mitigations only relate to infrastructures or changes in the Project design that will be required to mitigate of avoid impacts.</p>
Preparation and implementation of a Communications, Community Participation, Land Tenure and Resettlement Policy Framework (PCCPLTRPF) (on going)	<p>Many elements on socioeconomics are dealt with in the PCCPLTRPF. The ESIA make references to it. This assignment is divided in several studies:</p> <ul style="list-style-type: none"> • Communication strategy: This study describes the main stakeholders and presents a SWOT analysis. It also presents the communication strategy toward stakeholders. • Gender and Youth Strategy Study: This study describes the current challenges that women and young people face. This report also recommends a series of measures and guidelines aiming at these two groups. In addition, roles of various stakeholders and monitoring actions are defined. • Grievance redress mechanism: This study describes the current method for grievance redress (revolving around traditional leaders). This study also implements the Grievance Redress Mechanism (GRM) and Grievance Redress Committee (GRC) to ensure that people’s opinions and grievances regarding the project are documented and addressed. In addition, monitoring of complaints will be carried out under this mechanism. • Resettlement Policy Framework This document provides the basis for the Resettlement Action Plan (regulatory review, gap analysis, etc.). It deals with impact of resettlement but also the issue of access to sources of livelihood and to impact on cultural heritage. The ESIA refers to this study, especially when it comes to the number of affected villages and the number of bridges that shall be built to cross canals (and footpaths for people). • Stakeholders’ views report This report presents the main conclusions from various stakeholder’s consultation. It discusses stakeholders’ views on several topics: land tenure, access to irrigated land, resettlement, agricultural development, access to water for livestock and gender vulnerability.

SVTP Project technical studies	Relation
	<ul style="list-style-type: none"> • Socio-economic baseline report <p>This report presents the main socio-economic figures of the SVTP area and discusses about health, land tenure, livestock, agriculture, etc. It also includes a chapter on communities' views of the Project.</p>
Agricultural Development Planning Strategy (2016)	<p>This study describes the crops of SVTP. Many elements related to agriculture and fisheries are discussed in this report. It discusses about potential options for mitigating smallholder livestock farm impacts and potential impacts for fish farming, that have been considered during the preparation of this project and integrated as necessary into SVPT.</p> <p>In addition, this study describes efficient organization of producers that shall be implemented</p>
Pest Management Plan (2021)	<p>The PMP identifies the main pest based on the type of crops and proposes measures to fight pests.</p>
A Cultural Heritage Impact Assessment Report (2016)	<p>This report provides information on cultural heritage baseline conditions by identifying key sites of interest within the SVTP study area. The report has informed the ESIA.</p>
Public-Private Partnership (PPP Feasibility study) (on going)	<p>The PPP study informed the ESIA about public-private partnership arrangements for irrigation services for SVTP. The ESIA also makes recommendations about arrangements and responsibilities of the Bulk Water Operator for maintenance and its relationship with park management (Lengwe). The ESIA also helps to identify environmental and social risks regarding the BWO</p>
Lengwe National Park, 5 years business plan 2016-2020	<p>This document, written by DNPW, describes the reserve's objectives and presents its zoning. It also describes the various infrastructures of the reserves.</p>
Lengwe National Park, General Management Plan 2016-2020 work document	<p>The 2017 ESIA refers to this document as it defines objectives for the LNP as well as identifies issues with wildlife and infrastructures of the park.</p>
Detailed Design Studies (after the FS) for Phase 1. The Detailed Design works have not started yet for Phase 2 but is complete for Phase 1 works.	<p>The 2017 ESIA proposed measures for study in the Design Study for Phase 1.</p> <p>The updated 2021 ESIA describes the outcome of these design studies for Phase 1 and by providing detail of what was constructed. It has also reviewed the current baseline conditions against the FS design for Phase 2, to update the assessment.</p>
2017 Environmental and Social Impact Assessment	<p>The 2017 ESIA studied the predicted impacts and effects of all three phases of the proposed SVTP in preparation for Phase 1 works. It was disclosed in August 2017.</p>
2017 Environmental and Social Management Plan	<p>The 2017 Environmental and Social Management Plan set out the management arrangements for delivering the mitigation measures to be delivered as part of Phase 1 works</p>

SVTP Project technical studies	Relation
2021 Update to ESIA	An update of the ESIA in 2021 was undertaken to ensure that the current design was reflected for Phase 1 works, and to reflect any changes in baseline conditions that have occurred since 2017. The 2021 ESIA was prepared in advance of Phase 2 works.
Lengwe National Park, General Management Plan 2021-2026	The 2021 update of the ESIA refers to this document as it defines updated management objectives for the LNP.
Matandwe-Mwabvi Protected Area Complex Integrated Management Plan 2021	Details of Natural Resource Management measures to be provided as part of SVTP will be information by the management objectives set out in this plan.
SRBMP studies	Relation
<p>Component A – Shire Basin Planning Sub-components: A1-Basin planning framework A2-Institutional capacity A3-Water resources information systems A4-Program management monitoring & evaluation</p> <p>Component B – Catchment Management Sub-components: B1-Catchment planning, monitoring and learning B2-Rehabilitation targeted catchments B3-Alternative rural livelihoods B4-Ecological management</p> <p>Component C – Water related infrastructure Sub-components: C1- Kamuzu Barrage C2-Flood management C3-New water investment</p>	<p>The recommendations of the ESIA and ESMPs have taken into account the studies undertaken as part of SRBMP, and those that were particularly relevant, for example by providing baseline information, information on cumulative impacts or details of management interventions that will improve the natural resources in the catchment. Most activities of the SRBMP relate to catchment management and rehabilitation, as well as the upgrading and future operation of the Kamuzu Barrage that influences the Shire River's flow, well upstream of the SVTP.</p>
Implementation Service Provider (ISP) for Flood Risk Management (SRBMP-1)	<p>This report deals with risk from floods, and has been considered as part of the hydrological information included in SVTP. In some sections, it presents measures to minimize flood impacts on human safety from:</p> <ul style="list-style-type: none"> • Ruo River • Thangadzi East River • Mwanza River • Lalanje River

SRBMP studies	Relation
	<ul style="list-style-type: none"> • Tombokamwa River
<p>Study on water availability for Irrigation and hydropower production on Shire River at Kapichira Falls (Norplan, 2013)</p>	<p>Prepared under SRBMP, the objective of the study was:</p> <ol style="list-style-type: none"> a) To assess utilization levels of Shire River, suggest areas for improvement so that reliable water is available for a number of purposes. b) To independently assess the water availability for hydropower and irrigation purposes at Kapichira falls. c) To recommend the best possible strategies for accommodating demands for irrigation and hydropower and explore possible trade-offs in use. <p>The study gave priority to satisfy the demand for irrigation (SVTP) project to the demand of water for maximum energy production. The consequences of shortage of water has been calculated as loss of and value of energy production.</p>
<p>The Elephant Marsh General Adaptive Management Plan 2018-2022 (2017).</p> <p>Prepared under SRBMP-1</p>	<p>The aim of this management plan is to ensure that the integrity of the Elephant Marsh is maintained and enhanced, together with the natural functions that these wetlands perform and the benefits that they supply, including the sustainable utilization of wetland resources, without undermining future adaptive capacity. The management plan has informed the measures undertaken as part of the Natural Resource Management components of SVTP.</p>
<p>Shire River Basin Management Program (Phase I) Project Final Environmental and Social Assessment Report (July, 2013)</p>	<p>The overall assessment of impact of SRBMP planned activities is dealt with in this report (except for the impact of Kamuzu barrage).</p>
<p>Independent Environmental Impact Assessment for the Upgraded Kamuzu Barrage (December 2011)</p>	<p>An ESIA was carried out under the Component C.1: upgrading of the Kamuzu Barrage. The barrage is a key element that has many interactions with SVTP as the current objective of the upgraded barrage is to raise the water level up to 40 cm in Lake Malawi.</p>
<p>Climate resilient livelihoods and sustainable natural resources management in the Elephant Marsh, Malawi. Ministry of Water Development and Irrigation. <u>Description of the livelihoods in the area of the Elephant Marsh Report</u> November 2016</p>	<p>This study addresses the following objectives (MRAG, 2016):</p> <ul style="list-style-type: none"> • Describe local livelihoods, including spatial and temporal use of resources; • Assess the past, present and potential future influence of human livelihoods on the Elephant Marsh, and what effect these will have on the functional resilience of the Marsh in the future, and the implication for climate change; • Identify the socio-economic impacts of livelihoods and how climate change might affect these livelihoods;

SRBMP studies	Relation
	<ul style="list-style-type: none"> • Describe the risks to livelihoods (e.g. flooding or overfishing), and current strategies to increase resilience to these risks that will be exacerbated by climate change; and • Provide an assessment of the support mechanisms for community welfare in line with possible flood mitigation measures and disaster management strategies.
<p>Climate Resilient Livelihoods and Sustainable Natural Resource Management in the Elephant Marsh, Malawi <u>Hydromorphology study</u></p>	<p>The hydromorphology study objectives are to:</p> <ul style="list-style-type: none"> • To establish the current status and recent trends of the hydromorphology of the Elephant Marsh. <p>To establish a hydraulic model predicting flooding patterns in the Elephant Marshes since flow records began.</p> <ul style="list-style-type: none"> • To evaluate historic land-use change (especially deforestation and agriculture) and its effect on sedimentation and siltation. • To map historic changes in the channel patterns in the marshes.
<p>Climate Resilient Livelihoods and Sustainable Natural Resource Management in the Elephant Marsh, Malawi. SubStudy 3. <u>Ecosystem Services of the Elephant Marsh</u>. (December 2016).</p>	<p>This study is a desktop study which:</p> <ul style="list-style-type: none"> • Describes the ecosystem services provided by the Elephant Marsh in physical terms and provide desktop estimates of their economic and social value; • Draws comparisons with other wetlands in Africa of a similar nature; • Discusses how capacity of the system to deliver these services responds to hydromorphology how this has changed over time; • Discusses the wetland’s sensitivity and adaptive capacity to multiple pressures, with a description of those pressures.
<p>Climate Resilient Livelihoods and Sustainable Natural Resource Management in the Elephant Marsh, Malawi SubStudy 4: <u>Biodiversity of the Elephant Marsh</u> (2016)</p>	<p>“This sub study forms part of a larger study on the Elephant Marsh which also includes studies of the hydrodynamics, local communities and ecosystem services, in order to inform a management plan for the marshes and in order to prepare an application for Ramsar status as a wetland of international importance” (Anchor, 2016).</p> <p>This sub-study aimed at describing (through surveys), biodiversity of Elephant marsh. Specialized surveys and studies of several taxonomic groups were carried: plants, aquatic invertebrates, dragonflies, butterflies, reptiles, amphibians, fish, birds and mammals.</p>

SRBMP studies	Relation
<p>Climate Resilient Livelihoods and Sustainable Natural Resource Management in the Elephant Marsh, Malawi</p> <p>Analysis of the potential effects of alternative future scenarios of flow and/or management on the ecological condition of the Elephant Marsh (Ecosystem Functional Model (DRIFT) 2016)</p>	<p>This sub study explores the potential effects of alternative future scenarios of flow and/or management on the ecological condition of the Elephant Marsh.</p>

3. SVTP PHASE 2 PROJECT LOCATION AND DESCRIPTION

This chapter summarizes the works to be undertaken as part of SVTP-II. The irrigation scheme will involve the construction of a new main canal (connecting to SVTP-1) between the northern boundary of Lengwe National Park and Bangula. Secondary canals (which may be open or piped) will be constructed to take water from these to Command Areas, within which SOCFEs will be assisted in the establishment of commercial farm enterprises. Night storage facilities will be created at some locations, along with other canal infrastructure (such as bridges, culverts and siphons, maintenance road). An operator will be appointed to manage the main canal and secondary canal network.

Construction of SVTP-II main canal is expected to start in 2022. The total cost of SVTP Phase 2, taking into account direct and indirect construction costs, is estimated at around 250 Million USD. Figure 1 shows the layout of SVTP-II in the context of the whole program.

Within the command areas, SOCFEs will be provided with professional advice regarding the establishment of irrigated farm enterprises and their associated infrastructure (such as farm roads, wood lots, drip irrigation, storage).

Recognising the importance of the water catchment, measures will also be taken to strengthen the management of the natural resources within the Lower Shire Valley. Further details of these works are provided below.

3.1 Canals

There will be a Main Canal and Secondary Canals and Pipelines to convey water to the Command Areas, of which the stretch of the Bangula Canal from the northern border of Lengwe National Park to Bangula will be built in SVTP Phase 2. This will be approximately 77.3km long.

The majority of main canal will be lined with concrete, although design options are being explored for a more 'wildlife friendly' lining for the first 14km stretch of the Bangula Canal as it passes through Lengwe National Park. Other measures to minimize fragmentation within Lengwe National Park are also to be explored during detailed design, including the locations for overpasses and underpasses for wildlife, and optimizing the alignment to minimise impacts to the thicket (an area of Critical Habitat).

The following table sets out the characteristics of the Bangula Canal, based on the FS.

Table 3: Main Bangula Canal Characteristics

	Side Slope of Canal	Canal Length (km)	Water Depth (m)	Average Velocity (m/sec) at max. capacity	Peak flow (m ³ /s)	Bed width (m)	Upper width (m)	Total Right of Way (RoW) (m)
Bangula Canal (also called Main canal 2)	1H/1.5V	77.8	1.8	1.50	29	8.1	13.5	30-45

In some area, open canal may be replaced by siphons (for example, when crossing large rivers). As presented in the ESIA, canal crossings of rivers could be (i) siphons; (ii) bridges; (iii) arches; or (iv) large box culverts with natural bottoms to ensure wildlife and fish movement. At least 2 siphons are planned for SVTP-II, although during detailed design, additional siphons may be included for example at Lengwe National Park and Nasawa School. Culverts are planned where topographic changes are high, but floods are small. Culverts are also planned to cross small-scale rivers and roads.

The design will avoid channelization of rivers and no river training works are envisaged that would adversely affect natural habitats such as riverine forests or thickets. River training will be restricted to small, localized works at the points where the main canals cross rivers. Channelisation of watercourses will be avoided, but may be necessary within Command Areas for field drainage into the natural rivers and outfalls.

Secondary canals will be constructed as needed to supply the Command areas, and the secondary canals are expected to end at night storage. The detailed design for these secondary canals will be undertaken in consultation with the SOCFEs, to optimize the connection points to the farms. Many of the secondary canals are expected to be piped rather than in open canal. Tertiary canals will be designed and implemented by SOCFEs, to meet their farm business needs.

3.2 Night Storage

Night water storages will be built, although their locations are not yet known for Phase 2. Night storage will be sized according to the need of each Command Area, from 119m by 119m to 54m by 54m, and hold water to a depth of approximately 1.8m. The Night Storage will comprise earth bunds with puddled clay base, and will be fenced to enhance safety.

3.3 Command Areas

Command areas have been identified and for SVTP Phase 2 consists of three zones:

- Zone B: 9,925ha (total area, which is partly made of Illovo estate)
- Zone C: 10,749ha (total area)
- Zone D: 4,076ha (total area)

The total area is 24,750ha of land. The command areas are currently under subsistence farming.

Within each command area the area to be supplied with irrigation will cover 21,090ha (excluding the farm roads, set aside land, canal and irrigation infrastructure and farm buildings needed in the command areas). Some of this land will be set aside to conserve remnant natural habitats, as grazing land, woodlots, or for other purposes as presented in section 6.1.

The irrigation and drainage system and farm roads in a unit parcel of land will be developed with advice from the agricultural advisors, and in accordance with the crops to be grown. Typically, farm roads inside the farmland have been planned to be spaced at every 1.5 km distance, will be marram or other

natural surface, and wide enough for the passage of farm vehicles necessary to tend to the agricultural land.

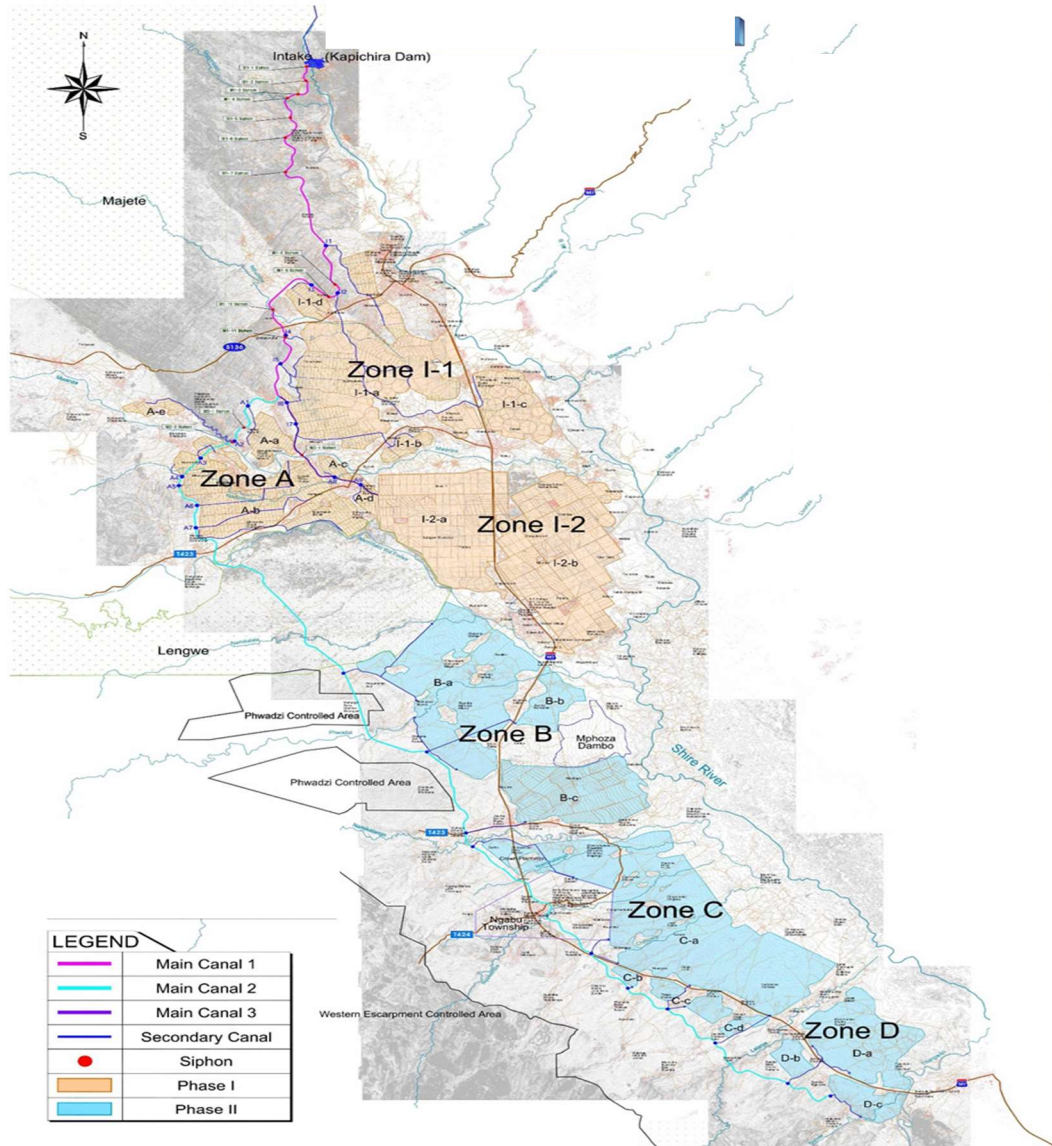


Figure 1:

Layout of SVTP

3.4 Operation of the Irrigation Scheme

A tendering process for a Bulk Water Operator for all the main canals (including the parts built under SVTP-II) will be undertaken in 2022. The water is expected to start flowing inside the water intake at Kapichira Dam towards the end of year 2023 at the earliest, and the Bulk Water Operator will need to have established the working protocols prior to the opening of the project.

The canals will be gravity fed. The daily time for irrigation depends on the irrigation methods. For pivot irrigation system, irrigation time is 24 hours, a whole day. For furrow irrigation, water application is normally 12 hours, during the daytime. Therefore, Branch canals shall be used only for 12 hours based on furrow irrigation methods. The main canals are designed for 24-hour continuous supply, for the whole year. Therefore, there is an operating time gap between the main canals and the Branch canals. Night storages will allow storing water when water is not needed in Branch canals.

The gates will be operated by an automatic control system. When the operator inputs the required amount of water into the system, the system will automatically operate the gates based on the relation between the flow rate, gate opening and water level variation. The 12 sluice gates are arranged in two partitions, the first one comprising 8 gates and the second one 4 gates. The second partition will allow abstraction of 18 m³/s, and will be operated when the water requirements at the scheme is less than 18 m³/s. The first partition will allow abstraction of up to 32 m³/s and will be operated when the water requirements at the scheme are between 18 m³/s and 32 m³/s. Both partitions will be operated for scheme water requirements above 32 m³/s to the maximum requirement of 50 m³/s (KRC, 2016).

3.5 Operation of the Farms

Resource efficiency and safety considerations will be issues to be addressed as part of the operation of the farms. Measures to ensure the training, PPE and processes for the safe transport, storage, use and disposal of farm chemicals will be incorporated into the operational plans, in accordance with the principles established in the Pest Management Plan

Farms will be established in the Command areas, which will be managed by a SOCFE. The SOCFEs will be provided with consultant support through a SOCFE Development Service Provider and through Agricultural Commercialization Technical Assistance to assist in the business planning and in the operational planning of the new enterprise. The business plans will help the SOCFEs identify the necessary farm investments to be implemented to ensure that the ESHS measures (including PMP) are integrated into the farming operation.

In addition, SOCFEs will employ a Farm Manager to organize farm operations. The Terms of Reference for the Farm Manager will require the following while assisting the SOCFEs prepare their operation plans:

- Integrate requirements of PMP into farm operations.
- Establish health and safety procedures for farm workers to ensure farm operations do not present a risk to farmers or neighboring communities.
- Formulate waste management procedures, including for the transport, storage and disposal of hazardous materials
- Foster collaboration with other livestock and smallholder farmers with respect to use of crop residues, manure, and livestock feed and passage.
- Once the full soil surveys are available, land that cannot be farmed shall be designated as grazing areas, woodlots, or other non-irrigated lands.
- Water and energy resource efficiency measures.

3.6 Other Works

3.6.1 Natural Resources Enhancement measures

The Lower Shire Valley includes ecological regions, protected areas, and biodiversity hotspots which are essential to the maintenance and functioning of the Lower Shire watershed. However, critical aspects of the watersheds are becoming degraded, leading to reduced water availability, deteriorating water quality, increasing vulnerability to droughts and floods, and reducing agricultural productivity. The planned project activities will strengthen the management and sustainability of key protected areas (Lengwe, Mwabvi), the Elephant Marsh (EM), and forest reserves (Matandwe, Thambani, and Thylo(TBC)), and will include the development of park trails/roads, ranger camps, eco-tourism facilities and cultural sites, fences, water holes, and utilities as appropriate to achieving the aims of the management plans for these protected areas. Additional information will be gathered from the valley in the form of wildlife and wetland inventories, and identification of invasive species to assist in managing these issues.

