



**THE GOVERNMENT OF THE REPUBLIC OF MALAWI
MINISTRY OF WATER DEVELOPMENT AND IRRIGATION**

SHIRE RIVER BASIN MANAGEMENT PROGRAMME (PHASE I) PROJECT

**FINAL ENVIRONMENTAL
AND SOCIAL MANAGEMENT FRAMEWORK REPORT**

NOVEMBER 2012



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REPORT**

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Client

Ministry of Water Development and Irrigation
Tikwere House
Private Bag 390
Lilongwe 3
MALAWI
Tel. (265) 1 770 344/ 221
Fax: (265) 1 773 737

Consultant

Water, Waste and Environment
Tep-Tech Building
Opposite Area 3 Mobil Filling Station
P.O. Box 31271
Lilongwe 3, MALAWI
Tel: (265) 1 750 094
Cell (265) 8 8831 595
Email: kafatiakent@yahoo.co.uk

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LIST OF ACCRONYMS

ADD	Agricultural Development Division
AEC	Area Executive Committee
AIDS	Acquired Immuno Deficiency Syndrome
APM	African Parks Majete
ART	Anti Retroviral Therapy
BOD	Biochemical Oxygen Demand
BWB	Blantyre Water Board
CA	Conservation Agriculture
CCA	Community Conservation Area
CBD	Convention on Biological Diversity
CBOs	Community Based Organizations
CBNRM	Community Based Natural Resource Management
CBRLDP	Community Based Rural Land Development Programme
CIG	Common Interest Group
CITES	Convention on International Trade in Endangered Species
COD	Chemical Oxygen Demand
CRWB	Central Region Water Board
CSO	Civil Society Organization
DADO	District Agriculture Development Officer
DANIDA	Denmark International Development Aid
DC	District Council
DDC	District Development Committee
DODMA	Department of Disaster Management Affairs
DEA	Director of Environmental Affairs
DEAP	District Environmental Action Plan
DEC	District Executive Committee
DEM	Digital Elevation Model
DESC	District Environmental Sub-committee
DNRDM	Department of National Relief and Disaster Management
DOE	Department of Energy
DPD	Director of Planning and Development
DRM	Disaster Risk Management
DSS	Decision Support System
EA	Environmental Assessment
EAD	Environmental Affairs Department
EAM	Evangelical Association of Malawi
EDO	Environmental District Officer
EIA	Environmental Impact Assessment
EMA	Environment Management Act
EMP	Environmental Management Plan
ESA	Environmental and Social Assessment
ESCOM	Electricity Supply Corporation of Malawi
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Impact Assessment Report
ESSF	Environmental and Social Screening Form
FAO	Food and Agriculture Organisation
FCMA	Fisheries Conservation and Management Act
FEWS	Flood Early Warning System
FBOs	Faith Based Organisations
GEF	Global Environmental Facility

GFDRR	Global Facility for Disaster Reduction and Recovery
GIS	Geographical Information System
GoM	Government of Malawi
GSM	Global System for Mobile Communication
HIV	Human Immune Deficiency Virus
IDA	International Development Agency
IGA	Income Generating Activities
IFRMP	Integrated Flood Risk Management Plan
IPM	Integrated Pest Management
ITCZ	Inter-Tropical Convergence Zone
JLC	Joint Liaison Committee
MWRA	Majete Wildlife Reserve Association
MIS	Management Information System
M&E	Monitoring and Evaluation
MAFS	Ministry of Agriculture and Food Security
MGCSW	Ministry of Gender, Children and Social Welfare
MoLH	Ministry of Lands and Housing
MSTT	Multi-sector Technical Team
MTPW	Ministry of Transport and Public Works
MWDI	Ministry of Water Development and Irrigation
MGDS	Malawi Growth and Development Strategy
NAC	National Aids Commission
NCE	National Council on the Environment
NEAP	National Environmental Action Plan
NEP	National Environmental Policy
NGOs	Non-Governmental Organizations
NRM	Natural Resources Management
NRSC	National Roads Safety Council
NRWB	Northern Region Water Board
NSO	National Statistical Office
NLP	National Land Policy
NWDP	National Water Development Programme
OP	World Bank Operational Policy
PA	Public Address
PAP	Project Affected Person
PCB	Pesticides Control Board
PF	Process Framework
PIU	Project Implementation Unit
PMCT	Prevention of Mother Child Transmission
PPA	Project Preparation Advance
PRA	Participatory Rural Appraisal
PS	Permanent Secretary
PVA	Participatory Vulnerability Assessments
RAP	Resettlement Action Plan
RGS	River Gauging Station
RPF	Resettlement Policy Framework
RPF+PF	Resettlement Policy Framework with Process Framework
SADC	Southern Africa Development Community
SESA	Strategic Environmental and Social Assessment
SLWM	Sustainable Land and Water Management
SOER	State of the Environment Report
SRBMP	Shire River Basin Management Project
SRWB	Southern Region Water Board

TA	Traditional Authority
TCE	Technical Committee on the Environment
TCPC	Town and Country Planning Committee
TORs	Terms of References
SESA	Strategic Environmental and Social Assessment
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate
VCT	Voluntary Testing and Counselling
VDC	Village Development Committee
WB	World Bank
WWEC	Water, Waste and Environment Consultants
WRA	Water Resources Area

ACKNOWLEDGEMENT

This Environmental and Social Management Framework Report (ESMF) has been prepared with the support and consultation of many people to whom Water, Waste and Environment Consultants are very grateful.

The people consulted include workers and communities in the Shire River Basin where the proposed project activities will be implemented. The places include districts, cities and towns of Ntcheu, Mangochi, Machinga, Balaka, Liwonde, Zomba, Blantyre, Mwanza, Thyolo, Chikhwawa and Nsanje.

District officials including District Commissioners, members of District Executive Committees and Town and Country Planning Committees, Environmental District Officers, Chiefs and the general public provided valuable input to this study.

In addition, a number of senior officers in the Ministry of Water Development and Irrigation, Environmental Affairs Department, Energy Department, Forestry Department and the Ministry of Local Government and Rural Development provided considerable administrative and logistical support during the assignment.

EXECUTIVE SUMMARY

This Environmental and Social Management Framework (ESMF) has been prepared for the Shire River Basin Management Project (SRBMP), which the Government of the Republic of Malawi will be implementing through the Ministry of Water Development and Irrigation. The purpose of this ESMF is to guide the integration of environmental and social considerations in the planning and implementation of the SRBMP activities.

The Government of Malawi has received a Project Preparation Advance (PPA) on the proceeds of a credit from the International Development Agency (IDA) of the World Bank, to finance the preparation of the SRBMP. The World Bank plans to assist the Government of Malawi with the financing of this Project, as part of a longer term Program (12-15 years – for which the SRBMP is the first phase of about 5.5 years).

The overall Program development objective is to increase sustainable social, economic and environmental benefits by effectively and collaboratively planning, developing and managing resources within the Shire River Basin. Specific objectives for the project include to: (i) strengthen the institutional capacities and mechanisms for Shire River Basin monitoring, planning, management and decision support systems; (ii) invest in water related infrastructures that sustainably improve water resources management and development; (iii) reduce erosion in priority catchments and sedimentation and flooding downstream, while enhancing environmental services, agricultural productivity and improving livelihoods; (iv) improve flood management in the Lower Shire and provide community level adaptation and mitigation support; and (v) protect and enhance ecological services in the Basin.

The SRBMP has three components: Component A - Shire River Basin Planning, which lays the foundation for more integrated investment planning and modernized system operations for the Shire River Basin; Component B - Catchment Management, which is aimed at rehabilitating some targeted catchments within the basin, in order to manage erosion and improve livelihoods within the basin; and Component C - Water Related Infrastructure, aimed at developing critical infrastructure to improve regulation of Shire River flows and strengthen climate resilience.

The SRBMP aims to assist approximately 430, 000 people within the basin through integrated catchment rehabilitation activities, improved water management, and flood mitigation works. The first Project is expected to involve an investment of about US\$145 million and will be implemented over five and half years.

This ESMF has been designed to guide the determination of appropriate level of environmental management, in all stages of the project cycle, from planning to implementation. The Project is designed with environmental sustainability in mind, for all the components and activities. Environmental considerations will be given prominent attention in Shire River Basin planning, as well as major civil works, to ensure that any adverse environmental impacts are minimized and/or adequately mitigated. The ESMF has been prepared as a guide to the screening of the proposed SRBMP sites and activities, for negative environmental and social impacts, which would require attention prior to project implementation. The ESMF outlines a number of strategies, which include:

- A systematic procedure for participatory screening of project sites and project activities for environmental and social considerations;
- A step by step procedure for forecasting the main potential environmental and social impacts of the planned project activities;
- A typical environmental management and monitoring plan for addressing negative externalities in the course of project implementation, operations within environs, and for monitoring and evaluation of implementation of mitigation measures; and

- An outline of recommended capacity building measures for environmental planning and monitoring of the project activities.

Although the SRBMP activities will vary in size, location, scope and approach to implementation, project components B and C will generate most of the negative environmental and social impacts while component A will generate positive environmental and social impacts. Key generic environmental and social impacts to be generated by project activities include:

Key Generic Positive Impacts:

- Improved reporting on comprehensive state of the Shire River Basin;
- Improved information systems and knowledge base on Shire River Basin Management Project;
- Reduction in run-off, soil erosion and siltation in the Shire River basin;
- Increased institutional capacity for coordinated management of Shire River Basin;
- Improved sustainable use of water resources in the Shire River Basin;
- Improved catchment management and protection;
- Improved consistency in water flows in the basin;
- Improved protection of human settlements and infrastructure, through a limited set of adaptation measures, including flood zone demarcation;
- Sustainable and productive agriculture from small scale irrigation and efficient use of water resources;
- Improved income generation at household level within the basin;
- Improved power generation at hydro power stations on the Shire River;
- Improved forest management in Eastern Escarpment, Tsamba and Mangochi Forest Reserve;
- Increased economic development within the Shire River Basin.
- Improved livelihoods through enhanced food security, nutrition and availability of disposable income;
- Decreased dependence on unsustainable exploitation of forest resources;
- Improved water availability for hydropower generation, irrigation activities and water supply;
- Improved weed management and reduced handlings costs; and
- Improved ecosystem management of the Elephant Marshes.

Key Generic Negative Impacts (in the absence of planned mitigation measures):

- Land acquisition on both banks of the Shire River and in areas where people need to relocate to make room for new construction works;
- Disruptions to aquatic life and the fishing patterns of local communities due to the construction of temporary coffer dams during to upgrading of the Kamuzu Barrage;
- Removal of vegetation from construction sites;
- Changes in water flows and levels during the upgrading of Kamuzu Barrage (addressed in a separate Environmental and Social Impact Assessment);
- Water pollution from uncontrolled agro-chemical and pesticides use;
- Blockage of river access and crossing points for animals (domestic and wild) and people where steep embankments are constructed or reinforced for flood protection; and
- Water logging and stagnation in irrigation schemes.

The ESMF also advances that for its implementation to be successful, involvement and participation of local communities is paramount. Specifically the ESMF recommends:

- Use of this Framework prior to any applicable project activity of the SRBMP;
- Environmental and social awareness education for key stakeholders and affected communities;
- Training project implementation personnel in the target districts to implement the ESMF and the screening process;
- Updating the ESMF when needed, to respond to changing local conditions and to adjustments in project implementation plans; and
- Building capacities of the city and town/district councils to support the environmental and social management process.

The ESMF recommends that the proposals made herein be implemented adequately to mitigate the consequential environmental impacts of the project activities. It is also recommended that the Environmental Affairs Department and other relevant line ministries should ensure that human activities that lead to deforestation and other environmental problems are properly managed and monitored.

Finally it is recommended that the following key sections of this ESMF should be included in the Project Implementation Manual: the Screening Process (Sections 3.1- 3.6); the Environmental Management and Monitoring Plan (Sections 5.1-5.3); and Capacity Building and Training Requirements (Sections 7.1 to 7.2). The Environmental Rules for Contractors (Annex 7) should also be a part of every bidding document and contract involving project-supported civil works.

CHAPTER ONE: PROJECT DESCRIPTION AND OBJECTIVES OF THE ESMF

1.1 Project Description and Location

The Government of Malawi (GoM) has received a Project Preparation Advance (PPA), on the proceeds of a credit from the International Development Agency (IDA) of the World Bank, to finance preparation of the Shire River Basin Management Project (SRBMP). The World Bank is assisting the GoM in the preparation of the SRBMP, as part of a longer term Shire River Basin Program.