Accompanying these proposed investments will be critical community livelihoods interventions in the areas around the protected areas to strengthen co-management and reduce direct threats to aquatic and terrestrial biodiversity, such as overfishing and habitat destruction. Importantly, SVTP-II will support strengthening the sustainable management of the Elephant Marsh, which provides a unique habitat sanctuary to birds and flora, through the implementation of its Community Conservation Area Management Plan (developed under SVTP-I) including through further promoting ecosystem-based fisheries management.

3.6.2 Waste Management Planning

Key natural resources are under threat not only from overexploitation and habitat encroachment, but also from pollution control and solid waste management practices in the project area, for example from unregulated waste dumping and burning, including hazardous waste disposal. As the Lower Shire transforms and the generation of waste increases, there is a necessity to prepare the services for the communities and private enterprises to manage pollution and comply with environmental regulations. Studies will be conducted to determine mechanisms and strategies for management of the threats to biodiversity and ecological values posed by invasive species, increased generation of waste, and increased demand for natural resources that is expected to occur throughout the transformation of the valley.

3.6.3 OHS training programs

According to ILO, the agricultural sector presents key challenges for safety and health of farmers and communities. Measures to safeguard community health, for example through providing the necessary infrastructure to identify and prepare for an increase in number of waterborne diseases will be included within SVTP-II.

The transformation of the valley will lead to new health and safety risks within the Lower Shire Valley. In addition to increased health risks from diseases commonly associated with irrigated agriculture, there are safety risks associated with the use of pesticides, herbicides and fertilizers and with the operation of new equipment and machinery.

The presence of the main canal through villages and rural land may prove attractive to the local communities, and measures to facilitate safe access to water have been designed into the project, such as cattle troughs, access stairs and escape ladders. In addition, a program of sensitization of the local communities and school children will be undertaken, to warn of the risks associated with the canal infrastructure.

4. STRUCTURE OF THE ESMP

The 2021 update of the ESIA for SVTP describes in detail the mitigation, monitoring and institutional strengthening measures that are to be provided during Phase 2 to manage the environmental and social risks for the project.

Chapter 5 of this ESMP describes the mechanism for delivering the mitigation measures that are to be implemented during the canal and associated infrastructure construction works. These include the measures to be integrated into the main construction contracts to ensure that: the works do not spread beyond the works boundary; sensitive environmental receptors are protected; and the health and safety of the workers and community is preserved.

It also includes measures for the canal system operator, for the preparation of the command areas and for farm operations.

The detail of some of mitigation measures will be developed as part of the design development to be undertaken during 2022 works. These measures will be incorporated into the final design for canal and associated infrastructure to be provided for construction and the mechanism for delivering this mitigation measures is provided in Chapter 6.

Chapter 7 provides details of the approach for mitigating works on Lengwe National Park, including an optimized alignment of the canal through Lengwe National Park that minimizes impacts to the thicket, the surface of the canal, locations of overpasses and underpass, and the enhancement measures to facilitate long term management of the park.

Chapter 8 presents the action plans for addressing Social Impacts, in addition to the measures incorporated into the design of the Works or into the Construction and Operator's contracts.

Chapter 9 describes the approach for managing the environmental and social risks of all the other works to be provided, including the provision of the Natural Resource Management Measures which are yet to be designed. It sets out the approach that will be taken to manage the environmental and social risks of these works and deliver the appropriate mitigation to ensure Malawian and World Bank requirements are provided.

The approach to monitoring compliance with the ESMP is set out in Chapter 10, along with the monitoring indicators.

5. DELIVERING CONTRACTOR AND OPERATOR PERFORMANCE

This section describes the approach to be taken to ensure civil works contractors are aware of the E&S Requirements, and that they are held to account for delivering to the E&S Requirements during the construction of the canal, associated infrastructure and the preparation of the command areas. It also sets out how the Operator of the canal infrastructure will ensure that continued operations comply with World Bank requirements and Malawi regulations.

5.1 Construction Contractor for Main Canal and Associated Infrastructure

With respect to the Construction Contractor, the E&S Requirements comprise the measures set out in the contract, including the General Conditions of Contract, Particular Conditions of Contract, Technical Specification, Specific Specification, and Employers Requirements. The Employers Requirements include the Environmental and Social Specification, where the project specific and unique (i.e. additional to the measures included in the other parts of the contract) mitigation and monitoring measures are detailed. The relevant General Conditions of Contract are found in the *Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer (“Red book”) Second edition 2017* published by the Federation Internationale Des Ingenieurs – Conseils (FIDIC), and the relevant Particular Conditions of Contract are those taken from the World Bank’s Standard Procurement Document for Works, 2021.

The Bidding Document includes the E&S Requirements and also sets out the information to be provided by Bidders for evaluation. This includes the Qualification Criteria to be met, and the information to demonstrate that they have the experience and understanding to comply with the E&S Requirements. The preparation of the Bidding Documents is informed by the program ESIA and any other relevant Environmental and Social documentation, as unique impacts and risks to the project require specific interventions.

5.1.1 Unique Risks to be Managed by the Contractor

The following table provides a summary of the unique impacts identified in the ESIA to arise during the construction work of SVTP-II. These are the risks that need to be managed by the Contractors employed for construction works outside of Lengwe National Park, and the additional measures risks that need to be managed by the Contractor who will construct the works through Lengwe National Park. Risks that need to be managed as part of the design development are described in Chapter 6, and compensation arrangements for impacts to Lengwe National Park are described in Chapter 7.

Summary of Impacts from ESIA		
Impact		Significance
General	Construction risk and nuisances: communities, workers and the environment are at risk from construction activity (traffic, noise, forced labour, child labour, dust, OHS, security, HIV/communicable diseases such as COVID etc.) along canals and quarries	Minor

Summary of Impacts from ESIA		
Impact		Significance
Impact 1	Impacts from crossing rivers including disturbance to fish migration to spawning sites: construction will necessitate crossing rivers and will involve construction of permanent culverts and bridges over water courses, as well as localized river training. These will affect the geomorphology of rivers and affect access of fish to spawning sites	Moderate
Impact 2	Impacts from pollution and damage: construction may result in pollution to rivers and land that will subsequently be used for producing crops for consumption. These may affect the water quality of rivers and present health hazards to farmers and consumers	Negligible
Impact 3	Impacts from earthwork and land leveling, and impacts from borrow pits, quarries and disposal sites: construction will necessitate excavation of earth and rocks for the canal and the command areas, which may present safety hazards to workers and the community	Moderate
Impact 4	Workers influx: the project will require important workforce consisting of workers from outside of the valley, including foreign workers. Land will also be required for machinery storage and workers' camps, bringing workers in proximity to local communities. There is a risk that buildings and amenities in these camps do not respect quality standards and present a safety hazard to workers and the community	Moderate
Impact 5	Job opportunities: work will require unskilled and skilled labour for construction	Minor (positive)
Impact 6	Damage and loss of buildings and other infrastructures: construction activity could damage or destroy buildings and other infrastructures that according to the design should be retained	Minor
Impact 7	Loss of physical cultural heritage: the canal alignment route and borrow pits will affect some known and unknown cultural heritage sites (mainly pottery)	Minor
Impact 8	Disturbances of wildlife and vegetation in Lengwe National Park: work will generate noise and necessitate forest and thicket clearing in the right-of-way destroying some habitats and startling wildlife	Moderate

5.1.2 Preparing the Bidding Document

When preparing the Bidding Document, PMT environmental, social and procurement specialists will work together to ensure that all requirements are included. The Bidding Documents will include details of the Qualification Criteria to be applied, the Management Strategies and Implementation Plans that the Bidders will be required to submit for evaluation, and Key Personnel to be provided.

Qualification Criteria

During the tender process, bidders will be required to demonstrate experience of constructing canal infrastructure safely and without polluting environmentally sensitive locations. With respect to the selection of the contractor for the works through Lengwe National Park, the bidders will also be required to demonstrate their experience of constructing infrastructure projects through protected areas without deleterious impacts to wildlife.

Management Strategies and Implementation Plans

Bidders will be required to submit Management Strategies and Implementation Plans that describe the exact methods that they will employ with respect to:

1. Safety of excavations
2. Keeping construction activity (including materials) within site boundaries
3. Avoiding pollution of land or watercourses
4. Worker facilities (canteen, rest areas, toilets and wash areas) and worker transport
5. Managing the influx of workers
6. Establishing Works camps and construction compounds

No Management Strategy or Implementation Plan of more than 3 pages of A4 will be required of bidders (clarity and brevity is expected), but the arrangements are expected to be adequately detailed to be implementable during works. They will be accompanied by diagrams, as necessary, to illustrate how these aspects of the works can be undertaken in accordance with the contract E&S Requirements.

Environmental, Social and Health and Safety Key Personnel

Bidders will be required to submit CVs for the key personnel who will be responsible for day to day management of the contractors' environmental, social and health and safety program. The key personnel shall have the following qualifications and experience:

<i>Key Personnel</i>	<i>Minimum Qualification</i>	<i>Minimum Experience</i>
Environment Manager	Degree in Environmental Management or other Natural Resources related topic	7 years' experience of managing environmental aspects of linear infrastructure construction works. Familiarity with legal environmental requirements in Malawi and demonstrated experience of delivering best practice measures in countries of low capacity..
Health and Safety Manager	NEBOSH General Certificate International qualifications from IOSH	7 years' experience of managing health and safety during linear infrastructure construction works. Familiarity with legal health and safety requirements in Malawi and demonstrated

	Member of professional body (for example IOSH)	experience of delivering best practice safety measures in countries of low capacity.
Social Specialist	Degree in Sociology, Gender , Development studies or a relevant degree of comparable relevance Membership of relevant professional body will be an advantage	7 years' experience of managing social programs during construction works on behalf of contractors. Familiarity with legal social, gender and youth requirements in Malawi.
GBV Specialist	Degree in Sociology, Gender, Development studies, Security studies or a relevant degree of comparable relevance Membership of relevant professional body will be an advantage	7 years' experience of managing GBV actions and advocacy during construction works. Familiarity with legal social, gender and youth requirements in Malawi.

For selecting the contractor to undertake works through Lengwe National Park, the key personnel will have the following qualifications and experience:

<i>Key Personnel</i>	<i>Minimum Qualification</i>	<i>Minimum Experience</i>
Environment Manager	Degree in Environmental Management or other Natural Resources related topic	10 years' experience of managing environmental aspects of linear infrastructure construction works. Familiarity with legal environmental requirements in Malawi and demonstrated experience of delivering best practice measures in countries of low capacity and within Protected Areas of rich biodiversity value, together with experience in infrastructure construction in sensitive environmental locations/conditions
Health and Safety Manager	NEBOSH General Certificate International qualifications from IOSH	7 years' experience of managing health and safety during linear infrastructure construction works. Familiarity with legal health and safety requirements in

	Member of professional body (for example IOSH)	Malawi and demonstrated experience of delivering best practice safety measures in countries of low capacity.
Social Specialist	Degree in Sociology, Gender , Development studies or a relevant degree of comparable relevance Membership of relevant professional body will be an advantage	7 years' experience of managing social programs during construction works on behalf of contractors. Familiarity with legal social, gender and youth requirements in Malawi.
GBV Specialist	Degree in Sociology, Gender, Development studies, Security studies or a relevant degree of comparable relevance Membership of relevant professional body will be an advantage	7 years' experience of managing GBV actions and advocacy during construction works. Familiarity with legal social, gender and youth requirements in Malawi.

5.1.3 The Environmental and Social Specification

In preparing the Environmental and Social Specification, the impacts and mitigation required in the ESIA (including that summarized above) will be considered, along with the generic mitigation measures contained in any Technical Specification of the contract, and the General and Particular Conditions of Contract, the World Bank ESF/Safeguards Interim Note: *COVID-19 Considerations in Construction/Civil Works Projects* to ensure there is no repetition, dilution or confusion caused between the parts of the E&S Requirements. The General Conditions of Contract and Particular Conditions of Contract are not repeated here, and only additional requirements to mitigate the unique impacts from the ESIA will form part of the Environmental and Social Specification and are set out here.

The following table sets out the measures to be included within the Environment & Social Specification of the Bidding Documents, and any associated General or Particular Conditions of Contract.

Table 4: Measures to be included in the Environmental and Social Specification

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
General	<i>Environmental and Social Performance Security</i> Commensurate with the High Environmental and Social Risks of the project, an Environmental and Social Performance Security of	4.2

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	2% of the Contract Value shall be required. For the Contractor undertaking the works through Lengwe National Park, the Environmental and Social Performance Security shall be 3% of the Contract Value.	
General	<p>As required by GCC/PCC4.1, before the start of any construction works, the Contractor will prepare and submit to the Supervising Engineer their Construction Environmental and Social Management Plan (CESMP). No works can start until the Supervising Engineer has confirmed that adequate protection measures are in place.</p> <p>The E&S Specification shall require the Contractor to prepare CESMPs for each Camp Site, disposal site, borrow pit, and quarry, as well as a CESMP that addresses the general construction works to be undertaken along the main canal. A separate CESMP will be prepared for the works to be undertaken within Lengwe National Park. As required by Malawian law, the Contractor shall be responsible for undertaking and Environmental and Social Impact Assessment of ancillary features such as new quarries and borrow pits they may open. The CESMP and any required ESIA's will be prepared to the satisfaction of the Supervising Engineer, PMT, EAD and the World Bank.</p> <p>The contents of the CESMP shall include details of the methods, equipment, resources, approach and training that the contractor will take to protect environmental and social receptors. As a minimum the CESMP shall include:</p> <ul style="list-style-type: none"> • Layout of camp sites, including annotations showing the protection measures to be provided • Fencing, guarding and protection of sites and working areas • Waste management: collection, storage and disposal • Wastewater management: collection, storage and disposal (disposal to watercourses will not be permitted) • Measures to prevent the pollution of land or water • Measures to control dust so it does not cause a nuisance to people and does not damage vegetation, including dust 	4.1

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	<p>arising from local roads as a result of their use by project vehicles</p> <ul style="list-style-type: none"> • Measures to prevent noise or light pollution to local communities or wildlife • Measures to allow the collection of crops by farmers/landowners prior to landclearance by the Contractor • Measures to prevent nuisance from falling objects during transport • <p>The measures within the CESMP will reflect the approved Management Strategies and Implementation Plans approved as part of the tendering process.</p> <p>Note the Contractor is responsible for ensuring that the proposed measures will achieve the requirements of the contract. For example, if nuisance to communities, damage or pollution to the environment or property arises in the opinion of PMT or Supervising Engineer, the Contractor will be responsible for revising and implementing the new protection measures to bring the works back into compliance. The Contractor is responsible for ensuring the CESMP remains upto date with respect to revised measures, even if this requires review and update of the CESMP in accordance with PCC4.1.</p>	
General	<p>Before the start of any construction works, the Contractor will prepare and submit to the Supervising Engineer their Occupational Health and Safety Manual (OHSM) for undertaking the works. No works can start until the Supervising Engineer has confirmed that adequate protection measures are in place.</p> <p>In addition to the contents of the OHSM required by PCC4.8, the OHSM shall include:</p> <ul style="list-style-type: none"> • Main hazards that are predicted because of the works, an assessment of the risks and the mitigation measures to be provided to manage these risks. The mitigation measures shall favour in the following order: elimination; 	4.8

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	<p>substitution; engineering controls; administrative controls; PPE.</p> <ul style="list-style-type: none"> • Above the basic requirement of safety boots, high visibility clothing and hard hat, PPE shall only be accepted as a mitigation measure as a last resort. Where PPE is used, the standard and specification shall be set out in the OHSM, by reference to the ASTM, ANSI/ISEA or EN standard the PPE will meet • The measures to be taken to establish a good Safety Culture, including the management focus, attitude, commitment, and empowerment that will be provided • Measures for the safe movement of traffic (traffic management plan) to and from the Works, including measures to segregate vehicles from pedestrian movements, signage (including speed signs) and speed controls • Arrangements for the safe transportation of workers to and from the Works, including to and from local community centers, where workers are accommodated in local communities • Prohibition of the use of project vehicles or trucks to pick up and transport workers, unless that vehicle has been specifically tasked for the transport of workers, and is provided with seats and safety belts for all riders. • Prohibition of the use of project vehicles or trucks to pick up and transport anyone who is not an employee of the Project • Undertaking checks to ensure drivers of all vehicles have valid licences for driving that type of vehicle and are competent and adequately trained in driving that vehicle • Checks to ensure operators of heavy machinery have valid licences as required by law and are adequately trained and competent to operate the vehicles or machinery • All vehicles are maintained in accordance with manufacturers requirements and are in safe operating condition. Vehicles shall be fitted with flashing beacons and reversing alarms 	

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	<ul style="list-style-type: none"> • Ensuring all workers are properly informed of their rights and responsibilities related to OHS risks and management • The minimum contents of the worker induction to be provided to all workers, and the mechanism for recognizing that all workers have received an up to date induction prior to entering the construction site. The general induction shall be repeated annually for all workers. • The mechanism for briefing workers on the safety aspects at the start of each works activity, and for providing additional training to workers exposed to specific types of OHS risks beyond basic construction. • Contractors' proposals for monitoring health and safety performance during works, and for updating requirements should the performance fall short of contract requirements <p>As part of the procedures to establish and maintain a safe working environment, the types and locations of the necessary safety equipment, tools, and materials shall be provided, together with the type of worker safety briefings to be provided, and the safety supervision arrangements that will be provided.</p> <p>The Contractors Environment, Social and Health and Safety Specialists shall meet (at a minimum monthly or more often as required) with the Supervising Engineers Environment, Social and Health and Safety Key Personnel, to discuss the current performance of the works and to undertake joint inspections of working areas.</p>	
General	<p>Environmental protection measures to be provided by the Contractor shall ensure that any discharges to the environment because of the works will be within the limits set out in WBG EHS Guidelines^[1] or Malawian standards, whichever is the more stringent.</p> <p>There shall be no burning of wastes or wood/timber on site.</p>	4.18

[1]

https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
General	<p>An archaeological ‘watching brief’ shall be undertaken at the Client’s direction during land clearance and top soil strip. The Contractor will provide plans in sufficient detail to show the areas to be cleared and stripped, and an accompanying program of the phasing of the works; these shall be provided three weeks prior to the start of clearance works. The Contractor shall work cooperatively with the archaeological specialists in planning the supervision of the clearance and topsoil strip, and provide reasonable assistance (such as access to welfare facilities, permission to ride on staff transport to work sites) to the specialists to facilitate their work.</p> <p>The Contractor’s relevant personnel, to include the Environment Specialist and Workers involved in clearance and soil stripping activities shall attend training provided by the archaeological specialists prior to commencing works.</p> <p>In the event of artifacts being discovered during the works, the Contractor shall abide by the immediate instructions given by the archaeological specialists, and this may involve install fencing (or other such protective equipment) and temporarily ceasing work in the immediate vicinity while the archaeological specialists undertake their investigations. The Contractor will only be permitted to restart works in the protected area, once the archaeological specialists have confirmed that their investigations are complete.</p>	4.23
General	<p>Suppliers (other than Sub-contractors) of construction materials shall be subject to inspections by the Contractor prior to first use and at least every 6 months thereafter. The inspections shall check for forced labor, child labor and serious safety issues, and shall be provided to the Supervising Engineer as an annex to the Contractor’s monthly report for the month in which the inspection was undertaken. The Contractor shall provide a list of all suppliers of construction materials during each month.</p>	4.25
Impact 1	<p>Temporary crossings of rivers shall be constrained to straight stretches, and shall require the construction of a concrete ‘Irish crossing’ (see indicative design in Annex 4) to minimize damage to the banks and bed of the river. The concrete shall be removed upon completion of the works and the bed and banks of the river shall be restored to their former condition.</p>	4.18

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	Photographs of the location of each crossing shall be taken prior to works and submitted to the Supervising Engineer along with the Contractor's design for the Irish crossing. Upon completion of the works, the photographs shall be compared with the restored crossing points to facilitate the Supervising Engineers conformation of the adequacy of the restoration.	
Impact 2	Work in rivers and within 100m of rivers that are ephemeral shall only be carried out during the dry season, when the rivers are dry.	4.18
	Work in rivers and within 100m of rivers that are perennial shall only be carried out after measures have been put in place to prevent earth and all other materials from falling into the rivers. These measures shall agreed as part of the CESMP and may include the use of silt fences.	
	Refueling or maintenance of any vehicle, machine or equipment shall not occur within 20m of a river. Refueling bowsers and maintenance crews shall carry drip trays, absorbent mats and spill kits and shall be trained in the use of these materials to prevent pollution to land or water while carrying out their duties.	4.18
	Concrete wash water shall collected in impervious tanks and treated to ensure it does not change the pH or pollute land or water. With the agreement of the Supervising Engineer, upon exception concrete wash water from concrete pumps may be discharged to a part of the works site that will be affected by permanent works.	4.18
	All vehicles shall carry spill kits and first aid boxes.	4.18; 4.8
Impact 3	Areas of temporary landtake shall be restored upon completion of the works at that site to its former condition. The restoration shall be undertaken progressively, as the construction works are completed.	4.18
	Excavated soils shall be segregated into top and subsoils, and topsoils shall be stored in mounds no more than 3m high for subsequent use in restoration or for provision to local communities upon their request. Soil cannot be sold by the contractor to surrounding communities.	
	Stores of sub-soil shall be limited to those needed for the restoration of the works, and during restoration, the subsoils shall be laid below the topsoils (i.e. in the order in which they	

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	<p>were excavated) and no vehicles will be allowed to pass over the restored areas, once the top soil has been deposited and spread.</p> <p>The locations for the storage of sub-soils shall be agreed with the Supervising Engineer as part of the CESMP.</p> <p>Soils and excavated materials that are not used in restoration shall be disposed of at a disposal site to be agreed with the Supervising Engineer. shall not be left in mounds but shall be flattened at the end of construction and revegetated</p>	
	<p>The locations of Borrow pits and Quarries shall be agreed with the Supervising Engineer and in consultation with local authorities and local communities. Careful consideration will be given to minimizing impacts to local communities as part of their selection, including from dust, noise, blasting and vehicle movements.</p> <p>Borrow pits and quarries opened as part of the Works shall be restored as soon as they are no longer needed by the contractor and restoration proposals for each shall be agreed with the Supervising Engineer to ensure safety. No steep slopes (slopes shall not be steeper than 1:2.5) or areas of deep (>1m) water shall be left.</p>	4.8; 4.18
Impact 4	<p>As set out in Section IV of the Standard Procurement Documents, Bidders are required to confirm they will apply the provided Code of Conduct. For SVTP-II the Code of Conduct shall be amended to include the requirements that:</p> <ul style="list-style-type: none"> • The contractor/developer shall have and enforce an alcohol and drug-free policy (in the work place and while driving vehicles and machinery). • Workers and visitors should not make any disrespectful gestures or use any swearing words to anyone either in the community, or along the access road. • No unlicensed person shall drive work vehicles. Drivers shall be tested prior to starting work on the project, and have a valid license. International workers shall be responsible to provide a translation into English of their driver license. • Drivers shall follow designated routes that have been approved by the Construction Company and Supervising Engineer 	Section IV – Code of Conduct 4.25