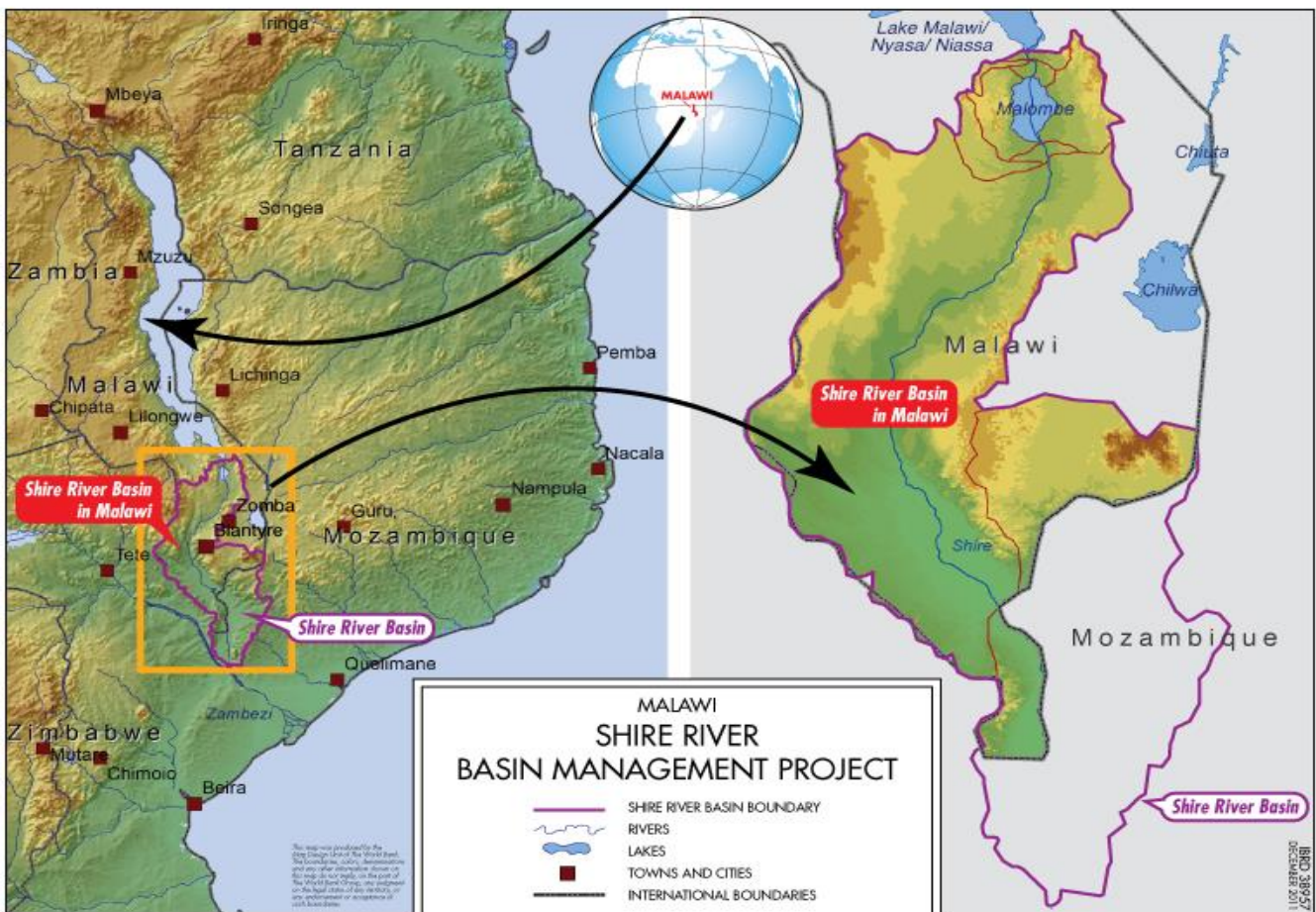
The main program development objective is to increase sustainable social, economic and environmental benefits by effectively and collaboratively planning, developing and managing resources within the Shire River Basin. Specific objectives of the project include to (1) strengthen the institutional capacities and mechanisms for Shire River Basin monitoring, planning, management and decision support systems; (2) invest in water related infrastructure that sustainably improves water resources management and development; (3) reduce erosion in priority catchments and sedimentation and flooding downstream, while enhancing environmental services, agricultural productivity and improving livelihoods; (4) improve flood management in the Lower Shire and provide community level adaptation and mitigation support; and (5) protect and enhance ecological services in the Basin.

The program investments will be designed to support the GoM's economic growth and sustainable development plans for the Shire River Basin. The Program will address the interlinked challenges of poverty and a deteriorating natural resource base in the Shire River Basin, to halt the process of environmental degradation and improve the productive potential of natural resources. The program will also promote integrated climate resilient investment planning in the basin, including institutional capacity building, to plan and monitor changes in land use patterns at a basin level.

Phase I of the project in the program will support strategic planning and implementation of large-scale infrastructure investments; adoption of sustainable land, forest and water management practices (to reduce land degradation in production landscapes and improve the productivity and incomes of smallholder farmers in priority catchments); and improved flood management in the Lower Shire. The first project is expected to involve an investment of about US\$145 million and will be implemented over five and a half years.

The Government of Malawi, through the Ministry of Water Development and Irrigation is implementing the SRBMP. Water, Waste and Environment Consultants (WVEC) has been engaged by the Ministry to prepare this Environmental and Social Management Framework (ESMF) for the SRBMP.

The Shire River Basin Management Project (SRBMP) is located in the Southern Region of Malawi and lies in the southern part of the Great East African Rift Valley. The Shire River Basin is between 9 and 20 degrees south; and between 18 and 36 degrees east (Map. 1.1).



Map 1.1: The Shire River Basin Management Project Area

1.2 Project Components and Activities

The Project will address the interlinked challenges of poverty and a deteriorating natural resource base in the Shire River Basin, to halt the process of environmental degradation and improve the productive potential of natural resources. The Project activities will support strategic planning and implementation of large-scale infrastructure investments; sustainable land, forest and water management practices; resilience to climate risk of smallholder farmers in priority catchments and flood management in the Lower Shire. Project investments will be designed to support the Government of Malawi's economic growth and development plans for the basin. The first phase of the Program will have duration of five and a half years and is organized in three components: (i) Shire River Basin Planning, (ii) Catchment Management, and (iii) Water Related Infrastructure.

Component A: Shire River Basin Planning (US\$M 40.2) will lay the foundation for more integrated investment planning and system operations for the Shire River Basin. It aims at developing appropriate knowledge and institutions for integrated and sustainable planning and management of Basin investments. The component will finance development of a modern integrated Basin knowledge base and analytical tools, as well as well-planned structured stakeholder consultation to facilitate investments for water storage, hydropower, irrigation, water supply, transport and disaster resilience. It will facilitate investment in systems operation planning of Kamuzu Barrage and flood forecasting. This component is critical for transformation from the current fragmented approach to investment and systems operation, to a more coordinated and holistic approach for development and management of the Basin. It will support institutional coordination mechanisms for basin

planning and management for the basin's socio-economic development and environmental sustainability. The component is organized in four sub-components as follows:

Sub-component A.1: Develop Shire River Basin Plan, with two activity sets:

- (i) Preparing an inter-sectoral Shire River Basin Plan, including a basin wide consultative development planning process supported by planning and operational decision support systems, acquiring datasets (satellite imagery etc.); and training for water resources planning and management (this will include (a) development of a DSS based on a further developed Malawi Water System Simulation Model, complemented with a rainfall-runoff module, a flood routing module, improved DEM and mapping data; and a water allocation and use administration system); (b) continuous refining of the Flood Risk Management Action Plan for the Basin (being prepared by Department of National Relief and Disaster Management (DNRDM) and MWDI with Bank support under the Global Facility for Disaster Reduction and Recovery); and (c) survey and mapping of natural habitats for the contribution of ecological infrastructure to river basin functions to be assessed and reflected in Basin planning); and
- (ii) Strengthening inter-sectoral Shire River Basin coordination and management institution(s), initially in the form of a Shire River Basin Authority under the Water Resources Board and perhaps later in the form of a Shire River Basin Agency or similar, with provisions for civil works (building), staffing, equipment, operational costs, communications, workshops, research and innovation. Critical for coordination will be the establishment of the Shire River Basin Stakeholder Forum, with representatives from key stakeholders as a critical platform for debate and basin vision development. The Forum will be linked to the basin management institution.

Sub-component A.2: Build institutional capacity for coordinated basin management

- (i) This sub-component will strengthen the different line agencies in Shire River Basin management to more effectively carry out their respective roles. The agencies include the Departments of Water Resources, Irrigation, Land Resources Conservation, Fisheries, Energy, Forestry, Climate Change and Meteorological Services, Environmental Affairs, National Relief and Disaster Management and National Parks and Wildlife. Also included are the Surveys and National Spatial Data Centre, Forest Research Institute of Malawi and National Botanical Gardens and Herbarium,

Sub-component A.3: Improve water resources information systems, with two sets of activities for:

- (i) Rolling out the framework water resources information system, as proposed under the NWDP, to monitor water flows and discharges, water quality and sediment loads, as well as groundwater, modern communications such as GSM telemetry in combination with traditional gauging stations, complete with operational control systems within the Basin and on critical points along the Lake and its upstream catchments; and
- (ii) Flood Forecasting and Early Warning Systems, including hosting, improving and utilizing hydrological and hydraulic flood zone modelling, as well as community level early warning systems; also to be used to refine and update a) the operational regime of the Kamuzu Barrage; and b) the Integrated Flood Risk Management Plan.