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	<ul style="list-style-type: none"> • Workers and visitors shall drive slowly when passing through villages that are very close to the access roadside or pedestrians walking along the side of the road. • Drivers and passengers shall watch out for wild or domestic animals or people crossing the access road. In case of collision with any domestic animal, full compensation shall be paid in consultation with the village headman. • It is forbidden for any construction worker to purchase bush meat, any animal parts, any living animals or any mineral (gold, stones). It is forbidden to fish, hunt or engage in trading activities in or outside the Project area. • Wildlife capture, plant collection, or free-roaming pets (which could conflict with wildlife) is forbidden. <p>In addition, prior to the start of works that affects any village, PMT will introduce as a minimum the key staff members of the Contractor, including the Project Manager and Site Engineer, to the village headman to show his respect and present works and activities and to describe the safety risk.</p> <p>Induction training about sexual harassment shall be mandatory for all workers. During these induction trainings, the local law enforcement will be present to explain the national laws that make sexual harassment and gender-based violence a punishable offence.</p>	
	<p>The project's grievance redress mechanism shall be actively supported by the Contractor, to the satisfaction of the Supervising Engineer and PMT. The GRM allows the community to communicate with the construction contractor and project about their concerns and grievances, including regarding the behavior of workers. Contractors will provide a mailbox at the their camp sites to collect community grievances and provide a billboard close to the mail box so that communities can read answers from the contractor. The contractor shall attend meetings with village headmen and village community representatives as required, anticipated to be at the minimum once per month. The senior members of the Contractor team (including the Project Manager) will be expected to attend, as required.</p>	

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
Impact 5	<p>Considering the high local impact of the Project in terms of land and disruption of existing lifestyles, and further to the requirement of PCC6.1 the Contractor will be expected to preferentially recruit workers from the Lower Shire Valley, then from Malawi and then from other countries.</p> <p>The Contractor shall propose and agree the mechanisms by which it will advertise positions for Lower Shire Valley workers with the Supervising Engineer, within three months of contract effectiveness.</p> <p>There shall be no day employment of workers.</p> <p>In achieving the Contractor's equal opportunity policy, the Contractor shall target equity in the number of male and female workers employed.</p> <p>The Contractor shall report the numbers of staff, their gender, if they have a disability, and the location from where they are from each month in their progress report.</p>	<p>6.1</p> <p>6.25</p> <p>6.10</p>
Impact 6	<p>Before undertaking any blasting, the Contractor shall assess the risk to communities and infrastructures by doing a ground-truthing survey of wells, houses, churches, buildings, etc. Ground-truthing shall involve local authorities, Supervising Engineer and the PMT, and will require the contractor to obtain photographs of the condition of buildings and property that may be affected before and after blasting.</p> <p>The method statement for blasting will be approved by the Supervising Engineer and will include the contractor's arrangements for providing advance warning to the local population through radio, public posters, churches and local authorities, and their proposals for undertaking safety patrols immediate prior to blasting to ensure that all people are evacuated from the blast radius.</p> <p>Any damage that is caused to property will be repaired to the satisfaction of the Supervising Engineer within 3 months of the occurrence of the damage at the Contractor's cost. Repairs will be to achieve the former condition.</p>	7.5/7.6

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
Impact 7	<p>The Contractor shall undertake checks for objects of archaeological or cultural heritage interest during the works (and particularly during excavation works) and implement the Chance Finds Procedure included in the specification.</p> <p>The construction contractor must avoid construction-related impacts to known cultural resources such as graveyard, churches, etc.</p>	4.23
Impact 8	<p>The Contractor shall note that special arrangements apply for undertaking works within Lengwe National Park.</p> <p>The construction program through Lengwe National Park will be phased such that except for a haul road along the alignment and within the right of way of the canal, no open unfinished construction activity of longer than 1km will be worked at any one time. Although several stretches may be worked at the same time, for example to enable the construction of overpasses and underpasses, there shall be a gap of 1km between the areas of construction activity where only haul operations and vehicle movements between working areas will be permitted.</p> <p>Post construction soil rehabilitation, tree and shrub planting, and grass seeding shall be done progressively, as each working area is completed. The restoration proposals will be agreed for each section with DNPW, as part of a restoration plan prepared and submitted for approval within 3 months of the start of works in each section. The tree and shrub planting stock shall be collected from the DNPW tree and shrub nursery by the Contractor for planting. Only species of local provenance will be accepted as part of the restoration proposals for the national park.</p> <p>Workers shall be transported in buses from the entrance of the park to working areas. There shall be no walking between construction areas within Lengwe National Park.</p> <p>Welfare facilities shall be provided in association with the working areas. These shall comprise; rest areas; canteen/eating areas; hand washing facilities; latrines. Latrines shall not be pit latrines, but of the 'portaloo' type so that all materials are carrying in and taken out of the park, and nothing is left in the park.</p>	4.18

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	<p>Construction vehicles shall access the construction areas only along the alignment of the canal, and not use any of the existing roads within the Park (except where these also follow the alignment of the canal). All vehicles entering the park will be cleaned of all mud and earth, to prevent accidental transport of invasive species of plant</p> <p>The boundary of each construction area will be marked by temporary fencing such that it is clear where the boundaries of the working area are: no works shall occur outside of these boundaries and no materials will be stored or allowed to spill beyond these areas. No workers will be allowed to stray beyond these areas.</p> <p>The temporary fencing design and location shall be agreed with DNPW and the Supervising Engineer, and will be wildlife approved and electrified.</p> <p>Non-electric temporary fences suitable to prevent incursion by workers will be established around excavations. Temporary fencing shall also be used around stores of materials (including any hazardous materials and wastes) to prevent access and minimise the chances of the wastes dispersing into the park.</p> <p>No construction camps will be constructed within the National Park.</p> <p>No materials or equipment shall be left in the Park overnight, except that which are stored in locations on the site agreed with DNPW and approved by the Supervising Engineer. These locations will not be where the alignment passes through or close to 'the thicket'. Materials or equipment left in the park shall be in a single location and surrounded by a fence that prevents wildlife access.</p> <p>No refueling of vehicles shall occur in the Park, except in designated refueling areas approved by the Engineer. Designated refueling areas shall be equipped to ensure no fuel contamination of ground, water or vegetation can occur, and to ensure the immediate and effective clean-up of any spills. No fuel bowsers shall be stored in the Park.</p>	

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	<p>Irrespective of any indications on contract drawings, the Contractor shall demonstrate measures to reduce the footprint of temporary works to the minimum required; the Supervising Engineer will be required to agree that the footprint has been reduced to a practicable minimum.</p> <p>Temporary construction roads and tracks shall be limited to immediately adjacent site along the canal in the predefined footprint (10m) from the canal path, these roads and tracks shall be restored to their former condition upon completion of construction.</p> <p>All trees and shrubs in the Park shall be cut by hand prior to clearance, under the supervision of DNPW. Workers involved in the cutting of vegetation shall be trained to identify the presence of wildlife in any vegetation prior to cutting, to include the presence of nesting birds. Trees containing wildlife will not be cut, until an Environment Specialist has confirmed that the vegetation can be cut without impact.</p> <p>Vegetation clearance shall be limited to the permanent footprint of the canal, plus a 10m working width either side. Cleared vegetation shall be removed from the park, unless agreed otherwise with DNPW. This may require some vegetation, including tree wood, to be transported to Nyala Lodge.</p> <p>All fueled equipment, machinery and vehicles in the Park shall be accompanied by a spill kit comprising adequate clean up materials for any spills that may occur.</p> <p>Waste collection areas shall be provided at every works area, and shall be emptied daily.</p> <p>No fires shall be permitted in the park.</p> <p>Regular sensitization induction training will be provided to all workers engaged in construction activities in the National Park. The sensitization will explain the rules of working within the park, and reminds workers of the need to respect working boundaries (not to leave the worksites and stray into the Park) and wildlife within the park, as well as the health and safety requirements for undertaking their duties. No hunting of any sort</p>	

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	<p>will be permitted by any staff in the park, and intentionally causing harm/injury to any animal or polluting any part of the park, as well as damaging any vegetation outside of the working area will be reported to the relevant authorities and result in dismissal from the contractor’s workforce.</p> <p>All workers will be provided with identification badges, which shall be shown to security prior to admission to the park. The identification badge shall indicate that the date on which the worker received the induction for working within the park. Any workers without a badge or who have not received the induction within the last 6 months will be forbidden to enter parks. Workers cannot spend the night in the Park.</p> <p>All workers shall be trained in the use of spill kits to clean up spills of fuels, oils, or other chemicals and hazardous materials. All workers shall be informed of the need to prevent spreading of litter in the Park. The Contractor shall develop and implement an incentivization scheme for workers to clean up spills and avoid waste deposition in the Park.</p> <p>All equipment, machinery and vehicles that enter the park shall be fitted with silencers and other noise minimizing devices as specified by the manufacturer. These devices shall be maintained in accordance with manufacturers requirements for the duration of the works.</p> <p>Blasting, piling or other noisy activities shall not occur on Weekends or on Public Holidays. Whenever blasting will be used, the best method must be used and arrived at in consultation with the Supervising Engineer. An example of such method is “precision rock blasting” in which cartridges are introduced in drill holes. This technic leads to minimal vibration, noises and flying debris. Blasting shall be restricted to between the hours of 11am and 2pm. Other noisy operations shall be restricted to between the hours of 9am and 5pm.</p> <p>Spraying vinasse (for example for dust suppression) will not be accepted within Lengwe National Park.</p>	

Measures to be included in Environmental and Social Specification		
Impacts	Measures to include	Relevant GCC/PCC
	<p>The Works shall be completed within the timeframe allowed in the Contract; delays that are the result of the Contractor shall incur compensation payments to DNPW for the additional disturbance.</p> <p>All reserve infrastructure shall be assessed prior to machinery deployment. Ground-truthing site visit(s) with DNPW and the contractor shall be done to ensure that the contractor repairs any and all damages to roads, water boreholes, buildings, fences, etc. Pictures shall be taken to assist the ground-truthing visit. The main roads to LNP, campsites, quarry site and construction sites as well as the roads within LNP, shall be inspected prior to construction by DNPW, the contractor and Consultant to determine their baseline status and to inform any damages that are incurred during the construction process (e.g. caused by the great number of trucks that will use this road).</p>	

5.2 Supervising the Construction Contractor Performance

The PMT will be responsible for appointing and Supervising the work of a Supervising Engineer during the Construction Works.

5.2.1 Supervising Engineer

All contractual measures related to delivering the ESMP (including the implementation arrangements described in the CESMP and OHSM) shall be monitored on a day to day basis by the Supervising Engineer. The following requirements will therefore be included in the Supervising Engineers Bid Documents.

The Supervising Engineer will be required to provide adequate numbers of environment, social and health and safety specialists to supervise the contractor's compliance with the E&S Requirements. The Supervising Engineer will be required to provide full time environment, social and Health and Safety Specialists with the following qualifications and experience:

<i>Specialist</i>	<i>Minimum Qualification</i>	<i>Minimum Experience</i>
Environment Key Expert	Degree in Environmental Management or other Natural Resources related topic	5 years' experience of implementing and 5 years' experience of supervising environmental aspects of linear infrastructure construction

		works. Familiarity with legal environmental requirements in Malawi and demonstrated experience of delivering best practice measures in countries of low capacity.
Health and Safety Key Expert	Degree in HS related field NEBOSH General Certificate Or International qualifications from IOSH Member of professional body (for example IOSH)	5 years' experience of managing and 5 year's experience of supervising health and safety during linear infrastructure construction works. Familiarity with legal health and safety requirements in Malawi and demonstrated experience of delivering best practice safety measures in countries of low capacity.
Social Key Expert	Degree in Sociology, Gender , Development studies or a relevant degree of comparable relevance Membership of relevant professional body will be an advantage	5 years' experience of managing and 5 year's experience implementing social safeguards. Familiarity with legal social, gender and youth requirements in Malawi.
GBV Key Expert	Degree in Sociology, Gender , Development studies, Security studies or a relevant degree of comparable relevance Membership of relevant professional body will be an advantage	5 years' experience of managing and 5 year's experience implementing GBV actions and advocacy.

For supervising the works through Lengwe National Park, the Environment Key Expert will also require experience of supervising construction activity within sensitive ecological sites, including protected areas.

These specialists will be supported by EHS Inspectors in adequate numbers to ensure that all work areas can be supervised. The Key Experts and EHS Inspectors will each be provided with a car and fuel, to ensure that they can undertake their duties.

In addition to the requirements of the Terms of Reference set out in the World Bank's Standard Procurement Document for Consulting Services (Supervision) April 2021, the Key Experts will be required to review, approve and supervise the implementation of Method Statements/Safe Systems of Work, and provide advice and guidance to the contractor as necessary to ensure that best practice safety measures are implemented.

The Supervising Engineer's Environmental, Social and Health and Safety Key Personnel shall also be required to meet regularly (monthly or more often as necessary) with the Environment, Social and Health and Safety Specialists from the contractor regarding the performance of the works, and to undertake joint inspections of the works areas. The PMT Environment and Social Specialists will attend these meetings. When works take place within LNP, the DNPW shall also be part of these monthly meetings. Similar meetings shall be required for GBV Specialists, law enforcement agents and GBV Service Provider.

Site visits by the Supervising Engineer will focus particularly on the following sites, although visits to the Contractor's primary suppliers will be undertaken from time to time in addition:

- Lengwe National Park;
- Quarries and borrow pits;
- Construction sites;
- Contractor's campsites

The Supervising Engineer shall report to the MoAIWD (Ministry of Agriculture, Irrigation and Water Development) all environmental, social, and health and safety issues related to the construction contractor as part of their monthly progress report.

Non-compliances with the E&S Requirements, should they be identified during the Supervision, shall be processed in accordance with the Contract, and reported as part of the monthly progress report. If not bought back into compliance, remedies shall be applied as set out in the Contract. Remedies shall include:

- Withholding of payment from IPC of a sufficient amount to incentivize the contractor to comply (GCC/PCC14.6)
- Removal of personnel who persist in behaviour detrimental to the environment or safety (GCC/PCC 6.9)
- Instructing another to undertake the works at the Contractors Cost (GCC 7.6)

5.2.2 Regulatory Authorities

At the request of PMT and in accordance with their statutory duties, the regulatory authorities will undertake inspections from time to time. This will include:

- Ministry of Environment and Natural Resources, who is empowered to ensure that regulation with respect to the Environment is being complied with, including the statutory ESIA's and ESMPs

- Ministry of Labor who is empowered to ensure that labor and health and safety regulation is being properly applied.

These agencies will not only inspect during the construction works, but shall also undertake inspections during the operation of the farms and canal infrastructure.

The following figure summarizes monitoring of the construction contractor.

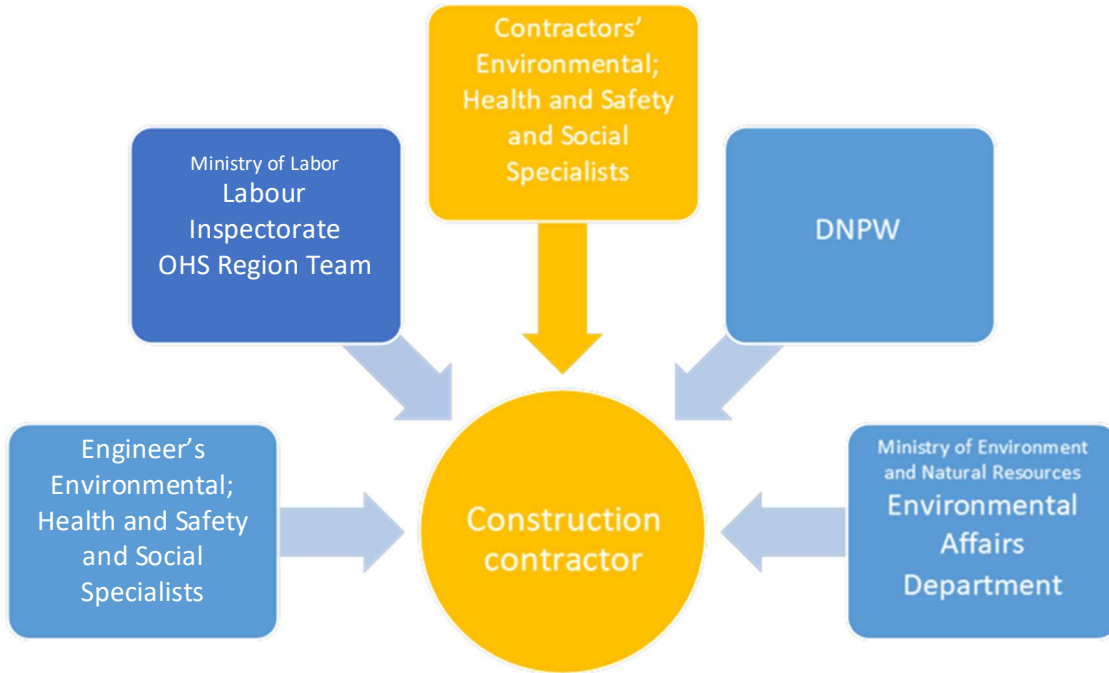


Figure 2: Monitoring of Construction Contractor

5.2.3 Performance Indicators

The number of non-compliances on contractual measures, including compliance with legal requirements, will be the main performance indicator for construction and operation. Measures described in the Contract will be used to develop a wide range of other proactive and reactive indicators for monthly progress monitoring; these measures are straightforward and do not leave room for much interpretation.

5.3 Compliance during Operation

5.3.1 Commercial Farms

During the establishment of the Command areas, the SOCFEs will be provided with consultant support through a SOCFE Development Service Provider and through Agricultural Commercialization Technical Assistance. The consultant support will assist in the preparation of business plans that will help the SOCFEs identify the necessary farm investments to be implemented. The Terms of Reference for the

consultant support requires the consultant to ensure that business plans take into account the requirements of the PMP and the need to ensure good occupational and community health and safety practices.

The business plan will be used by the SOCFEs during the application for financing for the works. An Investment Assessment Panel (which contains specialists appointed by PMT, including those with commercial, agronomic and irrigation experience) will review these against the Criteria contained in their Terms of Reference, including that the business plans have allowed for Pest Management Plan, Waste management and resource-use efficiency measures.

In addition, SOCFEs will employ a Farm Manager to organize farm operations. The Terms of Reference for the Farm Manager will require the following while assisting the SOCFEs prepare their operation plans:

- Integrate requirements of PMP into farm operations.
- Establish health and safety procedures for farm workers to ensure farm operations do not present a risk to farmers or neighboring communities.
- Formulate waste management procedures, including for the transport, storage and disposal of hazardous materials
- Foster collaboration with other livestock and smallholder farmers with respect to use of crop residues, manure, and livestock feed and passage.
- Once the full soil surveys are available, land that cannot be farmed shall be designated as grazing areas, woodlots, or other non-irrigated lands.
- Water and energy resource efficiency measures.

The PMT will provide guidance and training on the ESHS risks and issues that the consultant support should consider when identifying mitigation measures. PMT will undertake visits and reviews from time to time of farm enterprises to ensure the farm operation plans are established and implemented in accordance with this guidance. The PMT may advise on changes or updates on the operation plans to ensure that they are appropriate and effective.

5.3.2 Canal Infrastructure Operator

As part of the tender documentation, the Canal operator will be required to develop within 6 months of award an Environmental Management System in line with ISO14001, a Health and Safety Management System in line with ISO45001, and a Social Responsibility Management System in line with ISO 26000. A risk assessment will be undertaken to inform the preparation of these management systems, during which environmental receptors and health and safety risks will be identified and measures introduced into management operations to ensure the safe operation of the canal infrastructure without damage to the environment or neighbouring properties.

PMT will be responsible to ensuring that these systems are developed and implemented and have considered the operational mitigation requirements set out in the ESIA.

The contract with the Operator will reflect agreements reached with African Parks (regarding canal infrastructure that is within the Majete Wildlife Reserve) and DNPW (regarding canal infrastructure that is within Lengwe National Park) for access to and maintenance activities associated with the canal.

In addition to operating and maintaining the canals, key responsibilities of the Operator will be to maintain the canal infrastructure and RoW, the pedestrian and cattle bridges across the canals, as well as the safety stairs. In Phase II, the operator will also be required to maintain the canal infrastructure within Lengwe National Park (including the structural integrity of the overpasses and underpass), and prior to doing so, seek DNPW prior approval of the works to ensure minimal disruption to wildlife and tourists.

The canals shall remain part of the LNP and the right-of-way of the canal shall not be alienated from LNP. Access to the intake and canals for maintenance will be managed in accordance with DNPW access restrictions (and inspection to avoid poaching). This means that there shall not be any independent access gate to canal maintenance road inside LNP. Recognising the presence of dangerous animals within the Park that may be attracted to the canal, the Operator shall develop and agree an access protocol with DNPW such that staff are accompanied by rangers when working in the park. The costs of this will be born by the Operator.

6. INTEGRATING MITIGATION INTO THE DETAILED DESIGN

This section describes the mitigation measures that will be integrated into the final design of the civil engineering works for the canals, associated infrastructure, including command areas. It considers aspects to form part of the canal infrastructure design for construction, as well as aspects related to the fine tuning of the command areas, for example to safeguard natural habitats and maintain other needed non-irrigated lands.

The PMT Procurement Specialist is responsible to include these measures in the designer's contract, and it is the responsibility of the PMT Engineer, Environment and Social Specialists to ensure that the final design meets the stated requirements. In order to ensure that the designer is fully aware of all requirements, the designer shall be required to prepare and submit for PMT's approval an Environmental Design Management Procedure prior to starting works.

The Environmental Design Management Procedure shall describe the designers review process, and the hold points during which design reviews will be undertaken. It will also tabulate all of the design related commitments from the ESIA and this ESMP, and indicate into which design drawings the commitments will be incorporated. The Designer shall have on their team an Environmental Specialist and an Health and Safety Specialist and these specialists shall be an integral part of the design team, briefing the designers on the requirements, assisting the designers as necessary and reviewing the designs to confirm that the commitments have been met and included in the final design.

6.1 Fine-Tuning the Command Areas to benefit the communities and the environment

Under SVTP-II, the location of the command areas will be optimized in consultation with the local communities, as happened on SVTP-I as part of the design development process. During this process the non-irrigated buffer zone around the edges of the Lengwe National Park will be maintained to help prevent encroachment upon the park and to reduce human-wildlife conflicts.

The command areas include all of the lands needed for the operation of the farm, and as such will also include Set-aside Lands that shall not be irrigated. These include (i) pre-identified areas comprising the remaining natural habitats (riverine forests, thickets, dambo wetlands, etc.), frequently flooded areas, soils unsuited for irrigation, cultural heritage sites, and a hundred-meter non-irrigated buffer zone around Lengwe National Park and (ii) woodlots, grazing lands, and other special-use areas that will be identified during the participatory land use planning process that will be part of irrigation block establishment.

Avoiding the irrigation-related clearance of the very limited remaining areas of natural habitats (outside of protected areas) will comply with the Lender's requirements, while enhancing environmental outcomes. This will be achieved with the assistance of the SOCFE Development Service Provider, Agricultural Commercialization Technical Advisor and the Farm Managers, who will have clear TORs to consider ESHS issues. In addition the screening process described in Annex1 will apply.