Sub-component A.4: Program management, monitoring and evaluation to ensure efficient and timely delivery of project resources in accordance with the project's objectives.

The multi-sector and multi-agency Technical Team formed and located in MWDI, led by a Project Coordinator who reports directly to the Permanent Secretary (PS) will be strengthened to facilitate its operations, and support its staff including an environmental and social safeguards specialist, an institutions specialist, GIS and modelling experts, economist and water resources planner, as well as a diverse range of short term expertise and annual external audits. Workshops, short training courses and formal training (in hydrology and land resources) are included in the support. Specific provisions for M&E include baseline and end-of-project surveys.

A Mid-Term Review of the project implementation arrangements project performance will be conducted.

Component B: Catchment Management (US\$M 45.0) has the objective to *rehabilitate degraded catchments for sustainable natural resource management and livelihoods through an integrated, participatory approach*; using community-based natural resource management systems. The community activities to be promoted may require longer time than the project duration. Hence the project will institutionalize a successful approach for early results to be expanded and consolidated through the next phase in the program. Three stages at the local micro-catchment level would involve:

- (i) Building conditions for micro-catchment rehabilitation and alternative livelihood development, including community sensitization, social mobilization and capacity building to ensure ownership and a strong foundation for subsequent interventions;
- (ii) Implementation of micro-catchment development plans and alternative rural livelihoods; and
- (iii) Continuing financial and technical support for catchment rehabilitation and livelihood activities while phasing out project activities.

Sub-component B.1: Build institutional capacity for sub-catchment planning and monitoring with five sets of activities:

- (iv) Strategic planning and facilitation will support the development of broad sub-catchment plans covering approximately 30,000 hectares each and including 10-12 Group Villages (in pre-identified catchments), and will include some strengthening of management coordination for the southern Shire protected areas cluster;
- (v) Participatory micro-catchment planning at the Group Village level to develop integrated plans covering approximately 3,000 hectares each;
- (vi) Development of (project & national) guidelines and detailed field manuals and training on their use;
- (vii) Monitoring and evaluation; and
- (viii) Implementation support to provide technical assistance to government and communities at the national and field level. The proposed monitoring model for catchment management planning and implementation would apply remote sensing and GIS along with field based data collection to track program inputs and outputs, institutional performance, impacts and outcomes. The M&E framework would capture parameters in a computerized MIS and be linked to the district and national M&E systems; to improve the program performance, ensure transparency, accountability and lesson learning in the program. Hence it will work at the individual program level as well as at the Basin Level; mapping different initiatives and creating a common methodology to improve planning and aid effectiveness.

Sub-component B.2: Rehabilitate targeted sub-catchments: will finance interventions identified in micro-catchment plans prepared under sub-component B.1, including:

- (i) Soil and water conservation for more sustainable and productive agriculture;
- (ii) Forestry and rural energy interventions to restore forest cover and reduce firewood consumption within the sub-catchments;
- (iii) Stream and water control, including check dams and small earth dams to support improved water management through small structures built by community members.

Sub-component B.3: Alternative rural livelihoods would support demand and market driven IGAs, with special targeting of women, youth and landless groups, to gradually decrease dependence on low performance agriculture and unsustainable harvesting of forest and wetland products. This includes:

- (i) Area-specific market demand and value chain transaction support studies; agricultural fairs aimed at identification of linkages with markets;
- (ii) Development and start-up of alternative livelihoods to support identification, mobilization, sensitization, and initial capacity building of common interest groups (CIG) for commercially oriented IGAs;
- (iii) Mini and small scale irrigation, fish and farm ponds on both hills and flatter arable lands to assist farmers in agricultural intensification, particularly related to agri-business development,
- (iv) District level infrastructure in each sub-catchment based on initial assessments, for instance rural roads, market infrastructure and community-level facilities for post-harvest storage;
- (v) Mentoring to build organizational, technical, financial and business capacities; and
- (vi) Access to rural finance to create a community fund where CIGs can apply for interest-bearing loans to support scaling up of small-scale enterprises after demonstrating successful business performance and solid business plans for growth.

Sub-component B.4: Sustainable management of the Shire forests would strengthen management of remaining natural habitat blocks in the middle and lower Shire to protect and enhance the delivery of environmental services (such as watershed protection, flood attenuation, biodiversity conservation, carbon storage and as a basis for generating revenues from tourism). This will include:

- (i) Investments to strengthen protected areas management and address people-park conflicts in and around Lengwe and Liwonde National Parks – including improved planning, development of sustainable financing mechanisms, development of essential infrastructure to boost revenues from tourism and improve conservation management, creation of water points, provision of training and essential equipment and cross-support to other protected areas in the middle and lower Shire;
- (ii) Establishment of community forest management in the Mangochi-Namizimu Forest Reserve adjacent to Liwonde National Park. These activities will complement the IDA-funded SLWM investments in predominantly agricultural lands under B2; and
- (iii) Improve relationships between local communities and Park authorities through small grant support to CBOs and natural resources associations around Liwonde and Lengwe National Parks.

Component C: Water Related Infrastructure (US\$M 59.0) has the objective of *developing the water resource by enhancing the infrastructure platform for multi-sectoral growth in the basin and to mitigate risks posed by droughts and floods*. The component will build on the basin planning carried out under Component A and the priorities as set out in the National Water Resources Investment Strategy prepared in 2011. The component is organized in three sub-components:

Sub-component C.1: Kamuzu Barrage will support the construction and construction supervision of the Kamuzu Barrage upgrade at Liwonde. The major intended functions of the upgraded Barrage are to regulate water flow in the Shire River, improve weed management and reduce handling cost, influence the water level in Lake Malawi; and improve safety and traffic circulation.

The component will improve the effects of the regulation as far as possible by slightly increasing the highest regulated water level at the Barrage (up to 40 cm, still within the natural range); and by operational measures based on improved hydrological observations, hydraulic modelling, decision support on water demand and ability to operate the Barrage in real time.

Sub-component C.2: Flood Management. The project aims at improving flood management in the Lower Shire, focusing specifically on the most flood prone Chikhwawa and Nsanje districts. Implementation of the activities under this component will be carried out in collaboration with other initiatives, to support implementation of the Integrated Flood Risk Management Plan (IFRMP) for the Lower Shire. The objective is to reduce the vulnerability of communities at risk through improved

community disaster preparedness, increased flood warning times, and improved government planning based on flood mapping and zoning. Key activities under this component include: construction of small-scale flood protection infrastructure; disaster risk awareness raising and planning; construction of community-based adaptation measures, such as flood demarcation, elevated platforms, shelters and safe havens, connectivity to and training on the Flood Forecasting and Early Warning Systems; communication and transport equipment for Civil Protection Committees and rescue teams; and pilot investments in ecological flood mitigation and climate resilient livelihoods in the Elephant Marshes

Sub-component C.3: New Water Investments within the Shire River basin will support feasibility and design studies for additional water related infrastructure works such as: agriculture in general and irrigation agriculture in particular, aquaculture, urban and rural water supply, hydropower, transport and disaster resilience. Special attention could be given to the design of a set of measures for flood mitigation in the Ruo River, the notoriously forceful flooding tributary to the Lower Shire, for possible financing in a second phase or a different initiative, based on the recommendations of the IFRMP.

1.3 Objectives of the ESMF and Relation to Other Safeguards Instruments

The overall objective of this ESMF is to provide an overview of the anticipated environmental and social impacts, and propose mitigation and enhancement measures for the identified impacts of the SRBMP. The ESMF presents the Screening Form (annex 4) for determination of the environmental and social management requirements of the proposed project activities to prevent, minimize, or mitigate adverse impacts, while enhancing the positive impacts of the SRBMP activities. The ESMF fits within a menu of safeguard instruments that address the full spectrum of environmental, social and legal safeguards issues. Critical among these was the Strategic Environmental and Social Assessment, as well other instruments described in sections 1.3.1 and 1.3.2.

1.3.1 Lessons from the Strategic Environmental and Social Assessment

A Strategic Environmental and Social Assessment (SESA) has been completed for the Shire River Basin. Its recommendations have been internalized in program design, amongst which is the centrality of Kamuzu Barrage upgrading to help ensure sustainable future development within the Shire River Basin. The SESA focused on identifying the most critical issues to be addressed for sustainable development in the Shire River Basin. A number of salient issues were identified, and the project is addressing many of them.

The lessons from the SESA that are reflected in project design include that: (a) issues relating to sustainable development in the Shire River Basin are wide ranging, complex, involve every sector of the economy, and can be grouped under three key headlines: land management, water management, and human resource management; (b) the framing and implementation of policies, plans and programs need to involve all relevant government ministries and district councils; (c) the private sector has a key role to play in sustainable development in the Shire River Basin, and there needs to be greater involvement of NGOs, civil society and the public in general in ensuring that strategic issues are kept in focus by government; (d) the dynamics of environmental change in the Shire River Basin need to be properly understood, monitored and responded to; and (e) effective water resource and regional land use /spatial planning need to be introduced.

The SESA indicated that many of the challenges in the Shire River Basin were due to insufficient attention to environmental dynamics, rapid population growth that undermines current achievements, uncoordinated development planning without adequate environmental and social safeguards, unplanned urbanization, need for critical review of policy, plan, and program performance, need for strengthening water and natural resources management institutions and governance, and need for awareness-building. Addressing this situation in a comprehensive manner

would require improved work on water, land, and natural resources management, as well as strengthening the associated human resources capacity. The SESA made recommendations to ensure that there is sustainable development within the Shire River Basin (many of which have been addressed in the project and program design). Some of the recommendations include:

1. Establishment of an autonomous institution for Shire River Basin Management; development of a land use plan for the basin, preparation and updating of biennial report on the status of the basin. This recommendation has been included in Component A of the SRBMP.
2. Establishment of an environmental monitoring body to review all relevant environmental data including climate, meteorological, land use and development activities. The monitoring body will also strengthen reporting on monitoring effects of environmental change particularly climate and disaster risks, with particular emphasis on Lake Malawi water levels and Shire river flows.
3. Development of a public awareness program on population management (but this is out of scope for the current SRBMP). However, improving programmes, plans and project to support transition of population migrating to urban areas would be partially addressed during the planning stage of the SRBMP.
4. A new coordinated approach to solving Malawi's energy crisis including focus on alternative energy; to be supported in the overall SRBM program, with immediate support in selected catchments under Component B. SRBMP will also strengthen knowledge base and capacity for appraising major programs through preparation EIAs/ESIAs to ensure objectivity and transparency.
5. Improved monitoring and reporting of results of major initiatives from all agencies (SRBMP Components A and B) with emphasis on investment in operating agencies in Shire River Basin, at national, district/NGO levels (part of the SRBMP). Designers of all programs and projects should give careful attention to improving staff commitment and initiative.

Critical Areas recommended for Investment (*Focus on "hotspots for action"*) include:

- Addressing energy shortfalls (upgrading Kamuzu barrage and optimizing its operations, alternative energy work in watersheds, and preparation of new investments)
- More reliable water resource development (Component A and Component C)
- Reduce current scale of deforestation in Neno and Mwanza districts (improved management of forest reserves, including two in Neno district - Component B with GEF financing)
- Unified approach to land and water management in Mwanza River catchment (part of Components A and B and additional support in next program phase)
- Coordinate approach to flood risk management in the lower Shire Valley in Chikhwawa and Nsanje (the focus of the flood management activities in Component C)
- Re-establishment of rail/road bridge and embankments in the Lower Shire and transportation in the East Bank of the Lower Shire (major transport activities out of scope of current project. Basin planning may help support consideration; community-level embankments in Lower Shire being supported under Component C and any larger structures can be considered for preparation of new investments)

1.3.2 Other safeguards instruments for the Project

In addition to the ESA, RPF, PF and SESA, the following safeguards related instruments have been developed for the SRBMP:

1. **An Independent Environmental and Social Impact Assessment (ESIA)**, including an Environmental and Social Management Plan (ESMP), and a Resettlement Action Plan (RAP) of the Kamuzu Barrage Upgrading which were disclosed on December 29, 2011,

2. **A preliminary Environmental Impact Assessment (EIA)** completed in 2003 as part of the Feasibility Study; The Integrated Water Resources Development Plan for Lake Malawi and Shire River System “Lake Malawi Level Control”—Stage 2, Final Feasibility Report, Volume II, Part C—EIA of Upgraded Liwonde Barrage, Norconsult).
3. **A Riparian Notification Letter** sent by the World Bank has sent on behalf of the Government of Malawi to the governments of all the other Zambezi River Basin countries (Mozambique, Tanzania, Angola, Botswana, Namibia, Zambia, and Zimbabwe), since the Shire River Basin forms part of the larger Zambezi Basin.

1.4 Justification for the ESMF

The rationale for preparing this ESMF is that the precise type and location of proposed project activities are not known at this time. Therefore the potential environmental and social impacts of the project activities cannot be identified in the context of a traditional EIA.

For development project activities whose design details and locations are known, the Malawi Environment Management Act (1996) and the Malawi EIA Guidelines (1997) prescribe the conduct for Environmental Impact Assessment. However, these instruments do not have guidelines for the screening process for the identification, assessment and mitigation of potential localized impacts, where the project details and specific project sites are not yet known.

The ESMF provides mechanisms for ensuring that potential environmental and social impacts of the SRBMP are identified, assessed and mitigated as appropriate, through an environmental and social screening process. The ESMF therefore complements the Malawi EIA procedures for meeting the environmental and social management requirements, as outlined in Appendix C of the EIA Guidelines. The ESMF also complies with the World Bank Operational Policies for environmental management of projects where specific details are not yet known.