The non-irrigated set-aside lands will also include areas that are needed as woodlots or grazing lands, to adequately meet the needs of nearby human populations and thus reduce encroachment pressures on protected areas to obtain fuelwood or construction materials, or to feed or provide a passage corridor for livestock. These non-irrigated set-aside areas will be spatially contiguous where feasible. The adjusted net irrigated area that SVTP is expected to achieve at full development excludes all these types of set-aside lands.

Irrigation command areas can form vast, contiguous patches of land that can block access by herders to traditional grazing areas. It will therefore be important to designate livestock movement corridors so that herders can access grazing lands, including to the edges of the Elephant Marsh. This will not only reduce the risk of conflicts between farmers and livestock owners but also the risk of conflicts with people living in urban place (Nchalo, Ngabu, Bangula). At this stage, the specific location of designated livestock movement corridors (as a type of non-irrigated set-aside land) is not known, but the Detailed Design study shall take integrate this measure into fine-tuning of the Command areas.

Setting aside land as an environmental and social mitigation measure will not necessarily imply that irrigated land will be lost, as the limiting factor is water not the available land. However, it will allow the Detailed Design study to fine-tune each command area, taking into account these sensitive areas and to study the possibility to expend the irrigated land in areas with lesser value. The Set-aside Lands Map on the following page shows the location of some of the lands within irrigation command areas that will be set aside and not irrigated. These lands include:

- Valuable open woodlands cover about 720 ha of the command areas of Phases I and II (this figure does not consider small patches of woodland); these shall be set aside.
- In Zone A, 34.5 ha of a marsh called Thanda Marsh and an unnamed grazing area of 29 ha shall be set-aside as well.
- Among the estimated 4,000 ha of heavy vertisols , some 2,000 ha are well delineated in Zone C. These lands will be set aside if they are evaluated to be poorly suited for the expected irrigation practices.
- About 430 ha of land are regularly flooded in Zone B along the Nkombedzi Wa Fodya River; this land shall also be set aside.
- All riverbanks shall be protected in the entire command area with an additional buffer zone of 100 meters.

Table 5: Set-aside lands and their coordinates

Land cover type	Command areas	Aproximate area (ha)	Coordinates at center point	
Open woodland (including riparian forest)	A	161	16° 9'10.32"S	34°41'37.57"E
	A	181	16°10'45.27"S	34°42'47.87"E
	A	20.8	16° 9'52.92"S	34°45'43.90"E
	I 1	67.7	16° 9'11.77"S	34°47'30.46"E
	I 1	43.9	16° 8'28.80"S	34°48'12.87"E
	B (Phase II)	88.8	16°20'3.82"S	34°48'44.36"E
	C (riparian forest) (Phase II)	12.8	16°24'56.49"S	34°53'11.25"E
	D (contiguous to Nyasa private wildlife reserve beside Kaombe sugar estate) (Phase II)	144 (this surface is the part of woodland beside Nyasa that is affected by the command area)		16°34'1.72"S
Marshes and flood prone area	A (Thanda marsh)	34.5	16°11'18.37"S	34°43'33.83"E
	B (flood prone area)	429	16°17'15.91"S	34°51'34.33"E
Heavy vertisols	C (Phase II)	1477	16°29'25.71"S	35° 0'5.69"E
	C (Phase II)	672	16°26'52.11"S	34°57'39.14"E
Grazing area	A	27.8	16°11'16.46"S	34°46'7.11"E
Rivers	Everywhere	141.8 + 100 meter buffer zone on both banks		

6.2 River Training Work

The design of river crossings will take into account the mobility of the river, to avoid having rivers shifting and no longer flowing through culverts or crossings. Therefore, design of the river crossings may require installing gabions or riprap on riverbanks to train the river towards the crossing.

To minimize damage to the terrestrial and aquatic natural habitats associated with the area's seasonal rivers (which flow into the Shire during the wet season), the designer will ensure that river training works are only provided where essential, for example for the shortest possible lengths at the canal crossings or where it is required to protect existing infrastructure. They shall not be used to make frequently flooded lands irrigable.

Wherever possible, crossings of rivers will not occur where the river meanders, but where it is flowing in a straight line.

When fine tuning the command area in the Design phase, it is recommended to avoid developing irrigated fields too close to any river and to take into account river mobility. SVTP irrigation development will avoid all areas that are in the 1 in 10 year floods of rivers and will not stabilize sharp

meanders with gabions and riprap. These important aspects shall be taken into account to safeguard rivers from being channelized and to protect croplands from frequent flooding.

In particular, modification of Nkombedzi Wa Fodya (a river that marks the limit of LNP) should be avoided. This river already causes floods at LNP (flooding of offices and lodges), so any channelization upstream of LNP would likely exacerbate the damage to LNP facilities.

6.3 Buffer Zones around Lengwe National Park and Encroachment

This ESMP requires that SVTP irrigated fields can not be located within 100 meters LNP or the Nkombedzi Wa Fodya. Zone A and B shall be designed to leave a non-irrigated buffer zone between the park and the scheme at least 100 meters wide.

6.4 Crossing Structures at Tributary Rivers

It is important to design culverts that allow for hydraulic transparency and fish movement. As presented in the ESIA, canal crossings of seasonal rivers should be super-sized to enable wildlife passage and minimize any risk of flooding of the main canals. The Q100 (potential 100-year flood) shall be taken into account to select the dimension of culverts and other river crossings during the Detailed Design study.

The estimates of the frequency peak flows for the sub-basins of right-bank tributaries intersecting the SVTP canals are given in the table below (calculations based on the flood frequency relationship established by Mkhandi & Kachroo, 1998). Based on these data, culverts and under passages have to be carefully designed.

Table 6: Peak flow of right bank Shire tributaries

Tributary rivers name	Catchment Area at SVTP Canal (km ²)	Peak flow(m ³ /s)				
		Q2	Q10	Q20	Q50	Q100
Mwanza	1621	112	304	377	467	535
Nkombedzi Wa Fodya	418	62	168	209	259	297
Namitalala	65	28	75	93	116	132
Phwadzi	219	47	127	158	196	224
Namikalango	140	39	105	130	161	184
Nyakamba	78	30	81	101	125	143
Mikombo	47	24	65	81	100	114
Mafume	61	27	73	90	112	128
Lalanje	77	30	81	100	124	142

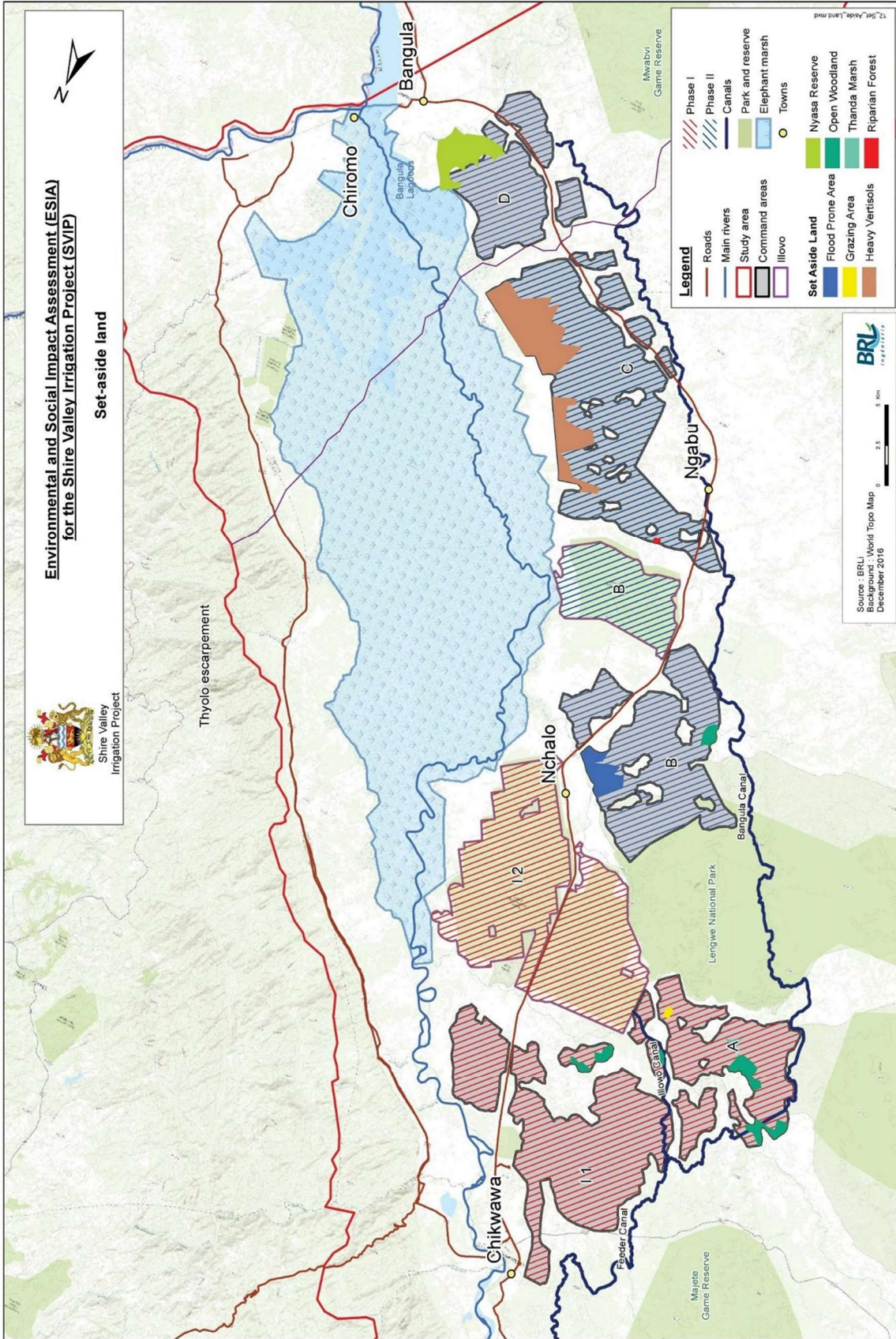


Figure 3: Set Aside Lands

6.5 Anti-Drowning Infrastructure

The detail design shall be reviewed by a safety specialist on the design team, to ensure that safety has been considered and appropriate measures to minimise risks to the workforce of the canal operator and the farms, and to minimise risks to the community. A key risk is the risk of drowning.

Large concrete stairs shall be included in the design for construction at each village crossed by a Main Canal (Feeder and Bangula). The primary purpose of these stairs would be to allow people to access water without undue risk. These stairs shall be large enough so that people can use them to fetch for water and clean their clothes (about 10 meters wide). An estimate, based on density of villages around main canals, is that a minimum of 30 stairways will be needed for Phase 2 (15 on the western bank and 15 on the eastern bank). Stairs shall not be designed so that they occur on opposite side of a canal at the same location, since this could be interpreted as an invitation to cross the canal (especially at times of low flow), and may increase safety and health risks to the local communities. Stairs should only be built at the village level, to maintain a certain level of control over the use of canal.

To reduce the likelihood of drowning, fixed 'ladders' that will allow people to climb out of the canal shall be designed for installation every 500m on each side of the canal. The 'ladders' shall be alternated (so they are not opposite each other) along the full length of the open sections of main canal. Fixed ladders shall be installed in night storages.

Since iron ladders may be stolen, alternatives to iron should be considered during the Detailed Design study, such as materials embedded in the concrete lining. Care shall be taken to ensure the design does not lead to pools of stagnant water.

Night storages shall be fenced, to minimise the chance of access by people or animals. Fencing shall also be incorporated into the design wherever the safety specialist has identified an unacceptable level of risk, for example if the canal passes close to play areas of schools.

6.5 Canal Crossings and Cattle Troughs

The Detailed Design study shall incorporate the following types of human and animal passageways across the Main Canals:

- Super-sizing box culverts (Q100) so that they also allow for the passage of cattle and wildlife under the canal, for most of the year.
- Road bridges where required to maintain continuity of routes; the estimated number is 10 tarred roads and 57 gravel roads for SVTP, of which 9 tarred and 33 gravel roads are within Phase 2. These shall be dimensioned commensurate with the existing roads and include parapets as necessary to maintain safe passage.
- Pedestrian bridges across the main canals (and branch canals) as needed to maintain continuity of official footpaths. It is estimated that 17 footbridges shall be provided for SVTP, of which 9 will be in Phase 2.

- Cattle bridges shall be incorporated into the design for every km of the main canals. SVTP will require 133 cattle bridges, 45 will be in Phase 1 and 88 in Phase 2. Cattle bridges shall be sufficiently wide to allow the passage of two cows, and have high parapets to prevent cattle from jumping into the canal.
- Cattle troughs shall be included in the design, such that there is one cattle trough at each village location. For Phase 1, 10 cattle troughs (5 on each side) are estimated and for Phase 2, 30 cattle troughs (15 on each side of the main canal) are estimated. Cattle troughs shall be lined with concrete (with a geomembrane to limit seepage) and shall be 5m in diameter and have a depth of 0.5m. The edges of the troughs shall be sloped to assist access.

6.6 Specific Measures for Lengwe National Park

Recognising the impact of the canal on Lengwe National Park, the detailed design for the 13km of canal alignment through the Park will be given special attention by the Designer’s team. The Design will adopt unique and special characteristics as necessary to meet address the key impacts described in the table below and ensure the impact of the canal on the national park is minimized.

Mitigation Measures for Lengwe National Park to be incorporated into the Design for Construction		
Key impacts (as described in ESIA)		Significance
Impact 1	Loss of Critical Habitat and fragmentation: The canal could impact the thicket, which is critical habitat. The canal could also bisect the park, cutting off the water rich eastern from the dry western part of LNP. The wildlife in the western part of LNP will need access to water and measures must be put in place to address water shortage.	Major
Impact 2	Drowning hazard for wildlife: open canals represent a drowning hazard for wildlife	Major

Canal Alignment

The alignment of the canal through Lengwe National Park will be optimized to avoid (minimize) the loss of thicket habitat. In order not to preclude any alignment options in Lengwe National Park, the end point for Phase 1 has been carefully selected. The canal shall remain part of the LNP and the right-of-way of the canal shall not be alienated from LNP.

Canal Lining and cross section

Canal construction and operation will fragment wildlife habitat in Lengwe National Park, and form a barrier for the movement of species. The sides of the canal will therefore be of a gentle gradient (maximum gradient will be 1:2.5) and either earth lined or lined with ‘armourflex’ style concrete lining, whereby animals will be able to gain traction on the banks.

Overpasses and Underpasses

To minimise fragmentation, dry crossings shall be provided across the canal. A minimum of 6 crossings will be provided. Overpasses shall be suitable for all types of wildlife (including elephants) to pass across the canal without entering the water and comprise shrub/savannah habitat. These may be combined with road crossings and are expected to be in the order of 50m wide. Underpasses may be combined with river crossings, but they shall be oversized and incorporate habitat that will remain dry, even when the river is flowing. Approximate locations for the overpasses and underpasses are shown on figure gg.

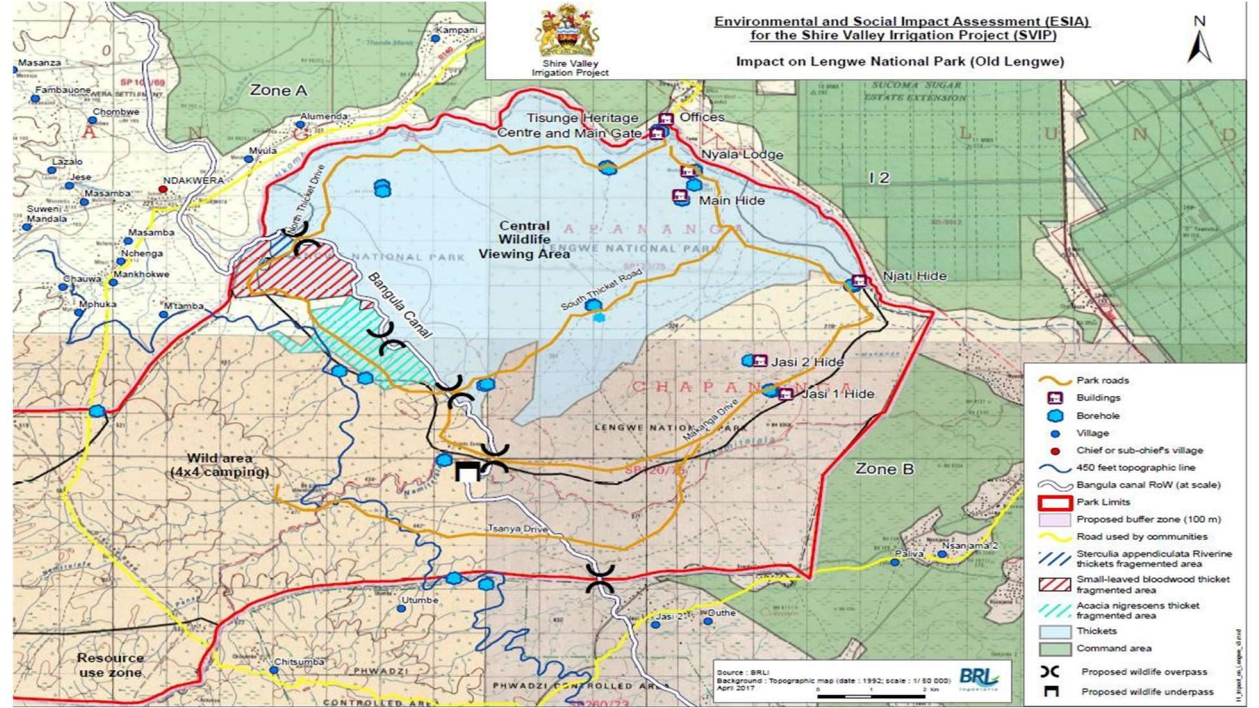


Figure 4: Map showing proposed crossing points in Lengwe National Park

Other Measures

In addition, other measures to be integrated into the design development to minimise the impacts of the canal infrastructure on the Park, including:

- provision of a minimum of 10 waterholes (solar panel operated or fed by water from the canal) on the western side of the canal and one wetland on the eastern side
- habitat enhancement measures in parts of the park that are currently of sub-optimal value for wildlife, as agreed with DNPW
- fencing of the boundary of the Park, including at the canal entrances to the park to prevent access from outside of the park along the route of the canal, as agreed with DNPW
- improving existing and providing new facilities such as camps, roads, etc. for rangers and scouts, to assist in the patrolling and security of the Park. Three new ranger camps (each with 6 duplex buildings) are to be provided. The measures are to be developed with DNPW.

A key aim of SVTP will be to assist Lengwe National Park address some of the issues that are affecting the wildlife use of the park, including availability of water, poaching, human encroachment, and lack of infrastructure. Therefore the other measures to be taken forward will be aligned with the management objectives for the park (as described in Lengwe National Park – General Management Plan 2021- 2025 prepared as part of SVTP-I).

6.6.1 Biodiversity Management Plan

The measures incorporated into the design, as well as the measures incorporated into the construction contracts will be fully described within a Biodiversity Management Plan for Lengwe National Park. This will be prepared by PMT during 2022 and submitted to World Bank for no objection prior to the start of construction activity through Lengwe National Park.

The Biodiversity Management Plan (BMP) will be prepared prior to preparing the tender for the Contractor for working through Lengwe National Park, and this BMP will include details of the mitigation and compensation measures to be provided by the project. As a minimum, the measures to be described in the report will include:

- details of a tree survey of the final alignment together with proposals for the sensitive removal of the trees, ensuring the value of the timber is retained for management activities in the National Park
- details of the vegetation and habitat types that will be affected by the canal
- a monitoring program for wildlife in the park
- details of how the route alignment has been optimized to avoid and minimize impacts to the thicket
- details of the overpasses and underpasses provided, including how their suitability for wildlife to pass across the canal without entering the water has been ensured
- details of the slope angle and canal lining that has been adopted through Lengwe National Park and why this is optimal for the wildlife in the park
- the number and location of waterholes, together with their design
- the location and design of the wetland
- restoration details for the temporarily used parts of the Park
- details of the habitat enhancement measures to be undertaken in other parts of the park, to improve their value for wildlife
- the design for the fencing of the canal where it enters and exits the Park, and how this will prevent access from outside of the park along the route of the canal
- the location and details of the facilities (camps, water, roads etc.) for rangers and scouts that are to be provided.

6.7 Permanent Loss of Buildings and Community Infrastructure

As mentioned in the Resettlement Policy Framework, a number of locations where impact of the canal can be reduced considerably without any additional construction work was identified during Phase 1. Changes to the design were proposed to avoid village areas and graveyards as much as possible. The result of the proposed changes was a reduction of affected villages from 19 to 6 and affected houses

from 121 to 26 in Phase 1. As part of the detailed design development for Phase 2, a similar optimization study will be undertaken and built into the Environmental Design Management Procedure. The RAP will describe how any remaining impacts to infrastructure will be compensated, once the detailed design is finalized.

6.8 Avoidance of Cultural Heritage Sites and Features of Archaeological Interest

A number of methods may be implemented to avoid direct impacts to a cultural resource, but avoidance of important sites is generally the preferred option. If a site cannot be avoided then steps will need to be designed to reduce direct impacts. Depending on the context, avoidance, relocation, intentional site burial or data recovery may be most appropriate solutions.

Avoidance is one of the primary methods to mitigate direct impacts to important cultural resources. In the case of this Project, avoidance of impacts can often be most easily accomplished by adjusting or rerouting the project activity, if possible, to outside of the boundaries of the cultural heritage resource. For instance, all sacred sites as well as cemeteries that have been identified have been classified as 'High priority sites and have been avoided (see ESIA and PCCPLTRPF).

Intentionally burying sites under protective cover can also be an effective protection technique. Depending upon types of artifacts present, existing soil characteristics (*e.g.*, pH characteristics and intensification of wet-dry cycles) burial can often provide protection from the compression effects of heavy equipment. Looting potential is also reduced. When a site is buried, soils used to cover the site should be free of artifacts. Occasionally a soil with a distinctive color (*e.g.*, sand) is placed over the site and then the major fill. This permits future removal of the fill if needed, and a method to distinguish, at least for a period of time, the fill soils from the natural surface. Prior to burial, diagnostic artifacts are often collected from the surface of the site. Other types of artifacts may be collected if the site is to be permanently buried. Covering a property with surface features is generally not appropriate.

During the design development, the Designer will be required to take note of the features of cultural heritage and archaeological importance identified in the ESIA, and wherever possible design the works to avoid the features of high priority. Where these are not possible to avoid, the Designer, in consultation with the MDOA and the local community, will propose the most effective course of action, for example, investigation and excavation in advance of construction or surveillance by specialists during construction activity.

The appropriate course of action will comply with defined national or local cultural heritage regulations and protected area management plans (where these exist). Key considerations prior to proposing removal of features of cultural heritage or archaeological importance are:

- how the material should be handled;
- who should be involved or present during the relocation processes;
- what, if any, ceremonies should be performed and who should perform these;
- where should the features be relocated to; and
- how they should be managed in their new location.

The Designer shall ensure that this information is provided timely to enable the proposed course of action to be taken, in advance of construction activity.