1.5 Potential Users of the ESMF

The ESMF has been prepared as a reference manual for use by key stakeholders to be involved in the planning, implementation, management and operation of the proposed SRBMP. As a reference material, the ESMF may be useful to the following SRBMP key stakeholders: funding and donors agencies; the Ministry of Water Development and Irrigation; Ministry of Environment and Climate Change; Ministry of Lands and Housing; Department of National Relief and Disaster Management; Electricity Supply Corporation of Malawi (ESCOM); Water Boards (Blantyre and Southern Region Water Boards); Town & Country Planning Committees and District Executive Committees in the impacted districts; irrigation institutions (Illovo Sugar Corporation, Demeter Farm, Kasinthula and Nkhate Schemes and other smallholder irrigation farmers); Non-Governmental Organizations and Community Based Organizations; the Water Transport Sector including the Nsanje World Inland Port; Politicians and Local Traditional Leaders and; Senior Government officials responsible for policy making and development planning.

1.6 Approach and Methodology to the preparation of the ESMF

One of the key objectives of the ESMF is to provide a screening process for potential environmental and social impacts for the planned future project activities of the SRBMP, and to recommend a generic management plan for addressing the potential negative impacts. In development of the ESMF, consultations with key stakeholders were employed through a reconnaissance survey, conducted from 18 to 21 November 2011; and detailed field investigations were carried out from 12 to 16 February 2012. The rationale of these extensive consultations was to solicit views of a cross section of people, at the local, district, and central government level. The organizations and interest

groups which participated, and the main issues discussed during the consultations have been included in the Annex 8.

The strategies of executing this assignment followed the following six steps:

- (a) Review of existing general biophysical and social conditions of the proposed project areas;
- (b) Review of typical implementation approach and processes for the proposed project activities;
- (c) Identification and analysis of potential environmental and social impacts the project activities are likely to trigger and generate within and around the project areas;
- (d) Development of the appropriate screening process for the proposed project sites and project activities.
- (e) Identification of appropriate generic mitigation measures for the likely potential negative environmental and social impacts and;
- (f) Compilation of a generic management and monitoring plan for addressing the impacts during planning and design, implementation, operation and maintenance of the project activities.

Information for preparation of the ESMF has been collected through a number of research methods, which include review of related literature from published and unpublished documents, field investigations and consultation with key stakeholders. The field investigations and public consultations were conducted in Ntcheu, Mangochi, Machinga, Balaka, Zomba, Blantyre, Mwanza, Neno, Thyolo, Chikhwawa and Nsanje. Key stakeholders consulted included central government officers in Lilongwe, officials from the Water Boards, City, Town and District Councils as well as persons who would be affected either positively or negatively by the project. The list of stakeholders conducted during this preparation of this ESMF is provided in Annex 8.

1.7 Organization of the ESMF

The report is organised as follows:

Chapter One: provides the background information to the SRBMP; and introduces the various levels at which the project will be implemented. The chapter gives an overview of the proposed project components and activities in the Shire River Basin. It narrates the purpose, scope, justification, and potential users of the ESMF. Finally the chapter gives the approach and methodology used in preparing the ESMF.

Chapter Two provides relevant Malawi Environmental policies and legislation for the SRBMP. The chapter also describes the relevant World Bank Operating Safeguard Policies; and finally compares the two to highlight any gaps that exist; making recommendations for addressing the gaps.

Chapter Three presents the screening process for sites and significant environmental and social impacts of the SRBMP. The screening process is presented in four distinct steps of (i) desk appraisal of the project activities and field assessments; (ii) assigning of appropriate environmental categories; (iii) carrying out the environmental work; and (iv) review and approval of the screening results and recommendations. The chapter introduces procedures and checklists for screening future project activities. It also gives a description of the public consultation and disclosure process.

Chapter Four describes the generic potential environmental and social impacts of the proposed Project activities during all the project phases. These impacts include those that are perceived by the various key stakeholders consulted. The sources of the impacts are described in relation to the environmental components, which they are likely to impact. The sources include civil works for construction and various human activities that create strains on natural resources and social services. The impacts are the basis for development of the EMP and monitoring plans in Chapter 5.

Chapter Five gives the Environmental and Social Management Plan (ESMP), which outlines the identified environmental and social impacts, the proposed mitigation measures, responsible institutions for implementing the ESMP, dates and estimated costs. This chapter also describes the Monitoring Plan which lists the proposed institutions to carry out monitoring activities, monitoring indicators, monitoring frequency and the costs for carrying out the monitoring activities.

Chapter Six summarizes implementation arrangements for the ESMF, by way of assigning tasks to various stakeholders. The chapter details the activities to be carried out by the Project executing agencies, civil works contractors, Area Executive Committee; the administrative staff at the city, town, district and community levels and the various committees at the national level.

Chapter Seven proposes the capacity building and training requirements for the implementation of the ESMF. The proposed areas of training include: Environmental and Social Impact Assessment, Environmental Policies, the Screening Process, Identification of Impacts and Preparation of Reports. The chapter also provides recommendations for training and awareness creation of social impacts including those of HIV and AIDS and other sexually transmitted diseases.

Chapter Eight gives the recommendations of the ESMF, among them being that effective implementation of the SRBMP environmental and social management framework has to be looked at in the context of other existing environmental problems and those problems that may arise from other future project activities not related to SRBMP. The chapter also recommends that successful implementation of the ESMF will depend, to a large extent, on the involvement of the local communities. Finally the chapter gives specific recommendations, some of which are creation of awareness, use of the local community structures to implement the ESMF and the need to assist and support the project impact city, town and district councils with adequate resources and equipment necessary for implementing the ESMF.

CHAPTER TWO: RELEVANT LEGISLATION AND THE WORLD BANK POLICIES

2.1 Malawi Legislation Relevant to SRBMP Implementation

Legislation, policies and instruments exist to support environmental management of the Shire River Basin. These include general and sector specific policies, which are presented as follows:

2.1.1 The Constitution of the Republic of Malawi (1995)

The Constitution of the Republic of Malawi provides the foundation for environmental management in Malawi. Sections 13 (d) and (e) define the role of the State in environmental management as follows, which is to manage the environment responsibly in order to: prevent degradation of the environment; provide a healthy living and working environment for the people of Malawi; accord full recognition to the rights of future generations by means of environmental protection and sustainable development of natural resources; and conserve and enhance the biodiversity of Malawi. In addition, the role of the State is to enhance the quality of life in rural communities and to recognize rural standards of living as a key indicator in the success of Government policies.

With respect to gender, the Constitution, under Section 13 (e), gives the State the responsibility to achieve gender equality for women through: full participation of women in all spheres of the Malawian society, on the basis of equality with men; implementation of principles of non-discrimination and such other measures as may be required; and implementation of policies to address social issues such as domestic violence, security of the person, lack of maternity benefits, economic exploitation and rights to property.

The implication of these provisions is that all the project activities of the SRBMP should be implemented in an environmentally sustainable manner, through environmental safeguards which are covered in this ESMF.

2.1.2 The National Environmental Action Plan (2002)

The National Environmental Action Plan (NEAP), developed in 1994 and updated in 2002, provides a framework for integrating the environment into all socio-economic development activities of the country. The objectives of the NEAP are to: document and analyse all major environmental issues and measures to alleviate them; promote sustainable use of natural resources in Malawi; and develop an environmental protection and management plan. The NEAP identifies the following as key environmental issues to be addressed: soil erosion, deforestation, water resources degradation and depletion, threat to fish resources, threat to biodiversity, human habitat degradation, high population growth, air pollution and climatic change. In order to protect the environment from further degradation; the NEAP outlines actions that need to be undertaken to ensure adequate environmental protection. The actions relevant to the SRBMP include to:

1. Discourage cultivation on marginal lands (steep slopes and river banks)
2. Promote agro-forestry;
3. Construct permanent physical conservation structures such as storm water drains, check dams and flood intervention structures;
4. Improve land productivity through sustainable land saving technologies;
5. Intensify training of farmers in improved farming practices;
6. Improve management of forest resources on customary land; and
7. Promote proper handling and use of agrochemicals.