7. COMPENSATION FOR LENGWE NATIONAL PARK

The project is anticipated to have impacts that are either economic or that can only be mitigated by actions taken by DNPW. As such these mitigation measures should be addressed through providing compensatory payments to DNPW for undertaking these tasks. This section describes the compensation funds that will be provided to DNPW directly, and the tasks that DNPW will undertake using those funds. All mitigation measures in LNP were arrived at in consultation between DNPW, PMT and World Bank mission.

Costs are based on a two-year construction period. If the work takes longer, some adjustment will be needed. The main risk for DNPW would come from delays in work completion, as some mitigations are time related (especially the loss of business revenues). Any delays past the foreseen schedule may not have been budgeted in the compensation package. It is therefore important that sufficient fund be provided in case of delays.

Compensation Plan for Lengwe National Park		
This compensation plan concerns activities that do not relate to the construction contractor or detailed design		
Reminder of impacts (from ESIA)		Significance
Impact 1	Impact on tourism and revenue generation: construction activities in LNP will have deleterious impacts on tourism. The construction works will cut off access routes by tourists and game, a development that may lead to reduction in revenue generation from LNP by DNPW	Low
Impact 2	Increase in wildlife illegalities The opening of the canal along the 14 km stretch in LNP will avail poachers and illegal loggers an open access into the park and sites where game cross	Major
Impact 3	Security of construction workers: with the canal passing through LNP, security measures for construction workers will have to be constituted so that wildlife do not pose risk to workers' life	Major

Compensation Plan for Lengwe National Park

This compensation plan concerns activities that do not relate to the construction contractor or design solutions

Compensation 1

SVTP shall pay DNPW for losses in income that is attributable to project impacts. Between 2016 and 2020, LNP registered the highest income of US\$2,574.00 in the year 2017 and the lowest was in the year 2020 when US\$685.00 was realized. The low figure in 2020 was attributed to prevalence of COVID-19.

As compensation the DNPW will receive US\$2,574.00 in annual compensation being the highest annual revenue amount realized in the previous five years.

Communication and advertisement: funds shall be provided to produce pamphlets or online advertisements prior to work and after work is over to present the work and to re-attract tourists after work (distribution of vouchers, etc.). This fund shall be around US\$70,000 and will be determined in the Resettlement Action Plan

DNPW approximate cost (\$US)	The total cost will depend on the impact on the reserve's gross revenue and on the upcoming Resettlement Action Plan for Phase II
Responsibilities	DNPW will receive the fund to carry out certain measures in order to ensure quality standards are attained.
Schedule	Prior to work
Monitoring	The Resettlement Action Plan for Phase II shall include all economic impacts at LNP (based on this compensation plan), and PMT will develop a monitoring for these impacts
Performance indicator(s)	A suggested performance indicator is the gross revenue of LNP and the Nyala Lodge concession, during and after work.
Responsibilities for monitoring	The Resettlement Action Plan for Phase II shall determine the responsibilities for monitoring
Outcome, frequency and disclosure	The Resettlement Action Plan for Phase II shall determine the outcome, frequency and disclosure. The disclosure will be conducted following the Stakeholder Engagement Plan (SEP) developed in line with ESS 10: Stakeholder Engagement and Information Disclosure

Compensation Plan for Lengwe National Park

This compensation plan concerns activities that do not relate to the construction contractor or design solutions

Compensation 2

DNPW attendance during clearance and construction works: DNPW will guide the clearance of vegetation from the alignment, identifying which trees and shrubs are to be retained where on site. They will also need to provide increased surveillance due to the presence of workers in the Park, and the potential for access for others along the alignment.

Monitoring of Wildlife: DNPW will monitor populations of wildlife present in Lengwe before, during and after construction is required to understand the use of the park by wildlife and inform the management measures to bring the Park back into condition.

Provision of native trees and shrubs for habitat restoration and replanting: As part of the restoration of affected parts of the site and as part of the habitat enhancement measures to be undertaken, native trees and shrubs of local provenance will be required. DNPW will collect seed and grow these to ensure that adequate numbers of the right species are available for the restoration planting and aftercare. The plants will be made available to the Contractor for planting.

<p>DNPW approximate cost (US\$)</p>	<p>Assuming an area of 84ha for woodland restoration and enhancement at a tree density of 1 tree per 100 M² (this equates to 144 trees per hectare), 12,009 trees must survive the restoration plan. SVTP will support restoration and enhancement of 60 ha of thickets (mainly <i>Pterocarpus antunesii</i>), at 1 shrub per 5meters (484 shrubs per ha) which totals 29,040 shrubs (square planting).</p> <p>Cost of growing trees and shrubs for restoration planting:</p> <ul style="list-style-type: none"> • Borehole for watering the nursery at US\$15,000.00 • Nursery structure and fencing at US\$3,000.00 • Tubes and seed at US\$20,000.00 • Staffing for 2 years for 2 officers at (US\$200/person/month) US\$9,600 <p>Support during clearance and cutting of wood at US\$150,000 (including DNPW transportation)</p> <p>As part of wildlife monitoring, SVTP will support DNPW to monitor the long term trends in wildlife population in the Park.</p> <ul style="list-style-type: none"> • both before, during and after the construction at US\$50,000 per aerial survey translating to US\$150,000.00 for three years of monitoring; collars costs US\$15,000; radio and radio transmitting equipment US\$30,000
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	<ul style="list-style-type: none"> A fulltime Biodiversity Expert to monitor, about US\$15,000 per year, and collars would need to be fitted at least 6 months before the start, during construction, and at least 6 months at post construction. A total of 3 years of monitoring is therefore necessary (US\$45,000 for the biologist) <p>The total is US\$438,000 (if construction is longer cost will be amended in collaboration with DNPW appropriately)</p>
Responsibilities	DNPW will receive the fund to carry out the measures in order to ensure quality standards are attained
Schedule	Before (collecting seed and growing on trees and shrubs; monitoring) during construction (clearance attendance; growing on of trees and shrubs; biodiversity monitoring; habitat enhancement works; restoration planting) and into operation (monitoring; restoration planting)
Monitoring	This ESMP and Biodiversity Management Plan shall include all economic and biodiversity impacts at LNP, and develop a monitoring plan for these impacts by DNPW and consultant
Performance indicator(s)	A suggested performance indicator is the area rehabilitated / restored and survival rate of the planted trees.
Responsibilities for monitoring	The ESMP and BMP for LNP shall determine the responsibilities for monitoring
Outcome, frequency and disclosure	The ESMP and BMP for LNP shall include all economic and biodiversity impacts at LNP, and develop a monitoring for these impacts

Compensation Plan for Lengwe National Park	
This compensation plan concerns activities that do not relate to the construction contractor or design solutions	
Compensation 3	
Strengthened security and patrols during construction:	
DNPW shall keep permanent law enforcement personnel to increase patrol and law enforcement effort during construction phase, to protect workers. DNPW shall also training session for workers (induction training) along the canal alignment that may act entry point for poachers.	
<ul style="list-style-type: none"> • Salary for 18 rangers at US\$243,000.00 • 3 patrol vehicles at US\$240,000.00 • Rangers houses at US\$1,260,000 	
Approximate cost (\$US)	Cost to increase the DNPW capacity of existing water points
Responsibilities	DNPW will receive the fund to carry out these measures to ensure quality standards are attained. The PMT will backstop the supervision of construction of the duplex structures.
Schedule	Prior to construction works commencing on the main alignment, but following the detailed design completion
Monitoring	Monitoring of activity during construction is important in order to determine and prevent adverse impacts to wildlife.

The summary of compensation is presented in the table 7.

Table 7: Summary of costs for compensation for LNP

Mitigation / Compensation	Cost for mitigation / compensation in USD	Cost for mitigation / compensation in Malawi Kwacha (1 USD = 715 Kwacha)
	<p>1,114,174.00 (best case scenario: 1 year loss of business revenue) to</p> <p>1,118,600.00 (worst case scenario: 2 year loss of business revenue)</p>	<p>911,394,332 (best case scenario: 1 year loss of business revenue) to</p> <p>915,014,800 (worst case scenario: 2 year loss of business revenue)</p>
Cost of Action Plan for health and safety (assumes 3 years of sensitization: to be increased as part of SVTP-III)	1,118,880	915,243,840
Cultural Heritage	194,050	158,732,900
Cost of Action Plan for socioeconomic impacts (including cattle bridge, footpath and vehicle bridge) and cultural heritage Plan	4,063,280	2,905,245,200
	From 6,490,384.00 to 6,494,810.00	From 5,309,394,112.00 to 5,312,754,580.00

8. OTHER MEASURES

This section details impacts that do not relate to the construction contractor or operator of the scheme. The social impacts that relate to resettlement and will be dealt with in the Resettlement Action Plan, although livelihood activities impacted by access to protected areas are addressed separately in the Project's process framework document; other social impacts are included here or in Chapter 9.

8.1 Natural Resources Management Component

A number of small-scale activities will be undertaken to deliver improvements to the natural resources in Elephant Marsh RAMSAR site, Lengwe National Park, Mwabvi Wildlife and Matandwe Forest Reserves. These activities may include improving roads for security and tourist use, providing fencing, providing habitat improvements, creating fishponds or providing fish processing machinery. These works are not expected to result in detrimental impacts to the sites that they are improving, and a screening process will be followed as described in Annex 1 using the screening form in Annex 2 prior to undertaking these works, to ensure that all environmental and social risks are identified. If necessary, as dictated by the screening form, an ESIA or an ESMP will be prepared prior to undertaking the works, to comply with Malawian legal requirements and to ensure the works can be carried out in accordance with the World Bank Requirements, and as necessary appropriate mitigation measures and controls incorporated into the construction contracts.

Waste Management Planning

Waste management: The project area has poorly developed pollution and solid waste management with unregulated waste dumping and burning, including hazardous waste disposal. Studies will be conducted to determine strategies for controlling the increased generation of waste that are expected to occur throughout the transformation of the valley.

The TORs to be developed for the Waste Planning exercise to be undertaken during the first two years of SVTP-II that will ensure that the study will lead to solutions that can be implemented in compliance with the World Bank ESF. The TORs will be prepared by the PMT for no objection of World Bank.

OHS Training

ILO reports that the sector with the greatest number of accidents (fatal and otherwise) is agriculture. The project will increase awareness and provide access to information about safe agricultural practices, for use by farmers in the Shire Valley. Similarly a program of sensitization of the community to the irrigation infrastructure with respect to health and safety will be developed and implemented during SVTP-II. The OHS training will be informed by the World Bank requirements.

Although the Project mitigation and compensation package cannot solve all health problems that exist in the study area, many of which will not worsen due to the project. In fact, many health measures require the intervention of stakeholders that are not necessarily related to the Project and would require commitments from the Government. In the framework of the Project and this ESMP, attention is paid to schistosomiasis (bilharzia) as this disease is directly related to irrigation schemes and its prevalence could increase due to the Project. Attention is also placed on the increased prevalence of pesticides and

other farm chemicals as part of the commercialization of the valley, and their use by farmers within and outside commercial operations.

Action plan for Worker and Community health and safety		
Reminder of impacts on H&S (as presented in ESIA)		Significance
Impact 1	Schistosomiasis. An increase of schistosomiasis in the command area is expected	Moderate
Impact 2	Drownings & agricultural safety. The presence of main canals may lead to drownings. Agriculture is a high risk sector for safety.	Major
Impact 3	OHS: Communities, especially children, get attracted to construction sites where exposure to accidents can occur.	
Impact 4	Sexual Exploitation Abuse and Harassment (SEAH) and Gender Based Violence (GBV): The influx of people into communities close to construction sites may give rise to SEAH as economic disparities expose vulnerable groups. GBV cases may increase owing to extra-marital affairs, drug and alcohol abuse that may arise.	
Impact 5	Communicable diseases.: Increase in number of people coming into communities in the vicinity of construction sites may lead to an increase in communicable diseases such as sexual transmitted diseases (STIs)	
Impact 6	Labour influx: Construction works offer opportunities for job seekers. The competition that arises between residents and incoming job seekers may bring animosity between the two groups. Cultural conflicts may also arise owing to coming in of people from different cultural backgrounds.	
Impact 7	COVID-19: Increasing population and arrival of people from across the country and the globe increase the risk of spreading COVID-19. This is compounded by inadequacies in the capacity of health systems to manage COVID-19	

Mitigation 1 (community health):

In order to fight schistosomiasis, several measures must be implemented at time of Project implementation:

- Sensitization and health education by the health sector shall be repeated frequently during many years to obtain the beginning of a result. Sensitization for the use of latrines for defecation or at least, defecation away from houses, paths, water pools could bring improvement.
- Treatment of patients by oral praziquantel: systematic mass treatments by praziquantel must be repeated yearly and expended to all people.
- Microscopic diagnosis to confirm the cause of the symptoms for urinal and intestinal schistosomiasis shall be strongly reinforced from current situation.
- Sensitization at school and village level (it shall focus on other topics of this Action Plan as well):
 - ✓ Health and safety regarding work and the presence of machinery
 - ✓ The use of canal (regarding schistosomiasis)
 - ✓ The risk from drowning in canal
 - ✓ Posters on these three topics shall be made and distributed to school teachers and at health clinics, radio advertisement shall be made

These measures are continuous through SVTP I and II and continue into the operational phase of the program

Approximate cost (\$US)	<p>The cost of a single 600-mg tablet is about 0.08 USD and an average treatment is estimated to be between 0.20–0.30 USD (WHO, 2016). For a projected population of 677,933 Chikwawa district for the year 2027, the total cost per year is between US\$135,587 and US\$203,380. The Government can apply to obtain free praziquantel through the WHO.</p> <p>Similarly, for a projected population of 347,403 for Nsanje district for the year 2027, an estimate of between US\$70,000.00 and US\$105,000 shall apply</p> <p>Cost of microscopes</p> <p>The cost to purchase 14 microscopes for Chikwawa district will come to : US\$7,000.00; whereas for Nsanje 7 microscopes will be required at a cost of US\$3,500.00</p> <p>Sensitization shall involve 2 local health specialists full time for 5 months per district: US\$10,000</p> <p>Capacity building for health specialists to use up to date detection method for both Bilharzias (schistosomiasis) (Ministry of Health): US\$20,000</p> <p>The cost for production and printing of posters and radio advertisement shall be around US\$10,000</p>
Responsibilities	Health specialists (Ministry of Health). This will require continuous capacity building in order to learn how to detect intestinal schistosomiasis

	<p>The Project shall request local health workers to carry out a vast sensitization program in the Phase I area on canal and associated risk from schistosomiasis</p> <p>Production and printing of posters and radio advertisement can be delegated to a local publishing company (Blantyre)</p>
Schedule	<p>Prior to construction for sensitization</p> <p>Treatment for praziquantel shall be an ongoing activity that must start during operation of the scheme</p>
Monitoring	<p>Monitoring of schistosomiasis shall focus on both urinal and intestinal schistosomiasis. Monitoring would necessitate additional microscopes. The purchase of equipment shall be done in consultation with local health clinics</p> <p>Monitoring shall be done using a constant sample of all ages in the population to compare the evolution of both infections</p>
Performance indicator(s)	<p>The evolution of number of infections is the performance indicator</p>
Responsibilities for monitoring	<p>Health specialists (Ministry of Health)</p>
Outcome, frequency and disclosure	<p>Monitoring of schistosomiasis shall be reported in a yearly report by health workers (as part of their normal work) (during scheme operation)</p>

Mitigation 2:

Community Safety & Health: Sensitization at primary schools will be carried out to inform children about the danger of canals. They will also carry out sensitization within local communities directly along the route of the main canals.

Worker Safety & Health: training and materials for farm workers on safe working practices will be prepared, and disseminate this within the community

These measures are in addition to the measures integrated into the design of the canal as part of the safe design. They are also in addition to the measures incorporated into the Construction Contract to ensure safe construction.

Approximate cost (\$US)	Cost of preparing and delivering school awareness sessions over a 5 year period at 2 sensitizations per month: USD25,000 Cost of developing materials and sensitizing local communities over a 5year period, based on 2 sensitisations per month: USD25,000 Cost of developing materials (pamphlets, posters etc), including the annual review and update of these materials, and the copying and dissemination USD100,000 Total: US\$100,000
Responsibilities	PMT will oversee the preparation of the materials and co-ordinate the program of sensitisations and information release
Schedule	The information and design of the sensitization courses shall occur prior to the completing of construction, and the first dissemination of sensitization shall commence prior to the first filling of the canal.
Monitoring	PMT will oversee the program for the delivery of the sensitisations and preparation of the materials
Performance indicator(s)	The number of people that have drowned in the canal and number of treatments for Bilharzia, and the evolution of agricultural accidents
Responsibilities for monitoring	PMT will collect data from Ministry of Health, Ministry of Labor and from the Police department, starting prior to the
Outcome, frequency and disclosure	Whenever an accident occurs, the accident report shall be disclosed to MoAIWD and other relevant institutions

Mitigation 3: Orient communities on OHS measures that reduce risks to drowning, construction and traffic accidents and risks associated with pesticides

<p>These measures are in addition to the measures integrated into the design of the canal as part of the safe design and those spelt out in the ESCP. They are also in addition to the measures incorporated into the Construction Contract to ensure safe construction.</p> <p>The measures are meant to minimise risks of pesticide exposure and exposure of communities to construction sites, proximity to construction materials, and risks of water in the canal when the SVTP becomes operational.</p>	
Approximate cost (\$US)	<p>Cost of preparing and delivering community awareness sessions over a 5 year period or 2 sensitizations per year at \$25,000 per year: USD125,000</p> <p>Cost of developing materials and sensitizing local communities over a 5 year period, based on 2 sensitizations per year at US\$25000 per year: USD125,000</p> <p>Total: US\$250,000.00</p>
Responsibilities	PMT and the Directorate of OHS in the Ministry of Labour conduct of community awareness, preparation of the materials and co-ordinate the program of sensitizations and information release
Schedule	The information and design of the sensitization activities shall occur prior to the commencement of and during construction, and the first dissemination of sensitization shall commence prior to the first filling of the canal.
Monitoring	PMT will oversee the program for the delivery of the sensitizations and preparation of the materials
Performance indicator(s)	The number of people that have been oriented to OHS; Number of OHS cases reported and how they have been resolved.
Responsibilities for monitoring	PMT will collect data from the Supervising Engineer, Ministry of Labor and the Police department, starting prior to the construction phase
Outcome, frequency and disclosure	Whenever an accident occurs, the accident report shall be disclosed to MoAIWD and other relevant institutions through the SE in monthly reports from the SE and quarterly reports produced by the PMT for MoAIWD and bi-annual reports produced by the PMT to the World Bank.

<p>Mitigation 4: Community Safety & Health</p> <p>Cases of SEAH and GBV will be reported to the GBV champions in the communities. The cases will be reported to the nearest police or at the one-stop centre at the district hospital for redress. Sensitization at community forum, primary schools and district consultative meetings will be carried out to inform parents, and children about the potential of occurrence of SEAH and GBV cases, prevention, reporting and management.</p>	
<p>These measures are in addition to the measures integrated into the design of the canal as part of the safe design. They are also in addition to the measures incorporated into the Construction Contract to ensure safe construction.</p>	
Approximate cost (\$US)	<p>Cost of preparing and delivering community, district and school awareness sessions over a 5 year period at US\$7500 / year for 2 sensitizations per year: USD75,000</p>

	Support to GBV champions for 5 years at US\$7500 / year for 2 sensitizations per year: USD75,000 Total : US\$150,000.00
Responsibilities	PMT will oversee the preparation of the materials and co-ordinate the program of sensitizations and information release
Schedule	The information and design of the sensitization courses shall occur prior to the completing of construction, and the first dissemination of sensitization shall commence prior to the first filling of the canal.
Monitoring	PMT will oversee the program for the delivery of the sensitizations and preparation of the materials
Performance indicator(s)	The number of people that have drowned in the canal and number of treatments for Bilharzia, and the evolution of agricultural accidents
Responsibilities for monitoring	PMT will collect data from Ministry of Health, Ministry of Labor and from the Police department, starting prior to the
Outcome, frequency and disclosure	Whenever an accident occurs, the accident report shall be disclosed to MoAIWD and other relevant institutions

Mitigation 5: Communicable diseases	
Community Safety & Health: Sensitization community fora on the risk of contracting communicable diseases such as STIs.	
Worker Safety & Health: SVTP will orient workers on risks of communicable diseases and safe sex. Promotion on use of abstinence, need to report to health centres, and use of condoms will be carried out as part of the orientation.	
These measures are in addition to the measures integrated into the design of the canal as part of the safe design. They are also in addition to the measures incorporated into the Construction Contract to ensure safe construction.	
Approximate cost (\$US)	Cost of sensitising communities over a 5 year period at US\$5000 per activity for 2 sensitizations per year: USD50,000 Cost of orienting construction workers on communicable diseases over a 5 year period, based on US\$5000 per activity for 2 sensitizations per year: USD50,000 Total: US\$100,000.00
Responsibilities	PMT will oversee the preparation of the materials and co-ordinate the program of sensitizations and information release
Schedule	The information and design of the sensitization and orientation of communities and construction workers on communicable diseases will commence prior to construction works and during disclosure sessions.

Monitoring	PMT will oversee the program for the delivery of the sensitisations and preparation of the materials
Performance indicator(s)	The number of reported cases of communicable diseases and number of people that complete treatment for communicable diseases .
Responsibilities for monitoring	PMT will collect data from Ministry of Health (health centres), and contractor on reported acses of communicable diseases and number of completed treatment cases.
Outcome, frequency and disclosure	Reports on infection rate of communicable diseases and treatment shall be disclosed to MoAIWD and other relevant institutions

Mitigation 6: SEAH / COVID-19	
Community Safety & Health: Sensitization at community fora and district level will be conducted on the need to mainstream COVID-19 prevention measures at community level including those that secure work with the contractor.	
Worker Safety & Health: Workers will, apart from making an undertaking in the Code of conduct, be required to comply with COVID-19 prevention measures. These will include respect for social distance, wearing of face masks and encouragement to accept vaccines.	
These measures are in addition to the measures incorporated into the Construction Contract to ensure safe construction including contractor’s Code of Conduct and advice of the Ministry of Health.	
Approximate cost (\$US)	Cost of preparing and delivering community awareness sessions over a 5 year period at US\$5000/activity for 2 sensitizations per year: USD50,000 Cost of delivering awareness including prevtion materials over a 5 year period, based on 2 sensitisations per year at US\$5000 / activity: USD50,000 Total : USD100,000
Responsibilities	PMT will oversee the preparation of the materials and co-ordinate the program of sensitisations and information release
Schedule	The information and design of the sensitization sessions shall occur prior to the completing of construction, and the first dissemination of sensitization shall commence prior to thecontractor mobilisation.
Monitoring	PMT will oversee the program for the delivery of the sensitisations
Performance indicator(s)	The number of people that have sensititised segregated by gender at community and contractor levels.
Responsibilities for monitoring	PMT will collect data from Ministry of Health

Outcome, frequency and disclosure	A report shall be produced twice a year and be submitted to MOAIWD
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Table 8: Summary of costs for Health and Safety Actions

SUMMARY OF MITIGATION ACTIONS FOR HEALTH AND SAFETY					
No	Description	Unit	Unit Cost	Quantity	Cost
1	Schistosomiasis				
	Treatment costs in Chikwawa	US\$ / Year	203,380.00	1	203,380.00
	Treatment costs in Nsanje	US\$ /microscope	105,000.00	1	105,000.00
2	Provision of microscopes				
	Chikwawa	US\$ /microscope	500.00	14	7,000.00
	Nsanje	US\$ /microscope	500.00	7	3,500.00
3	Community Sensitisation	US\$ per manmonth	5,000.00	10	50,000.00
4	Capacity building of health specialists	lump	20,000.00	1	20,000.00
	Cost of preparing and delivering school awareness sessions	US\$ / session	2,500.00	6	15,000.00
	Cost of developing materials and	US\$ / session	2,500.00	6	15,000.00

	sensitizing local communities				
	Cost of developing materials (pamphlets, posters etc)	lump	100,000.00	1	100,000.00
	OHS Training	US\$ / year	50,000.00	5	250,000.00
	GBV Interventions	US\$ / year	30,000.00	5	150,000.00
	Communicable diseases	US\$ / year	20,000.00	5	100,000.00
	COVID Interventions	US\$ / year	20,000.00	5	100,000.00
	Total Health and Safety				1,118,880.00

8.2 Engaging with Law Enforcement

To minimize the risk of sexual harassment and gender based violence due to the influx of male workers in the Project area, PMT will request the regular presence of the local law enforcement in the vicinity of construction works. The local law enforcement’s presence shall send a strong message to workers, for example who will engage in sexual harassment and poaching.