The SRBMP has elements of these actions as strategies to increase the agricultural productivity of communities within the priority catchments under Component B. Most of the issues identified in the

NEAP are linked to catchment management and therefore any efforts to address the issues as prioritised by the SRBMP will involve and benefit the communities within the prioritised catchments.

Through the SRBMP, catchment management and rehabilitation of degraded lands will be implemented, to protect the natural resources base. In addition, improved regulation of flow in the Shire River will complement the environmental protection and management measures needed to achieve sustainable development, as required by the NEAP.

2.1.3 National Environmental Policy (2004)

The National Environmental Policy (NEP) was developed in 1996 and revised in 2004. The policy at promotes sustainable social and economic development, through sound management of the environment and natural resources. It highlights areas of priority, including efficient utilization and management of natural resources; and promotes private sector, NGO and community participation to achieve sustainable environmental management and to involve local communities in environmental planning. The policy empowers communities to protect, conserve and sustainably utilize the nation's natural resources and advocates for enhancement of public awareness and promotion of public participation. It also prescribes cooperation with other Governments and relevant international and regional organizations in the management and protection of the environment.

Objectives of the NEP address a broad range of environmental problems facing Malawi. In line with the requirements of the NEP, the SRBMP is integrating environmental management and protection during project planning and implementation. The NEP provides the basis for the participation of the local communities in the management of natural resources and the environment for the SRBMP.

2.1.4 Environment Management Act (1996)

The Environment Management Act provides the legal basis for the protection and management of the environment and the conservation and sustainable utilization of the natural resources. The Act, under Section 24, specifies the types and sizes of activities that require an Environmental Impact Assessment (EIA) before they can be implemented in Malawi. A prescribed list of projects to which (EIA) applies is provided in the Guidelines for EIA, 1997. The Act further outlines the EIA process to be followed in Malawi; and requires that all project developers in both the public and private sectors comply with the process. The Act, under section 26 (3), further requires that no licensing authority issues any license for a project for which an EIA is required, unless the Director of Environmental Affairs (DEA) has given consent to proceed; on the basis of a satisfactory EIA or non-requirement of an EIA. Non-compliance with the EIA requirements is an offence and attracts penalties.

Some of the activities of the SRBMP may fall under the list of prescribed projects as determined by the EIA Guidelines. EIA studies will be conducted for these activities before implementation. However, since the project locations and the extent of project activities are not exactly known at this time, the ESMF is required for the environmental and social screening, to guide the developer in determining the level of environmental work required for each sub-project.

2.1.5 EIA Guidelines (1997)

The EIA Guidelines of 1997 outline the process for conducting EIAs to ensure compliance with the EIA process, as required in the Environment Management Act. The Guidelines contain a list of prescribed projects for which EIA is mandatory and those that may not require an EIA. The Guidelines assist in environmental screening to determine which projects require and EIA. To confirm whether an EIA is required or not, a developer may prepare a Project Brief and submit it to the EAD for review by the Technical Committee on the environment.

For the SRBMP activities, screened to identify project activities to be subjected to EIAs will be done using the Environmental and Social Screening form (Annex 4). EIAs will be conducted, as appropriate, for the project activities that qualify, by following the process outlined in the Guidelines.

2.1.6 Decentralization Policy (1998)

The Policy devolves administrative and political authority to the district level, in order to promote popular participation. It assigns certain responsibilities, one of which is to assist the government in the management and preservation of the environment and natural resources, to district councils. This policy is useful for the implementation of the SRBMP, as it supports the creation of sector committees at all levels of the district, to ensure participation of local, institutional and community stakeholders.

2.1.7 The National Forest Policy (1996)

The objective of the National Forest Policy is to sustain the contribution of the forest resources to the quality of life in the country, by conserving the resources for the benefit of the nation. This policy promotes sustainable contribution of national forests, woodlands and trees towards improvement of the quality of life in Malawi; by conserving the resources for the benefit of the nation and to the satisfaction of diverse and changing needs of the Malawi population, particularly rural smallholders. The Policy prohibits changes in land-use, which promote deforestation, constrain farm forestry or endanger the protection of forests with cultural or biodiversity or water catchment conservation values. It discourages excisions in gazetted forest, except in cases of environment friendly public utility, for which suitable inter-sectoral and local consultations will be established. Part IV of the Policy highlights the need for preparing management plans and participatory management of forest reserves. In this regard the Director of Forestry may enter into agreements with local communities for implementation of management plans that are mutually acceptable to both parties.

The SRBMP will support protection of catchments, which include water resources and forests such as Tsamba and Mangochi-Namizimu Forest Reserves.

2.1.8 National Parks and Wildlife Policy (2000)

The National Parks and Wildlife Policy facilitates sustainable conservation and management of wildlife resources, to provide for equitable access and utilization of the resources; and the sharing of benefits arising from use of the resources for both present and future generations. One of the policy objectives is to ensure adequate protection of ecosystems and their biological diversity, through promotion and adoption of appropriate land management practices that adhere to the principle of sustainable development.

One of the primary aims of the SRBMP is to ensure that the development and use of forest and water resources within Lengwe and Liwonde National Parks meets the needs of the present generation and considers the needs of future generations for all the beneficiaries and stakeholders.

2.1.9 National Land Policy (2002)

This is the principal policy that guides land management and administration in Malawi. It introduces major reforms intended for land planning, use, management and tenure and provides clear definition of land ownership categories (Section 4); addressing issues of compensation payment for land (Section 4.6). The policy has provisions for environmental management, urban management of solid and liquid wastes, protection of sensitive areas, agricultural resource conservation and land use, community forests and woodland management. Of significant importance are in Section 9.8.1(b) of the policy, which make EIA studies mandatory before any major land development project is carried out. Section 9.8.1(c) requires that development activities in vulnerable ecosystems such as wetlands, wildlife reserves, forest reserves and critical habitats will only be permitted after the appropriate authority has conducted an EIA study.

The SRBMP has to adhere to the requirements of this policy to achieve sustainable management and protection of land, water and other natural resources.

2.1.10 National Water Policy (2005)

The National Water Policy gives powers to the Minister responsible for water affairs in the country to enforce water resources regulations for the sustainable management and use of water resources including the laying out of mechanisms to ensure water is of acceptable quality and is accessible to all Malawians at all times. The policy also advocates for Integrated Water Resources Management in the country and therefore recognises the important role other policies play in resource management including water. It recommends that a National Water Resources Authority (NWRA), be established as the overseer of activities within each basin in the country, to give guidance on the use and management of resources therein, including water. Other institutions including the water boards, government ministries and in particular, ministries responsible for local government, agriculture, irrigation, natural resources, health, gender, the youth and community services, education, lands, physical planning and human settlements and others such as NGOs, Civil Society Organisations, the private sector, academic institutions shall closely liaise and collaborate with the National Water Resources Authority, in pursuance of strengthening Integrated Water Resources Management within each catchment, including the Shire River Basin. Implementation of the various activities within the SRBMP therefore must take into consideration, the principles of integrated water resources management, particularly with regard to consultation and involvement of all the players.