The presence of local law enforcement will also help avoid the creation of shantytowns from people attracted to the site to find work. Local law enforcement will be made aware of the risk and shall be requested to answer any complaints about illegal settlement and collaborate with traditional authorities on a regular basis to rapidly take action.

8.3 Managing a period of Rapid Social Change

There is a risk that people do not change their lifestyle and develop skills rapidly enough to adapt to the new irrigated environment. The current CCPLTRPF assignment aims at collecting people’s grievances and communicating about the Project. The Social Engagement Plan provides a tool to ensure social acceptability of the Project and compliance to ESS 10: Stakeholder Engagement and Information Disclosure.

8.4 Fish Ponds and alternative income

Declines in fisheries (whether attributable to SVTP or simply to overfishing) could be compensated by creating fish farms using native species. Factors to consider for fish farming are presented in the “Agricultural Development Planning Strategy” study (PWC, 2016).

In particular, the initiatives that commenced under Phase 1 with respect to improving the sustainability of fisheries within Elephant Marsh shall be continued in Phase 2, and potentially scaled up as new communities form Community Conservation Areas. These initiatives will consider how to reduce human-wildlife conflict in and around Elephant Marsh.

8.5 Archaeology and Cultural Heritage

Detailed work was undertaken during the preparation of the ESIA to identify locations of cultural heritage importance and are areas of potential buried archaeology. Surveys of the areas to be affected either by canal infrastructure or the creation of the command areas were undertaken (as described in the ESIA) following which salvage archaeology was undertaken within Phase 1 area to rescue and safeguard high priority artifacts prior to the start of construction. The reason for that is that Malawi’s national heritage legislation requires rescue excavations of sites at risk of destruction from development.

In addition, a chance finds procedure was implemented during the construction works in Phase 1. This approach will be continued for Phase 2, under the same management arrangements and using the same providers for the Archaeological rescue works

8.5.1 Rescue Archaeological Investigations in Phase 2

Archaeological sites that will be impacted negatively by the Project’s activities in Phase 2 and that indicate high scientific value for study and analysis will also undergo excavations before any land transformation activities commence. This program will be facilitated by PMT, who will engage the Department of Antiquities to undertake the works. The MDoA under the auspices of the Ministry of Culture is responsible for issuing of permits to conduct archaeological excavations in Malawi, and PMT will liaise with MDoA to obtain the necessary permit prior to commencement of the rescue.

Locations for Archaeological Rescue Excavations

The presumption is to preserve known areas of interest insitu, without disturbing them. However, sites that are categorized in the ESIA as being of high priority will undergo controlled archaeological rescue excavations, where they occur in areas that will be affected by construction activity. Based on the FS canal alignment and command areas, and the site prioritization classification described in the ESIA, the sites listed in Table 6 would be expected to undergo rescue excavations before Project launch. However, only once the detailed design is complete will the investigations be undertaken, to ensure that only those features on the actual Canal alignment routes and affected by the actual localization of command areas will be rescued.

Table 9: High Priority sites that may be affected in Phase 2

High Priority Sites	Data	Coordinates & location	Impacted by the Project
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CK46	Decorated pottery. Elevated open air site behind PAPA James' concession; dense surface scatters of archaeological material	698155 E 8212354 N Zone I 1, Mwanza River	Yes (Situating in irrigation zone)
CK55	Decorated pottery, stone artefacts, daga remains (house remains). Flat open air site in cultivated field with dense surface scatters of archaeological material	687513 E 8222782 N Zone I 1 Nthumba River	Yes (45 m west of current Canal RoW)
CK62	Decorated pottery, daga remains (house remains). Elevated open air site with dense surface scatters of archaeological material	688002 E 8214624 N Zone A Mologeni Village	Yes (55 m east of current Canal RoW)
CK64	Decorated pottery, daga remains (house remains). Elevated open air site with associated termite mound; dense surface scatters of archaeological material	688010 E 8214841 N Zone A Mologeni Village	Unclear (ca. 125 m west of current Canal RoW)
CK76	Pottery well embedded in the soil (primary context). Flat open air site behind modern household; dense scatters of archaeological material	680679 E 8205290 N Zone A Ndakwera Village	Unclear (at the edge of irrigation area)
CK77	Pottery well embedded in the soil (primary context). Flat open air site in between modern households; dense scatters of archaeological material	680669 E 8205162 N Zone A Ndakwera Village	Unclear (25 m west of irrigation area)

The archaeological sites listed in Table 6 are considered as high priority for controlled archaeological excavations as they exhibit dense scatters of surface material as well as decorated pottery that is well embedded in the soil. Investigating these sites will hopefully yield an undisturbed stratigraphic sequence for purposes of site reconstruction and dating.

Excavating High Priority Sites

High priority sites will be excavated by hand, using trowels, hand mattocks, shovels, etc. by natural and/or arbitrary levels. All soil will be screened with sieves. During the course of the excavations, artifacts such as pottery, chipped stone, and slag will be collected for processing. If present, bone, shell, charcoal (for radiocarbon dating), and other organic materials will also be collected. Soil samples may be collected for later processing for extraction of datable carbon or to assist in the identification of various stratigraphic levels. Complete and accurate notes of field procedures and results will be maintained and excavations documented with photographic maps, profiles, and plan drawings.

Laboratory Processing and Curation

Laboratory analysis is an interpretive step in an archaeological investigation. While on-site evaluation collects data, laboratory processing and analysis summarizes these data and allows meaningful statements regarding the site. Laboratory processing will include washing, sorting, cataloging, and tabulation of collected materials. These may be considered preliminary steps to analysis.

All artifacts and copies of all site forms, notes, reports, photographs, and maps generated from the identification, management, and analysis of cultural properties will remain the property of Malawi and will be deposited at MDoA. Some artifacts could also be displayed at the Tisunge! Lower Shire Heritage Centre at the entrance of LNP.

Specialized Analysis of Collected Artifacts

If feasible in Malawi, collected artifacts could be further analysed using various techniques ranging from visual analysis by specialists to specialized dating techniques (*e.g.*, C-14 analysis) (at specialized facilities). A major emphasis of analysis is the dating of sites. Dating techniques may include:

- Analysis of diagnostic artifacts, such as ceramics, and chipped and ground tools
- Radiocarbon dating, and
- Analysis of geological strata.
- Another emphasis would be the faunal analysis of bone material, pollen and/or soil analysis

Rescue Archaeology Report Preparation

Report preparation and scientific analyses will conform to current internationally accepted practices. Publications in peer-reviewed journals and conference papers on the results of the studies are a positive way in which the Project can meet its obligations regarding transmitting heritage information to the wider public.

8.5.2 Archaeological Monitoring, Contractor Awareness Training and Chance Finds Procedure

In areas affected by works in Phase 2, the initial clearance and top-soil strip shall be supervised, and a Chance Finds Procedure shall be required. To ensure this is effective, the Contractor's workers will be trained to know what to look for.

Archaeological Monitoring of Land Transformation Activities

Recognizing archaeological features poses a great challenge to the untrained eye, a professional team from MDoA will be engaged to carry out an initial one to two months period of archaeological supervision and monitoring when works start at Phase 2. This team will also provide training and awareness to Contractor personnel, and particularly the Contractor's Environment Specialist who will be responsible for ensuring all relevant workers are briefed.

The types of remains that might be uncovered during land-transformation activities include:

- Unknown burial places: They often have negligible surface visibility and can be encountered in many locations. Human bones, in an archaeological context, are normally light brown to dark brown, and are often easily distinguishable from surrounding sediments. In contrast to most of the animal bones that would be present in a midden deposit, human bones are usually intact. However, many human burials can be incomplete or contain scattered, partially decayed bones that fragment easily. Also present may be funerary objects associated with the burial. All burial sites must be reported immediately.
- Archaeological deposits: archaeological deposits can be darker than surrounding sediments and can be distinguished from natural soils by the following attributes, individually or in combination: black soil, patches of reddish brown or yellow-brown fire-stained (oxidized) sediments, scatters or concentrations of archaeological material such as pottery, stone tools, metal implements and slag.

Monitoring land-clearing activities will assist in determining if deeply buried subsurface deposits are present within the Project area. Monitoring is defined as active observation of earth-moving or other work that could adversely affect cultural resources within the Project Area and includes, as warranted by circumstances: observation, data recording, data recovery, archaeological excavation, photography,

laboratory analysis and cataloguing, ancillary special studies, and production of a written report that meets current professional archaeological standards. Such monitoring activities are conducted by qualified archaeologists from MDoA.

Monitoring, will achieve several objectives:

- To ensure that a site is avoided (including checking to ensure the boundaries of a site are properly fenced, or marked) and/or not inadvertently damaged if it is buried;
- During and just after surface clearing activities, to collect surface artifacts and record features uncovered during clearing, and
- During earth moving activities (grading, trenching) to assess if buried sites are present.

To facilitate this, archaeological monitoring will occur during the clearance of vegetation and topsoil strip of the canal infrastructure works, as specified by the archaeological specialists.

If potentially important cultural materials are encountered during construction, work will halt, and the immediate area protected until the archaeological monitoring team evaluates the find. If the Project archaeologist determines that the discovery is important, appropriate salvage excavations will be formulated and implemented (see below “Salvage Excavations”).

Report Preparation

The archaeological specialists will be required to prepare a report detailing the works and scientific analyses performed. The report will conform to current internationally accepted practices. Publications in peer-reviewed journals and conference papers on the results of the studies are a positive way in which the Project can meet its obligations regarding transmitting heritage information to the wider public.

Contractor Training and Awareness Program

The archaeological specialists will train the Contractors’ personnel involved in site clearance and soil strip, and the Contractor’s Environment Specialist, on the works that they are doing, the arrangements that they have for the works and on the identification of artifactual materials and bones, which might be found in the Project area. They will also train the Contractor’s personnel on the Chance Finds Procedure for reporting the discovery to supervisory personnel. The training will make it clear that any artifacts discovered are the property of Malawi, and after recording, analysis, and cataloguing that they will be prepared for curation at a national institution.

Chance Finds Procedure and Salvage Excavation

Considering the considerable volume of soil that will be excavated, the Project will apply a chance finds procedure, to set out what is to be done when cultural heritage objects are unexpectedly uncovered during works, especially during the absence of an archaeological monitoring team. The following procedures will need to be followed:

- Work should be stopped in the vicinity of the finding (very often work can be continued at another part of the project to avoid costly delays)
- Notify the Supervising Engineer or his/her designee. The finding should be treated as a cultural heritage incident and reported.
- Notify the Malawi Department of Antiquities in the case of any archaeological or palaeontological finds.

- Use heritage experts and relevant community members to assess the significance of the discovery, and report it as required by law.
- Seek advice from the Supervising Engineer on the right way to manage the discovery. The Supervising Engineer, will provide the advice following consultation with the relevant community groups and/or relevant archaeologists.
- Resume work if permitted and agreed by the Supervising Engineer, following clearance of the Department of Antiquities.

Salvage Excavation

Data collection during excavation can provide important information concerning a site. Examination of the pit excavation profile often reveals a range of features, which may not be obvious in smaller excavation units. Cleaning and examination of the excavation profile can reveal buried sites, features (e.g., hearths, pits), and concentrations of artifacts. Based on the type of artifacts and features found, samples of artifacts, and soils may be removed for further analysis and processing; detailed photographs should be made, and profile drawings completed.

Sites deemed as of high priority for salvage excavation, will be tagged and potentially damaging activities in the vicinity will be halted to allow the monitoring team enough time to salvage-excavate the discovered features. Sites that are problematic to classify may undergo shovel test pits. Shovel test pits or augers may be used to excavate small holes to a depth of approximately one meter below surface during surface survey activities. The purpose of these excavations will be to rapidly verify the horizontal and vertical extent of a site's cultural properties and its scientific importance.

The main purposes of archaeological rescue excavations are to:

- Determine depth of cultural deposits;
- Determine presence/absence of various kinds of artifacts, charcoal, structural remains, and human remains;
- Delineate further site boundaries;
- Delineate further site age;
- Collect special samples (radiocarbon, slag, pollen, etc.).

Approximate cost (\$US)	<p>2 Months of preconstruction archaeological rescue excavations: 4 experts per month (2 archeologists from the MDoA)</p> <p>1 month to prepare and deliver regular contractor training and awareness spread across the first eight months of clearance and topsoil strip: 1 expert per month</p> <p>Eight months archaeological monitoring of land transformation activities during construction: 6 experts per month (2 archeologists from the MDoA)</p> <p>= 57 expert/months = US\$94,050</p> <p>For any chance finds, an allowance for the cost for salvage excavation has been included in project costs of US\$100,000</p>
Responsibilities	<p>Archaeological teams undertaking investigations will include at least 2 archeologists from the MDoA. These specialists will undertake and oversee:</p> <ul style="list-style-type: none"> • Archaeological rescue excavations • Contractor training and awareness program • Initial one to two months archaeological monitoring of land transformation activities during construction • Salvage excavations in case of discoveries <p>Construction contractor will work with the archaeological teams during the clearance and topsoil strip, and will implement the chance find procedure</p>
Schedule	<p>Initial archaeology rescues will be undertaken prior to start of construction works.</p> <p>Supervision by the archaeology team will be provided during the land clearance and topsoil strip.</p> <p>Chance Finds Procedure will be implemented during the works.</p>
Monitoring	<p>PMT will oversee the works in advance of construction.</p> <p>The Supervising Engineer shall supervise compliance with contractual requirements.</p>
Performance indicator(s)	<p>Completion of the advanced rescue at a minimum of 3 sites and maximum of 6 sites prior to construction works.</p> <p>Successful implication of Chance Finds Procedure</p>
Responsibilities for monitoring	<p>Archaeological monitoring team (MDoA)</p> <p>Supervising Engineer (Environmental specialist)</p> <p>Construction Contractor (Environmental specialist)</p>
Outcome, frequency and disclosure	<p>Artifact collected during archaeological rescue excavations shall be published in peer-reviewed journals and conference papers</p> <p>Monthly compliance reports (by the Supervising engineering firm)</p>

Table 10: Summary of costs for Archaeology and Cultural Heritage

SUMMARY OF MITIGATION ACTIONS FOR CULTURAL HERITAGE

Description	Unit	Unit Cost	Quantity	Cost
Salvage Excavation	lump	100,000.00	1	100,000.00
Preconstruction archaeological rescue excavations	US\$ / expert month	1,650.00	8	13,200.00
Prepare and deliver regular contractor training and awareness	US\$ / expert month	1,650.00	1	1,650.00
Archaeological monitoring of land transformation activities during construction	US\$ / expert month	1,650.00	48	79,200.00
Grand Total for Cultural Heritage				194,050.00

8.6 Action Plan for gender and youth

The tables that follow set out the actions to be undertaken to implement the Gender and Youth Strategy (see CCPLTRPF for details and Cowi 2016) and the institutions that are responsible for undertaking the actions.

PREPARATORY PHASE (SOME OF THE MEASURES WERE CARRIED OUT BY THE CCPLTRPFCONSULTING TEAM).

Main issues	Mitigation measures to be implemented	Responsible Institution
Recruitment and capacity of consulting / project teams/ missions	Ensure that all terms of reference for consultants and staff have a gender aspect/expert in them	SVTP Management
	Train/orient all project staff and consultants on gender and youth issues, including orienting them on SVTP	SVTP Management and Consulting companies
	Where possible, ensure that the composition of staff at all levels is at least 50% women, to be in line with the 50:50 policies	Consulting companies Project Team
Implementation of stakeholder consultation process, community	Implement communication activities at all levels in the project area (ADC and VDC levels)	CCPLTRPF Consulting Team
	Develop community mobilisation guidelines that incorporate gender issues.	Consultants and District Council
Mobilisation and engagement for the SVTP	Ensure information education and communication materials are accessible to the illiterate, especially women.	Consulting companies Project Team
	Ensure women, youth and the poor are included in all field level activities, meetings and capacity building processes.	Consultants and District Council

Main issues	Mitigation measures to be implemented	Responsible Institution
Preparatory studies, baselines data collection, analysis and reporting	Orient all enumerators on gender and youth issues related to Chikwawa and Nsanje	Consultants
	Ensure that all data collection instruments are able to collect gender and youth disaggregated data.	Consultants
	Ensure that all data collection tools are gender/youth audited by the CCPLTRPF Gender and Youth Expert	Consultants
	Ensure that data is analysed and disaggregated by sex and age to capture gender and youth issues.	Consultants
Preparatory studies, baselines data collection, analysis and reporting	Orient all enumerators on gender and youth issues related to Chikwawa and Nsanje	Consultants
	Ensure that all data collection instruments are able to collect gender and youth disaggregated data.	Consultants
	Ensure that all data collection tools are gender/youth audited by the CCPLTRPF Gender and Youth Expert	Consultants
	Ensure that data is analysed and disaggregated by sex and age to capture gender and youth issues.	Consultants
Institutional development and formation of irrigation options, farmer management entities, SVTP governance and management committees	Ensure that gender and youth issues are used as criteria for choosing the SVTP irrigation institutional model.	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that women, youth and poor people are represented and actively participate in irrigation management entities	MoAIWD, National Youth Council, District Council and Technical Teams
	Train all irrigation management entities on gender and youth issues	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure women, youths and poor are included in the management, governance, implementation and technical teams of SVTP	MoAIWD, National Youth Council, District Council and Technical Teams
	Build capacity of individual farmers on gender and youth issues, including decision making at household level	MoAIWD, District Council, Technical Teams, National Youth Council and Farmer Organisations

Main issues	Mitigation measures to be implemented	Responsible Institution
	Ensure no discriminatory practices are being used to limit participation of women and youth.	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that voices of women, youths and poor are heard by management of the water management entity	MoAIWD, National Youth Council, District Council and Technical Teams
	Implement positive discrimination, if the irrigation or farmer management entities do not have representation from women, youths and the poor	MoAIWD, National Youth Council, District Council and Technical Teams
Land redistribution, resettlement policy framework and grievance mechanism	Ensure that PAPs are gender, age and poverty defined, so that it is known who is most affected by resettlement	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that women, youths and poor are also provided with land in the schemes. Government can lease off land and reallocate equitably amongst beneficiaries.	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that women and youths and poor who lose land are appropriately compensated. During compensation, ensure that all household members have access and control of the compensation by adopting a household livelihood and planning DNPWproach.	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that District Council teams, Committees and experts that value lost assets during compensation, value land as well, not just structures on it.	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that District Council teams, Committees and experts that value lost assets during resettlement planning do not sexually abuse women or girls (or any form of gender based violence)	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that land assessment teams include women and youths and ensure that land losses of female headed households are assessed by female officials/experts.	MoAIWD, National

Main issues	Mitigation measures to be implemented	Responsible Institution
	Whoever does the valuation should be gender trained.	Youth Council, District Council and Technical Teams
	Ensure that gender and youths sensitive spaces are created for women to lodge their grievances on unfair practices.	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that grievances by women are handled by women. Traditional leaders should ensure that women are included in any primary justice structures that they have in place or are to be created.	MoAIWD, National Youth Council, District Council and Technical Teams
	Encourage land being registered jointly in the name of the woman and the man.	MoAIWD, National Youth Council, District Council and Technical Teams
Monitoring and evaluation of gender and youth activities.	Ensure that the intervention logic of any project being designed has SMART and gender and youth sensitive indicators and take into account poverty	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that monitoring the progress made in applying gender and youth approaches in irrigation projects is regularly undertaken.	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that all indicators at input, output, outcome and impact level are disaggregated by gender, age, household headship, location and marital status, where necessary. Indicators that can be used are included in the annexes.	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that programme targets are gender and youth disaggregated	MoAIWD, National Youth Council, District Council and Technical Teams
	Ensure that monitoring and evaluation terms of reference and teams have gender and youth expertise.	MoAIWD, National Youth Council, District Council and Technical

Main issues	Mitigation measures to be implemented	Responsible Institution
		Teams

PROJECT CONSULTATION AND OPERATION PHASE

Main issues	Mitigation measures to be implemented	Responsible Institution
Policy level commitment to mainstream gender and youth issues in the SVTP	Promote SVTP as multiple-use (irrigation, domestic and livestock uses) irrigation and water programme.	MoAIWD in collaboration with other line ministries and government departments
	Ensure that women enjoy de jure and de facto equality in access to land and other property, including inheritance and purchase.	MoAIWD in collaboration with other line ministries and government departments
	When water management institutions do not have any or few women and youth, introduce appropriate institutional measures, such as minimum quotas for women and youth to increase participation of women and youths	MoAIWD, National Youth Council, District Council and Technical Teams, Water management Institutions
	Provide improved coordination among concerned water management institution to facilitate the implementation of multiple-use water projects.	MoAIWD, National Youth Council, District Council and Technical Teams, Water management Institutions
	Support equal employment opportunities in water management institution for both genders and for youth and older people.	MoAIWD, National Youth Council, District Council and Technical Teams, Water management Institutions
	Provide and support capacity building around gender and youth issues in water management entities with particular attention to extension staff.	MoAIWD, National Youth Council, District Council and Technical Teams, Water management Institutions

Main issues	Mitigation measures to be implemented	Responsible Institution
	Ensure effective linkages with gender and youth ministries and CSOs	MoAIWD, National Youth Council, District Council and Technical Teams, Water management Institutions
Land administration, allocation and tenure arrangements for women, youth and poor people	Conduct participatory assessments to understand the social organization of agricultural production and the specific gender and youth division of labour in the project area.	Consultants
	Implement mechanisms to ensure that the landless are also provided land and participate in irrigation activities	MoAIWD, National Youth Council, District Council and Technical Teams, Water management Institutions
	If irrigation schemes involve land titling or retitling, new land titles should be granted to women or to husbands and wives jointly. Youths should also be included.	MoAIWD, National Youth Council, District Council and Technical Teams, Water management Institutions
	Disaggregate land ownership data by gender and age to understand land ownership issues amongst women and youth.	Consultants
	Conduct local/grassroots advocacy work with traditional leaders to improve land ownership by women and jointly by woman and man	NGOs, MoAIWD, National Youth Council, District Council and Technical Teams, Water management Institutions
	Ensure that irrigation schemes have both commercial as well food security objectives by adopting integrated farming systems, not just commercial mono-cropping	Scheme management
Construction of various irrigation infrastructure and installation of equipment	Ensure that women and youth are involved so that they also benefit from the employment created, where feasible.	Contractors
	Ensure gender sensitive resettlement in terms of targeting, compensation and provision of services to new locations.	MoAIWD, National Youth Council, District Council and

Main issues	Mitigation measures to be implemented	Responsible Institution
		Technical Teams, Water Management Institutions
	Provide social safeguards to protect women and girls from being sexually abused	MoAIWD, National Youth Council, District Council and Technical Teams, Water Management Institutions
Gender and youth division of labour	The irrigation scheme should provide labour for irrigation activities in the farm. The irrigation model should not allow farmers to work using their own labour in the blocks.	MoAIWD, National Youth Council, District Council and Technical Teams, Water Management Institutions
	Ensure that planners involved in the projects are aware of women's and youth contributions to farm and household production to enable them design plans that are appropriate for women.	Planners, DEC members, irrigation officials
	Irrigation designs should carefully evaluate the availability of women's and men's work in the family and expected impacts of intervention on women's and men's income, time use, and social power.	Water Management Institutions, DEC members, community
	Community labour contribution to irrigation projects should take into consideration the contribution of women and men at household level. Where possible, this labour should be for to compensate for time lost.	Water Management Institutions, DEC members, community
	Provide appropriate labour and time saving technologies to those beneficiaries, especially those who are already overburdened with labour at household level.	Water Management Institutions, DEC members, community
	Income from irrigation at household level should be transparently used by adopting a participatory expenditure management at household level	Irrigation Scheme Management
Access and control over economic and social benefits from participation irrigation services	Provide equal access to training, finance/credit and related irrigations services for men, women and youths.	Water Management Institutions, DEC members, community leaders
	Provide training opportunities for the youth and women in advocacy and engagement and inclusion	Water Management Institutions, DEC members, community leaders

Main issues	Mitigation measures to be implemented	Responsible Institution
	Provision and promotion of (agriculture-related) vocational skills for youths which will enhance the growth of the sector	Water Management Institutions, DEC members, community leaders
	Monitor use of irrigation income/earnings at household level	Water Management Institutions, DEC members, community leaders
Farmer management entities and other institutional arrangements.	Ensure that by-laws of irrigation schemes/WUAs or its constitution provide equal opportunities for all members. Ensure that it has some affirmative actions that favour the disadvantaged groups.	Water Management Institutions, DEC members, community leaders
	Ensure that there are no discriminatory practices that are being used to limit participation of women and youth, even when bylaws provide for equal opportunity. These may include high membership fees, landlessness, access to water etc.	Water Management Institutions, DEC members, community leaders
	Implement positive discrimination, if the criteria for irrigation scheme or WUA membership is discriminatory	Water Management Institutions, DEC members, community leaders
Socio-economic empowerment of women and youths in and around irrigation schemes	Improving access to finance to enable women and youths participate in irrigation technology and value addition	Water Management Institutions s, DEC members, community leaders
	Integrate/promote village loans and savings and income generating activities in irrigation schemes	Water Management Institutions s, DEC members, community leaders
	Training women and men on human rights and the importance of women's participation in decision making at all level	Water Management Institutions s, DEC members, community leaders
	Introducing functional literacy classes in water management institutions to improve women's and illiterate men's ability to read and write so that they can effectively participate in agricultural decision making processes	Water Management Institutions s, DEC members, community leaders

Main issues	Mitigation measures to be implemented	Responsible Institution
Designing and implementing multiple use irrigation services.	Implement a strong consultation process during the planning and implementation stages to understand gender dynamics	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	During implementation, conduct training programs addressed to women to help them manage and maintain the points of supply will also be necessary. Ensure that planners understand women's and girls' water needs as women and girls will be the main users of those watering points	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	Translate multiple water needs into affordable small- and medium-scale technical irrigation designs	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	Ensure that water points are created for domestic and other social uses, especially livestock.	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	Introduce community water points because tap water may not be feasible as houses are not mostly permanent.	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
Irrigation scheme management and farmer management	Ensure that all farmers aggregate their land so that no single farmers are identified by or works on their own land.	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	When forming groups, ensure that membership fees are affordable and those that cannot afford are supported with cash transfers to be able to pay	Consultants and District Council

Main issues	Mitigation measures to be implemented	Responsible Institution
	Adopt management arrangements that have been used for the Phata Irrigation Schemes where possible	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	Ensure that farmers are organised in a way that ensure women and youth participate in the activities of the scheme and benefit from it	Irrigation Scheme Management
	Implement gender training programmes for staff and communities around the schemes	Irrigation Scheme Management
	Implement gender sensitive transparent and accountable irrigation revenue management	Irrigation Scheme Management
	Adopt agronomic principles that use technology other manual labour and ensure that farmers are paid when they provide labour.	Irrigation Scheme Management
Reaching the poorest and most vulnerable groups.	Ensure that the vulnerable and often-overlooked groups such as women, youths, PLHIV, elderly, landless workers and poor women farmers are included in all stages, including during consultation, resettlement and land reallocation, during implementation and monitoring and evaluation.	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	In order to know who vulnerable rapid vulnerability assessments should be included in the consultation processes.	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
Monitoring and evaluation of gender and youth activities Gender and youth capacity at various level	Ensure that the intervention logic of any project being designed has SMART and gender and youth sensitive indicators	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	Ensure that monitoring the progress made in applying gender and youth approaches in irrigation projects is regularly undertaken.	Consultants and DEC members, Water management institutions, local leaders and gender CSOs

Main issues	Mitigation measures to be implemented	Responsible Institution
	Ensure that all indicators at input, output, outcome and impact level are disaggregated by gender, age, household headship, location and marital status, where necessary. Indicators that can be used are included in the annexes.	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	Ensure that programme targets are gender and youth disaggregated	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	Ensure that monitoring and evaluation terms of reference and teams have gender expertise.	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	<u>Cabinet level:</u> <ul style="list-style-type: none"> • Presidential directives • Gender and youth briefings and awareness sessions • Policy briefs on gender and youth 	MoAIWD
	<u>Ministries and departments</u> <ul style="list-style-type: none"> • Establish focal points in ministries • Train planning and monitoring and evaluation officers on gender and youth • Joint planning and monitoring teams • Technical support on gender and youth 	MoAIWD
	<u>District Executive Committees Members</u> <ul style="list-style-type: none"> • Allocate resources for gender and youth analysis, gender and youth training and mainstreaming • Train of the District Executive Committee on gender and youth • Establish focal points in sectors • Joint planning and monitoring teams • Technical support on gender and youth 	MoAIWD

Main issues	Mitigation measures to be implemented	Responsible Institution
	<u>Community structures</u> <ul style="list-style-type: none"> • Orient local leaders (such as Councillors, Traditional Leaders, Religious Leaders on gender and youth issues and women’s and youth’ rights • Train of the ADCs, VDC and AECs on gender and youth • Conduct gender and youth analysis together with District and Community Teams • Train community-based volunteers in gender and youth issues such as gender and youth participation in decision making 	Consultants and DEC members, Water management institutions, local leaders and gender CSOs
	<ul style="list-style-type: none"> • Conduct participatory gender and youth analysis, planning and monitoring at community level • Establish local gender and youth forums or advocacy groups 	
	<u>Household level</u> <ul style="list-style-type: none"> • Sensitization of men, women and youth on the roles and importance of women and youth and women’s and youth’ rights 	Consultants and DEC members, Water management institutions, local leaders and gender CSOs

STAKEHOLDER ROLES

National level

At the national level, the Ministry of Agriculture, Water and Irrigation Development and Irrigation (MoAIWD), will ensure that guidance incorporates gender issues that have been identified and included in the Gender and Youth strategy. The Ministry will ensure that planners involved in the project have requisite gender analysis skills and utilise gender lens in designing the scheme. The Ministry will work closely with the Ministry of Gender, Community Development and Children Affairs and the National Youth Council to ensure that gender issues are implemented and reported in a coordinated way.

District level

At district level, the District Executive Committee will appoint a SVTP committee which will oversee implementation of the gender and youth interventions as prioritised in the Gender and Youth strategy. The DEC will monitor gender mainstreaming and affirmative actions at implementation level. It will ensure that the programme is implemented in a participatory and consultative way to ensure that

vulnerable groups such as women, youths, poor men and people living with HIV are engaged, participate and benefit from the programme.

Community level

At community level, water management entities created through the SVTP, will ensure that a certain minimum percentage of women and youths are involved and benefit from the programme equally with men. They will implement affirmative actions on areas where gender gaps are identified. Contractors and consultants will ensure that women, youth and other vulnerable groups are consulted regularly through systematic processes and their views reflected in irrigation designs and specifications. They will create gender capacities within their staff and experts and ensure that all gender and youth issues identified through this guideline are understood and addressed by their teams. This requirement will also be included in their contracts, and the contracts are not engendered, MoAIWD will negotiate for an additional MoU to ensure that gender issues are included. The CCPLTRF Consultant (COWI) will also monitor adherence to the gender strategy, at the feasibility phase.

PERFORMANCE INDICATORS

COWI (2016) has developed performance indicators to monitor gender and youth aspects. At time of monitoring, an independent consultant will be hired to carry out the monitoring as presented hereunder as well as the National Youth Council and the District Council.

Indicators	Type	Method of data collection
Number and frequency of women, men, youths, and other disadvantaged persons consulted during detailed design and implementation	Output	Meetings or process records/registers
Percentage of women and men, boys and girls actively participating in planning sessions for water allocation program for drinking water and agricultural irrigation	Output	Meetings or process records/registers
Percentage of women and men, boys and girls actively participating in water entities	Output	Meetings or process records/registers
Percentage of women and men, boys and girls members of operations and management committees of irrigation projects	Output	Meetings or process records/registers
Women, men, boys and girls and other vulnerable groups in positions of management or leadership in farmer management entities	Output	Meetings or process records/registers
Community satisfaction (disaggregated by gender and age) regarding water distribution schedules and access	Outcome	Household surveys
Access of women and men, boys and girls to support services, such as credit and extension (such as percentage of women in agricultural training and of women clients of credit institutions)	Outcome	Household surveys
Percentage of women and men, boys and girls among total trainees receiving training in the appropriate use of irrigation for high-value crop production	Output	Training reports
Access of landless/vulnerable women and men, boys and girls to water from irrigation schemes	Outcome	Household surveys

Among surveyed women and youths, in target group, percentage rate their access to water for agricultural and domestic use as having improved during the period covered by the program or project	Outcome	Household surveys
Changes in relevant dimensions of well-being, disaggregated by gender, age and wealth group: food and other products, household income, labour and other costs for water conveyance, water quality for drinking, and water quantity for hygiene	Impact	Household surveys

MONITORING

An independent consultant will be hired by PMT to monitor the proposed indicators and work in close collaboration with the Ministry of Gender, Community Development and Children Affairs and the National Youth Council.

9 MONITORING PLAN

This plan summarizes measures that were presented in previous sections. Monitoring of the implementation of the ESMP will draw on the information provided in this chapter. The World Bank will provide support to the project during implementation, with respect to delivering the requirements of the ESMP and undertaking monitoring of the project.

9.1 Responsibilities for implementing measures

The following table provides a summary of actors' responsibility for mitigation, compensation and monitoring. A Summary of performance indicators are presented in the next section. Both will be reviewed and updated as the project progresses and more information becomes available.

Required Measure	Responsible Actor	Description of monitoring	Monitoring actors
Inclusion of Chapter 5 requirements into the Bidding Documents for the Contractor	PMT Procurement, Environment and Social specialists are responsible for ensuring measures set out in Chapter 5 into the Bidding Document and subsequent Contract for the construction contractors.	Self check, internal reviews and sign-off by Project Coordinator of the draft Bidding Documents.	PC, PMT relevant Specialists
Implementation of E&S Requirements set out in the Construction Contract	<p>Construction contractor is fully responsible to budget for and implement the measures in their contract</p> <p>Supervising Engineer Responsible for day to day monitoring of compliance with requirements</p>	<p>Self-Monitoring by Contractor Environmental, Social and Health and Safety Specialists monitor own performance against CESMP and OHSM etc</p> <p>Supervising Engineer Will undertake document reviews and site inspections to confirm works are proceeding in accordance with requirements</p> <p>PMT Environment and social specialists to monitor performance of Supervising Engineer in holding the Contractor to account for delivering the requirements</p>	<p>Environmental, Social and Health and Safety Specialists from Contractor and Supervising Engineer</p> <p>PMT Environment and Social Specialists</p> <p>Government Inspectors from EAD, Ministry of Labour (MoL)</p>

Required Measure	Responsible Actor	Description of monitoring	Monitoring actors
		<p>of the contract, including through undertaking reviews of the contractor performance.</p> <p>Governmental monitoring Governmental monitoring of compliance with national regulation regarding health and safety, workers condition and environmental protection</p>	
Inclusion of Chapter 5 requirements into the Supervising Engineers Terms of Reference	PMT Procurement, Environment and Social specialists are responsible for ensuring measures set out in Chapter 5 are incorporated into the Supervising Engineers Terms of Reference	Self check, internal reviews and sign-off by Project Coordinator of the Terms of Reference.	PC, PMT relevant Specialists
Implementation of the Terms of Reference of the Supervising Engineer	<p>Supervising Engineer is responsible for complying with their Terms of Reference</p> <p>PMT Responsible for monitoring the performance of the Supervising Engineer</p>	<p>Supervising Engineer's reports will be checked by PMT Specialists to ensure that they include details of the measures that the Supervising Engineer has done to ensure Contract is implementing the Contract</p> <p>PMT will undertake site inspections of the works to satisfy themselves that the workers are being undertaken in accordance with the contract</p>	<p>Environment, Social and Health and Safety specialists from Supervising Engineer</p> <p>PMT relevant Specialists</p>
Inclusion of Chapter 5 requirements into the Bidding Documents for the bulk water Operator	PMT Procurement, Environment and Social specialists are responsible for ensuring measures set out in Chapter 5 are incorporated into the	Self check, internal reviews and sign-off by Project Coordinator of the bidding document.	PC, PMT relevant Specialists

Required Measure	Responsible Actor	Description of monitoring	Monitoring actors
	bidding documents for the operator		
Implementation of the E&S Requirements during operation of the canal and associated infrastructure	PMT Responsible for monitoring the performance of the Operator against the requirements of the contract	PMT Specialists to undertake inspections and documentation reviews as necessary to ensure that the operator is complying with the requirements of the contract	PC, Environment, Social and Health and Safety specialists from PMT
Inclusion of Chapter 6 requirements into the Designer's Terms of Reference	PMT Procurement, Design Manager, Environment and Social specialists are responsible for ensuring measures set out in Chapter 6 are incorporated into the Designers Terms of Reference	Self check, internal reviews and sign-off by Project Coordinator of the Terms of Reference.	PC, PMT relevant Specialists
Implementation of requirements set out in the Designers Terms of Reference	The Designer's team will implement Environmental Design Management Procedures to ensure that all issues are adequately incorporated into the design. PMT specialists will confirm requirements have been met	Self-Monitoring by Designer Environmental, Social and Health and Safety Specialists will follow the EDM Procedures to ensure the timely incorporation of issues PMT Will review designs and the solutions to confirm all issues have been incorporated	Environmental, Social and Health and Safety Specialists from Designer PMT Specialists
Compensating for impacts to Lengwe National Park – Monitoring Chapter 7	The Compensation measures described in Chapter 7 will be delivered to DNPW, commensurately with the delivery of the relevant services, and on presentation of compliant invoices	PMT PMT will agree the timescales for the delivery of the compensation payments with DNPW, taking into account the program of services to be provided by DNPW. Where necessary this will need to reflect the construction program	PMT Environment Specialist DNPW

Required Measure	Responsible Actor	Description of monitoring	Monitoring actors
<p>Establishing and operation of Command Areas to ensure design requirements from Chapter 6 are incorporated in farm set up and operation, including:</p> <p>No impacts to natural habitat Archaeology is rescued PMP requirements are delivered Farm H&S plan is prepared and implemented Energy and resource (water) use efficiency is considered</p>	<p>PMT will ensure relevant TORs (SOCFE Development Service Provider; Investment Assessment Panel; Farm Managers) contain relevant provisions</p>	<p>Self check, internal reviews and sign-off by Project Coordinator of the Terms of Reference.</p> <p>PMT will submit to World Bank for their review and no-objection the TORs.</p> <p>PMT to monitor the work of the specialists and ensure requirements of the TOR are being delivered.</p>	<p>PC, PMT relevant Specialists</p>
<p>Screening of projects under Natural Resources Management Component, including fish ponds</p>	<p>PMT Natural Resource Management Coordinator will be responsible to organizing the screening of all projects</p>	<p>PMT: PMT Environment and Social Specialists will check and review the screening forms prior to submission to PMT PC. PMT PC will sign off on the screening.</p>	<p>PMT specialists PC</p>
<p>Waste Management Planning – preparation and implementation of TORs</p>	<p>PMT will prepare TORs for the Waste Management Planning study</p> <p>PMT to appoint appropriately skilled specialist to implement the TOR and to prepare the study outputs.</p>	<p>Self check, internal reviews and sign-off by Project Coordinator of the Terms of Reference, of the proposed specialists CV, and of the study outputs.</p> <p>PMT will submit to World Bank for their review and no-objection to the TOR, to the proposed specialist, and to the outputs of the study</p>	<p>PC, PMT relevant Specialists</p>
<p>HS Training – Farm and water related health issues, including Schistosomiasis and</p>	<p>MoH specialists will undertake research, identification and</p>	<p>PMT: PMT Environment and Social Specialists will monitor the</p>	<p>PMT Specialists</p>

Required Measure	Responsible Actor	Description of monitoring	Monitoring actors
communicable diseases	sensitization campaigns	delivery of services and of educational campaigns	
HS Training of community and workers – Safety on construction sites, near canals and on farm safety	OHS specialists will prepare and deliver training and awareness raising campaigns, according to the TOR prepared by PMT	PMT: Having prepared TORs for the trainings and awareness raising, PMT Environment and Social Specialists will monitor the roll out of the programs	OHS Specialists, PMT Specialists
Engaging with Law Enforcement	PMT will request regular attendance of law enforcement	PMT: PMT Social Specialist will monitoring the presence of Law Enforcement at GBV trainings	PMT Social Specialist
Project GRM	PMT Social Specialist will be responsible for the publication and smooth running of the project GRM	PMT: Self check by PMT Social Specialist Monthly reports to PC	PC, PMT Social Specialist
Archaeology and Cultural Heritage rescue in advance of construction	PMT will engage DoA to undertake rescue of artefacts from high priority sites prior to construction	PMT: Environment Specialist will ensure the TOR for the advanced rescue operations accord with the ESMP. Environment Specialist will monitor the delivery of the service	DoA, PMT
Action Plan for Gender and Youth	PMT Social Specialist will coordinate and promote these activities amongst the actors	PMT: Will set up regular meetings with actors and prepare reports of the activities undertaken.	PMT, Consultants, District Councils, MoAIWD, National Youth Council, farmer organisations, various other departments and institutions

9.2 SUMMARY OF PERFORMANCE INDICATORS

The following table summarizes the performance indicators to indicate the performance of the mitigation. These will be reviewed and updated as the project progresses to ensure they remain pertinent.

Mitigation Measure	Performance indicators
Implementation of the ES Requirements during construction (chapter 5)	<ol style="list-style-type: none"> 1. The number of non-compliances with contract, by subject (e.g. amount of unplanned: vegetation removal; emissions to land, air and water) 2. The timescale for remedying non-compliance 3. Monthly reports from the contractor providing metrics required in Part D of the Particular Conditions of Contract
Inclusion of the measures from chapter 6 included in the detailed design	<ol style="list-style-type: none"> 1. The number/amount of each feature type included in the design for construction drawings, compared with the estimates/requirements in the ESMP 2. The number of hectares set aside as non-irrigated areas (because of their environmental features or designated community uses) in Command Areas
Compensation Payments to LNP	<ol style="list-style-type: none"> 1. The amount and timing of the payments, by reference to the ESMP requirements 2. Wildlife Monitoring Reports 3. Number of complaints from Contractor for absence of rangers
Screening of NRM Projects prior to implementation	<ol style="list-style-type: none"> 1. Number of Screenings undertaken 2. Number of ESAs, ESMPs and CESMPs prepared 3. Number of non-compliances raised by EAD
Preparation of ESMP for Chikwawa Water Supply	<ol style="list-style-type: none"> 1. Preparation of approved (EAD) ESMP 2. Preparation of approved (Supervising Engineer) CESMP 3. Monthly reports from the contractor providing metrics required in Part D of the Particular Conditions of Contract
Waste Management TORs	<ol style="list-style-type: none"> 1. TORs contain reference to relevant parts of World Bank ESF
Health Training, including – Schistosomiasis	<ol style="list-style-type: none"> 1. The evolution of number of infections of schistosomiasis
HS Training – Farm and Canal Safety	<ol style="list-style-type: none"> 1. Number of Trainings given (target 2 per month) 2. Information packs prepared and disseminated
Engaging with Law Enforcement	<ol style="list-style-type: none"> 1. Number of project events per month attended by law enforcement
Project GRM	<ol style="list-style-type: none"> 1. Performance indicators are described in the Grievance Redress Mechanism (GRM)
Archaeology and Cultural Heritage pre construction works	<ol style="list-style-type: none"> 1. The number of salvaged high priority sites 2. The number of unexpected finds

Action Plan for Gender and Youth	<ol style="list-style-type: none"> 1. Number and frequency of women, men, youths, and other disadvantaged persons consulted during Design study and implementation 2. Percentage of women and men, boys and girls actively participating in planning sessions for water allocation program for drinking water and agricultural irrigation 3. Percentage of women and men, boys and girls actively participating in water entities 4. Percentage of women and men, boys and girls members of operations and management committees of irrigation projects 5. Women, men, boys and girls and other vulnerable groups in positions of management or leadership in farmer management entities 6. Community satisfaction (disaggregated by gender and age) regarding water distribution schedules and access 7. Access of women and men, boys and girls to support services, such as credit and extension (such as percentage of women in agricultural training and of women clients of credit institutions) 8. Percentage of women and men, boys and girls among total trainees receiving training in the appropriate use of irrigation for high-value crop production 9. Access of landless/vulnerable women and men, boys and girls to water from irrigation schemes 10. Among surveyed women and youths, in target group, percentage rate of their access to water for agricultural and domestic use as having improved during the period covered by the program or project 11. Changes in relevant dimensions of well-being, disaggregated by gender, age and wealth group: food and other products, household income, labour and other costs for water conveyance, water quality for drinking, and water quantity for hygiene
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9.3 Reporting implementation Performance of the ESMP

PMT will prepare reports on the implementation of the ESMP in accordance with the project agreements. This will include details of the actions undertaken by actors as part of the implementation measures, together with details of performance indicators that had been measured in the reporting period.

PMT will forward monthly progress reports for each construction contract to WB, when received from Supervising Engineer/Contractor.

ANNEX 1: SCREENING PROCESS OF OTHER MEASURES (CHAPTER 8), PROJECT CONSTRUCTION CAMPS, QUARRIES, BORROWER AREAS, AND COMMAND AREAS

This annex describes the processes for screening the Other Measures described in Chapter 8 against World Bank requirements, and for screening project activities against National Requirements. The Other measures described in Chapter 8 refer mostly to small scale activities that were not fully defined and described within the ESIA for SVTP-II. These will tend to be minor community level activities that might be undertaken within the Lower Shire Valley, but not by the main contractors engaged to undertake the works associated with the canal and irrigation infrastructure. Project construction sites that will also be subject to this screening include contractor camps, quarries, borrow pits and disposal areas that are part of the Contractor Design (and therefore not included in the Project Design).

Introduction to the Screening Process

The key to environmental management for the SVTP is to determine the appropriate studies and follow-up measures that might be needed. The screening process presented here is designed to meet World Bank requirements and the Malawi Guidelines for Environmental Impact Assessment. The objectives of the screening process for subprojects is to:

- Determine which construction and rehabilitation activities have potential negative environmental and social impacts;
- Determine the level of environmental analysis and follow-up environmental or social management work required;
- Determine appropriate mitigation measures for addressing adverse impacts;
- Incorporate mitigation measures into sub-project construction contracts and operation process;
- Facilitate the review and approval of the construction and rehabilitation proposals and;
- Provide guidance for environmental and social compliance and outcome monitoring of environmental parameters during construction, rehabilitation, operation and maintenance of Project-supported facilities and related project activities.

The extent of environmental or social work that might be required, prior to the commencement of construction and rehabilitation of the facilities, will depend on the outcome of the screening process described below.

Malawi's Guidelines for EIA (1997) provide for categorization of projects into either List A or List B depending on the size, nature and perceived environmental consequences of a project. Where it is clear that project activities fall under List A of the Guidelines, an EIA has to be carried out. The screening process will be used to determine the appropriate environmental follow-up measures, depending on the nature, scope and significance of the expected environmental impacts from each SVTP-supported sub-project. The Environmental and Social Screening Form (ESSF) to be used for screening in accordance with Malawi Guidelines for EIA is provided in Annex 2 and will be completed by trained and qualified personnel. The screening form, when correctly completed, will facilitate the:

- Identification of potential environmental and social impacts and their significance;
- Assignment of the appropriate environmental category;

- Determination of appropriate environmental and social mitigation measures and;
- Need to conduct an ESIA and or prepare Resettlement Action Plans (RAPs) where required.

Screening will be responsibility of the PMT with collaboration of the District Environmental Officer. Subsequent to a desk appraisal of the construction and rehabilitation plans, the initial screening of the proposed project activities will be carried out in the field, using the Environmental and Social Screening Form. The ESSF, when completed, will provide information for the assignment of the appropriate environmental category to a particular activity for rehabilitation and/or construction of new facilities. The District Environmental Committee (for the District Council) will be responsible for categorizing a construction or rehabilitation activity as either A, B or C.

Category A project activities would have significant and long-term adverse environmental impacts and therefore would require an EIA, in accordance with Malawian legal requirements. Although some quarries, disposal sites or borrow pits may fall into category A, the Other Measures described in Chapter 8 are expected to be category B or C. Category B projects are those with one or a few potentially significant adverse impacts, which would require an Environmental and Social Management Plan to address specific impacts during project construction or operation, but not a full EIA. Category C projects would not have any significant adverse environmental impacts; they would therefore not require an ESIA or a specific ESMP, but they would require adherence to good environmental practices, including any applicable Environmental Rules for Contractors.

If the ESSF has only “No” entries, then a C classification would normally be warranted. Hence, the proposed activity will not require further environmental analysis, and the DEC will recommend approval of the screening results for implementation of the project activity to proceed—subject to adherence to environmental and social requirements, such as the Environmental Rules for Contractors, during any civil works.

After reviewing the information provided in the ESSF and having determined the appropriate environmental category, the PMT will determine whether:

- The application of simple mitigation measures outlined in the ESSF (Annex 3) and Environmental and Social Rules for Contractors will suffice (Category C);
- An Environmental and Social Management Plan (ESMP) needs to be prepared to address specific environmental and social impacts (Category B); or (c)A full ESIA will need to be carried out for actions in (Category A).

Although this screening process includes potential Category A sub-projects, none are expected. Though not highly likely, it is conceivable that, as a result of the screening process, one or more of the sub-projects will be found to require an ESIA. In such a case, the ESIA would identify and assess the potential environmental impacts of the proposed construction activities, evaluate alternatives, as well as design and implement appropriate mitigation, management and monitoring measures. These measures would be captured in the Environmental and Social Management Plan (ESMP) which will be prepared as part of the ESIA report.

The DEC will review the results and recommendations of the environmental and social screening forms; and the proposed mitigation measures presented in the environmental and social checklists. Where an

ESIA has been carried out, EAD will review the reports to ensure that all environmental and social impacts have been identified and that effective mitigation measures have been proposed.

Based on the results of the above review process and discussions with the relevant stakeholders and potentially affected persons, the DEC, in case of projects that don't require EIA, will make recommendations to the District Council and PMT to go ahead with project implementation. Where an ESIA is required the District Council will recommend to SVTP and EAD for the EIA study. After preparation of the ESIA report, EAD (on advice from the Technical Committee on Environment, TCE) will recommend to the National Council on Environment (NCE) for its approval.

To ensure that the screening form is completed correctly for the various project locations and activities, training will be provided to members of the DEC. The PMT Environmental Officer will have to take a leading role in the training. Technical advice on environmental and social training will also be provided by a contracted safeguards specialist on the PMT.

Annex 3 includes a World Bank ESF Screening Form, which will be used in parallel with the above process to determine whether the activity would result in high, substantial, moderate or low environmental or social risks, and whether an ESMP or ESIA is required. If an ESMP or ESIA is required, then it will be provided to the World Bank for review prior to the start of the activity.

ANNEX 2: ENVIRONMENTAL AND SOCIAL SCREENING FORM



Government of the Republic Of Malawi

Ministry of Mines, Natural Resources and Environment

ENVIRONMENTAL AND SOCIAL SCREENING FORM

FOR

SCREENING OF POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS OF THE SHIRE VALLEY TRANSFORMATION PROGRAM

INTRODUCTION

This Environmental and Social Screening Form (ESSF) has been designed to assist in the evaluation of planned construction and rehabilitation activities under the SVTP. The form will assist the project implementers and reviewers to identify environmental and social impacts and their mitigation measures, if any. It will also assist in the determination of requirements for further environmental work (such as ESIA), and social work if necessary.

The form helps to determine the characteristics of the prevailing local bio-physical and social environment with the aim of assessing the potential impacts of the construction and rehabilitation activities on the environment by the SVTP. The ESSF will also assist in identifying potential socio-economic impacts that will require mitigation measures and/or resettlement and compensation.

GUIDELINES FOR SCREENING

The evaluator should undertake the assignment after:

- gaining adequate knowledge of baseline information of the area.
- gaining knowledge of proposed project activities for the area.
- having been briefed/trained in environmental and social screening.

The form is to be completed by consensus of at least professional officers from Environmental Affairs department, knowledgeable of the screening process.

PART A: GENERAL INFORMATION

Project Name	Estimated Cost (MK)
Project Site	Funding Agency
Project Objectives	Proposed Main Project Activities
Name of Evaluator	Date of Field appraisal

PART B: BRIEF DESCRIPTION OF THE PROPOSED ACTIVITIES

Provide information on the type and scale of the construction/rehabilitation activity (e.g. area, land required and approximate size of structures).

Provide information on the construction activities including support/ancillary structures and activities required to build them, e.g. need to quarry or excavate borrow materials, water source, access roads etc.

Describe how the construction/rehabilitation activities will be carried out. Include description of support/activities and resources required for the construction/rehabilitation.

PART C: ENVIRONMENTAL BASELINE INFORMATION OF THE PROJECT SITE

CATEGORY OF BASELINE INFORMATION	BRIEF DESCRIPTION
GEOGRAPHICAL LOCATION <ul style="list-style-type: none"> • Name of the Area (District, T/A, Village) • Proposed location of the project (Include a site map of at least 1:10,000 scale) 	
LAND RESOURCES <ul style="list-style-type: none"> • Topography and Geology of the area • Soils of the area • Main land uses and economic activities 	
WATER RESOURCES <ul style="list-style-type: none"> • Surface water resources (e.g. rivers, lakes, etc) quantity and quality • Ground water resources quantity and quality 	
BIOLOGICAL RESOURCES <ul style="list-style-type: none"> • Flora (include threatened/endangered/endemic species) • Fauna (include threatened/endangered/endemic species) • Sensitive habitats including protected areas e.g. national parks and forest reserves 	
CLIMATE <ul style="list-style-type: none"> • Temperature • Rainfall 	

PART D: SCREENING CRITERIA FOR IMPACTS DURING CONSTRUCTION

	AREAS OF IMPACT			IMPACT EVALUATION						POTENTIAL MITIGATION MEASURES
	Is the project site/activity within and/ or will it affect the following environmentally sensitive areas?			Extent or coverage (on site, within 3km -5km or beyond 5km)			Significance (Low, Medium, High)			
1.	No	Yes		On Site	Within 3-5 km	Beyond 5km	Low	Medium	High	
1.1										
1.2										
1.3										
1.5										
1.6										
1.7										
1.8										
1.9										
1.10										
1.11										
1.12										

1.1 3	Within prime ground water recharge area									
1.1 4	Within prime surface run off									
1.1 5	Near boreholes or other potable drinking water sources									

2.0 SCREENING CRITERIA FOR IMPACTS DURING IMPLEMENTATION AND OPERATION

	AREAS OF IMPACT		IMPACT EVALUATION							POTENTIAL MITIGATION MEASURES
	Will the implementation and operations of the project activities within the selected site generate the following externalities /costs /impacts?		Extent or coverage (on site, within 3km -5km or beyond 5km)			Significance (Low, Medium, High)				
	No	Yes	On Site	Within 3-5 km	Beyond 5km	Low	Medium	High		
2.1	Deforestation									
2.2	Soil erosion and siltation									
2.3	Siltation of watercourses, dams									
2.4	Environmental degradation arising from mining of construction materials									
2.5	Damage of wildlife species and habitat									
2.6	Pollution from Pesticides									
2.7	Nuisance - smell or noise									

2.8	Reduced water quality									
2.9	Increase in costs of water treatment									
2.10	Soil contamination									
2.11	Loss of soil fertility									
2.12	Reduced flow and availability of water									
2.13	Long term depletion of water resource									
2.14	Incidence of flooding									
2.15	Changes in migration patterns of animals									
2.16	Introduce alien plants and animals									
2.17	Increased incidence of plant and animal diseases									

3.0 SCREENING CRITERIA FOR SOCIAL AND ECONOMIC IMPACTS										
	AREAS OF IMPACT				IMPACT EVALUATION					
	Will the implementation and operation of the project activities within the selected site generate the following socio-economic costs/impacts?				Extent or coverage (on site, within 3km -5km or beyond 5km)			Significance (Low, Medium, High)		
		No	Yes		On Site	Within 3-5 km	Beyond 5km	Low	Medium	High
3.1	Loss of land/land acquisition for human settlement, farming, grazing									

3.2	Loss of assets, property- houses, agricultural produce etc								
3.3	Loss of livelihood								
3.4	Require a RAP								
3.5	Loss of cultural sites, graveyards, monuments ¹								
3.6	Disruption of social fabric								
3.7	Interference in marriages for local people by workers								
3.8	Spread of STIs and HIV and AIDS, due to migrant workers								
3.9	Increased incidence of communicable diseases								
3.10	Health hazards to workers and communities								
3.11	Changes in human settlement patterns								
3.12	Conflicts over use of natural resources e.g. water, land, etc								
3.13	Conflicts on land ownership								
3.14	Disruption of important pathways, roads								
3.15	Increased population influx								
3.16	Loss of cultural identity								
3.17	Loss of income generating capacity								

OVERALL EVALUATION OF THE SCREENING PROCESS ON THE SITE AND PROJECT ACTIVITY

The result of the screening process would be either (i) the proposed project would be permitted to proceed on the site, provided that standard good environmental and social practices are followed during project construction and operation, including the Environmental Rules for Contractors (typically Category C); (ii) the proposed project would need its own specific Environmental and Social Management Plan (ESMP), but not a separate ESIA; or (iii) the proposed project would need its own ESIA (including an ESMP), with the ESIA subject to review by Malawi’s Environmental Affairs Department.

Some examples are provided in the table below:

1NOTE: Sub-projects affecting cultural property negatively will either require specific institutional arrangements to be followed for funding or will not be funded depending on the location of the project

The Proposed Project Activity Can Be Exempted From ESIA and/or DNPW Requirements On The Following.	The Proposed Project Activity Needs an ESMP and possibly also an ESIA.
<input type="checkbox"/> Screening indicates that the site of the project will not be within environmentally-sensitive areas .e.g. protected areas	<input type="checkbox"/> Field appraisals indicate that the project site is within environmentally –sensitive areas, protected areas.
<input type="checkbox"/> No families will be displaced from the site	<input type="checkbox"/> Cause adverse socio-economic impacts
<input type="checkbox"/> Identified impacts are minor, marginal and of little significance	<input type="checkbox"/> Significant number of people, families will be displaced from site
<input type="checkbox"/> Mitigation measures for the identified impacts are well understood and practiced in the area	<input type="checkbox"/> Some of the predicted impacts will be long term, complicated, extensive
<input type="checkbox"/> The stakeholders have adequate practical experiences in natural resource conservation and management.	<input type="checkbox"/> appropriate mitigation measures for some predicted impacts are not well known in the area

Completion by EDO, or EO	
Is This Project Likely To Need An EIA	YES/ NO
List A/B Paragraph Numbers	
Date Exempted	
Date Forwarded To PMT PC	
Name & Signature of EDO	

Completion by Director of Environmental Affairs	
Date Received :	
Dated Reviewed by E Specialist:	
Dated Reviewed by S Specialist:	
Returned for further information	YES/ NO
Approved date	

NOTES:

- Once the Environmental and Social Screening Form is completed by the PMT it is analysed by experts from the District Environmental Sub-Committee who will classify it into the appropriate category based on a predetermined criteria and the information provided in the form.
- The Environmental and Social Screening Form(ESSF) of the World bank will be filled by the safeguards team in the PMT including the NRMCC, where applicable, and signed off by the PC.
- All projects’ proponents exempted from further impact assessment must be informed to proceed with other necessary procedures.
- All projects recommended for a specific EIA will have to follow the procedures outlined in section 24 and 25 of the Environmental Management Act, and the Malawi Government’s Guidelines for Environmental Impact Assessment appendix C, page 32.

ANNEX 3: ENVIRONMENTAL AND SOCIAL FRAMEWORK SCREENING FORM

This World Bank ESF Screening Form will be used to determine whether any proposed activity would result in high, substantial, moderate or low environmental or social risks, and whether an ESMP or ESIA is required. If an ESMP or ESIA is required, then it will be provided to the World Bank for review prior to the start of the activity.

1. Activity Brief Description

Activity name:	
Activity Location (include map/sketch):	(e.g. WMZ, District, etc.).
Type of activity:	(e.g. new construction, rehabilitation, periodic maintenance)
Estimated Cost: (x)	
Proposed Date of Commencement of Activity:	
Site area in ha	
Extension of or changes to existing alignment	
Feasibility Study, Technical Drawing/Specifications Reviewed:	(circle answer): Yes No

This report is to be kept short and concise.

2. Sensitivity of the Project

Issues	Site Sensitivity			
	Very Low	Low	Medium	High
Natural habitats	No natural habitats present of any kind	No critical natural habitats or other natural habitats	Receptor has a limited capacity to accommodate physical or chemical changes or influences	Critical natural habitats present
Water quality and water resource availability and use	Project activities does not need use of available water resource	Water flows exceed any existing demand; low intensity of water use; potential water use conflicts expected to be low; no potential water quality issues	Medium intensity of water use; multiple water users; water quality issues are important	Intensive water use; multiple water users; potential for conflicts is high; water quality issues are important
Natural hazards vulnerability, floods, soil, stability/ erosion	No known volcanic/seismic/ flood risks	Flat terrain; no potential stability/erosion problems;	Medium slopes; some erosion potential; medium risks from volcanic/seismic/ flood/ hurricanes	Mountainous terrain; steep slopes; unstable soils; high erosion potential; volcanic, seismic or flood risks
Cultural Heritage	No known or suspected cultural heritage (Tangible and intangible).	Suspected cultural heritage sites; known heritage sites in broader area of influence	Known heritage sites in Project area that shall have interaction with the project activities	Known heritage sites in Project area which can be affected by project activities.

Issues	Site Sensitivity			
	Very Low	Low	Medium	High
Stakeholder engagement	The stakeholders are in support of the project and have been well engaged.	Stakeholders are in support of the project but do not have not been well engaged	Some of stakeholders are in agreement with the project while another group is not.	Stakeholders are not well engaged or not in agreement with the proposed project activities

3. Checklist of environmental and social impacts in various project activities

Activity	Potential for Adverse Impacts				
	None	Low	Moderate	High	Unknown
New access (road) construction					
Wet season soil disturbance					
Potential for debris flows or landslides					
Sensitive downstream ecosystems					
Removal of native plant/tree species					
Introduced plant/tree species					
Invasion of native species					
Wildlife habitats or populations disturbed					
Environmentally sensitive areas disturbed					
Insufficient capacity to manage catchment ponds					
Insufficient capacity to prohibit or control open grazing					
Insufficient capacity to manage new plantations/pastures					
Use of pesticides					
Soil erosion or flooding concerns (e.g., due to highly erodible soils or steep gradients)					
Number of stream crossings or disturbances					
Wet season excavation					
Creation of quarry sites or borrow pits					
Significant vegetation removal					
Wildlife habitats or populations disturbed					
Environmentally sensitive areas disturbed					
Cultural or religious heritage ((Tangible and intangible).					
New settlement pressures created / Access protection					
Alteration of existing drainage conditions					
Vegetation removal					
Wet season soil disturbance					
Construction materials impact on adjacent forests/lands					
Quarries and borrow pits created					

Cultural or religious sites disturbed					
Water supply development effects in available supply					
Effect of sanitation development on existing disposal sites					
In-migration/settlement induced by facilities development					
Local incapacity/inexperience to manage facilities					
Labor influx					
Other (specify):					

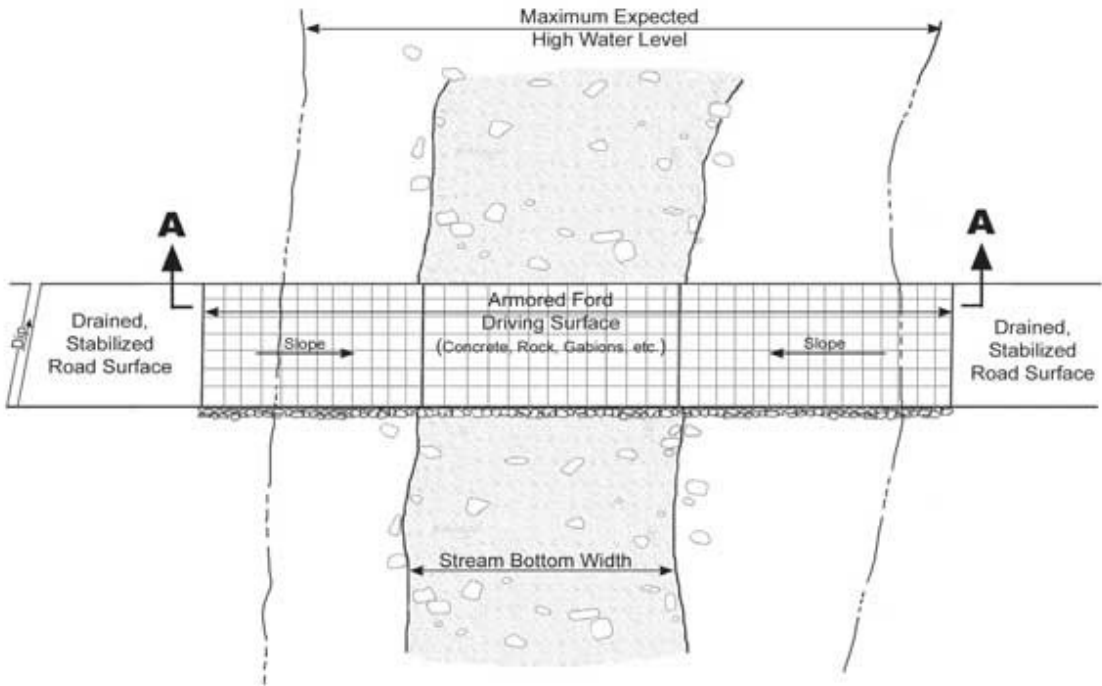
Preliminary Environmental Information:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
State the source of information available at this stage (proponents report, environmental study, field survey).	
Has there been litigation or complaints of any environmental nature directed against the proponent or activity	
Refer to application and/or relevant environmental authority for this information.	
Identify type of activities and likely environmental impacts:	Bullet lists preferred except where descriptive detail is essential.
Which ESF ESS are relevant, and what issues need to be considered?	
Determine environmental screening category:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
After compiling the above, determine which category the sub-project falls under based on the environmental categories High, Substantial, Moderate or Low. (the highest category will apply)	
Mitigation of Potential Pollution:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
Does the Activity have the potential to pollute the environment, or contravene any environmental laws and regulations?	
Will the Activity require pesticide use?	
Does the design adequately detail mitigating measures?	
If screening identifies environmental issues that require an ESIA or a study, does the proposal include the ESIA or study?	
Indicate the scope and time frame of any outstanding environmental study.	
Required Environmental Monitoring Plan:	
If the screening identifies environmental issues that require long term or intermittent monitoring (effluent, water quality, soil quality, air quality, noise etc), does the proposal detail adequate monitoring requirements?	

Preliminary Environmental Information:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
Public participation/information requirements:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
Does the proposal require, under national or local laws and the project Stakeholder Engagement Plan, the public to be informed, consulted or involved?	
Has consultation been completed?	
Indicate the time frame of any outstanding consultation process.	
Refer to relevant legislative acts in Uganda.	
Land and resettlement: Will the project affect access to forest areas and wildlife resources?	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
What is the plot currently being used for? (e.g. agriculture, gardening, etc) List the key resources.	
Labour influx	
List outstanding actions to be cleared before Activity approval for financing	
Approval/rejection	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
If proposal is rejected for E&S reasons, should the activity be reconsidered, and what additional data would be required for reconsideration?	

Recommendations

Requires an ESIA to be submitted on date:
Requires addressing livelihoods restoration activities
Requires an ESMP to be submitted on date:
Does not require further environmental or social studies and activity can proceed
Reviewer: Name: Signature:
Date:

ANNEX 4: INDICATIVE DESIGN FOR IRISH CROSSING



PLAN VIEW