The relevance of this policy to the SRBMP is where the proposed Project activities might affect aquatic ecosystems either positively or negatively. If not properly managed, the activities of the SRBMP may lead to the degradation and depletion of water resources, thereby counteracting the principles of the National Water Policy. Therefore it will be vital for the Ministry of Water Development and Irrigation, as a key stakeholder, to ensure that the project activities are adequately monitored to protect natural water

2.1.11 Water Resources Act (1969)

The Act deals with the control, conservation, apportionment and use of water resources of Malawi. Of relevance to the project is Section 16 of the Act which states that it is an offence for any person to interfere with, alter the flow of, or pollute, or foul any public water. This Act requires that the programmes, projects and activities under the SRBMP avoid water degradation and depletion when developing new water-related infrastructure and rehabilitating or upgrading the existing ones.

2.1.12 Forest Act (1997)

The Forestry Act provides for participatory forestry, forest management, forestry research, forestry education, forest industries; and protection and rehabilitation of environmentally fragile areas. The Act, among other things, seeks to: augment, protect and manage trees and forests on customary land, in order to meet basic fuel wood and forest produce needs of local communities and for the conservation of soil and water; promote community involvement in the conservation of trees and forests in forest reserves and protected forest areas; prevent resources degradation to increase socio-economic benefits; promote community involvement in conservation of trees and forests; promote optimal land use practices through agro-forestry in small holders farming systems; protect fragile areas such as steep slopes, river banks, water catchment and conserve and enhance biodiversity. The SRBMP has to comply with this Act in all areas where the planned Project activities will be implemented.

2.1.13 Fisheries Conservation and Management Act (1997)

The Fisheries Conservation and Management Act (FCMA) 1997, identifies issues which have a bearing on the SRBMP such as restoration and improvement of spawning grounds impacted by siltation and changing water flow regimes; retention of the unique biodiversity of Shire River and

protection from pollution sources. The SRBMP will take these issues into account, through the various safeguard instruments prepared, to ensure that it does not adversely affect fish resources. This is critical especially with respect to the project activities in upper and lower Shire River Basin.

2.1.14 Town and Country Planning Act (1988)

The Town and Country Planning Act is a very important policy for managing land use in Malawi. The Act advocates regulation of developments, with respect to location, to ensure compatibility of land use over a project area. The Act promotes protection and sustainable utilization of natural resources through optimal use of land and related service infrastructure. The Town and Country Planning Act will provide guidance to help ensure that the SRBMP optimally utilizes and manages land resources and that the proposed development activities are compatible with the land use planning.

2.1.15 Pesticides Act, 2000

The Pesticides Act for Malawi was accepted by Parliament in 2000. This Act enables Malawi to have control on the import, export, manufacture, distribution, storage, disposal and use of pesticides. The establishment of the Pesticide Control Board was accomplished and the office of the registrar is now in place. The Pesticides Regulations were gazetted on 22 February, 2002, and this resulted in the enforcement of the law on 1 May, 2002.

The enforcement of the law gives the following outputs / results:

- Registration of all marketed pesticides in Malawi;
- Registration of all pesticides according to the crops and the target pests and diseases;
- Documentation of all import permits and licenses for selling and storage of pesticides;
- Conducting stakeholders' workshops to create awareness to the general public on the Pesticides Act;
- Encouragement on safe usage of pesticides;
- Carrying out formulation control in collaboration with the Malawi Bureau of Standards;
- Harmonization of pesticides registration through international bodies such as SEARCH;
- Labelling of pesticides containers according international standards; and
- Carrying out proper disposal of obsolete stock.

2.2 Relevant World Bank Safeguard Policies Compared with the National Legislation

The proposed Shire River Basin Management Project has triggered eight of the 10 World Bank's operational safeguard policies as follows:

2.2.1 Environmental Assessment (OP/BP 4.01)

OP 4.01 has the objective to ensure that World Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and mitigation of their likely environmental and social impacts. This policy is triggered if a project has potential adverse environmental impacts and risks in its area of influence. The World Bank's classification of projects, with respect to significance of environmental and social impacts is as follows:

(a) Category A projects are likely to have significant adverse environmental and social impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities of the physical works. EA for a Category A project examines the project's potential negative and positive environmental and social impacts, compares them with feasible alternatives (including the "without project" situation), and recommends measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental and social performance. For a

Category A project, the borrower is responsible for preparing a safeguards document, normally either a Framework (Environmental and Social Management Framework –ESMF whenever there is still an unclear definition of the project intervention footprint); or an ESIA (or a suitably comprehensive sectoral EA) that includes as necessary, other elements such as environmental audits or hazard or risk assessments or when such a footprint of project intervention zone is made known.

(b) Category B projects have potential adverse environmental and social impacts (on human populations or environmentally important areas - including wetlands, forests, grasslands, and other natural habitats) which are less adverse than those of Category A projects. These impacts are site-specific and easy to deal with; few if any of them are irreversible; and in most cases appropriate mitigatory measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category “A” EA. Like Category A EA, it examines the project's potential negative and positive environmental and social impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental and social performance.

(c) Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental and social impacts. Beyond screening, no further EA action is required for a Category C project.

(d) Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that might result in adverse environmental impacts.

The construction and rehabilitation of infrastructure under the SRBMP are likely to have environmental and social impacts which require mitigation. Therefore, in line with the Operational Policy, the ESMF has been prepared for screening of the SRBMP project activities. The overall SRBMP is classified as Category A, mainly because of the Kamuzu Barrage upgrading (Component C.1) in Liwonde. The remaining activities to be carried out under the SRBMP are consistent with a Category B classification. Other than the Kamuzu Barrage, the SRBMP is not expected to fund any investments that have been classified as Category A based on the screening results.

2.2.2 Involuntary Resettlement (OP/BP 4.12)

OP 4.12 applies to all land acquisition and any changes in access to resources due to a sub-project. The policy applies whether or not affected persons must move to another location. The objective of OP 4.12 is to avoid or minimize involuntary resettlement where feasible by exploring all viable alternative project designs. Where resettlement is unavoidable, OP 4.12 is intended to assist displaced persons in maintaining or improving their living standards. It encourages community participation in planning and implementing resettlement and in providing assistance to affected people.

This policy is triggered not only if physical relocation occurs, but also by any taking of land resulting in: (i) relocation or loss of shelter; (ii) loss of assets or access to assets; and (iii) loss of income sources or means of livelihood, whether or not the affected people must move to another location. The Bank's policy requires a full Resettlement Action Plan (RAP) if over 200 people must be relocated or if these people are not physically displaced but lose over 10% of their assets due to the project. If the impact is less than this an Abbreviated Resettlement Action Plan should be prepared instead.

The nature and scale of sub-projects proposed under SRBMP may require only minimal displacement. Nevertheless, the ESMF provides criteria for determining the need for resettlement in the Environmental and Social Screening Form (ESSF, see Annex 4). Additionally, a Resettlement Policy Framework, with a Process Framework (RPF+ PF) has been prepared for SRBMP and complements this ESMF to guide any resettlement and related assistance that might be needed.

2.2.3 Natural Habitats (OP/BP 4.04)

This policy recognizes that conservation of natural habitats to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development is essential. It supports the protection, management and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. It also supports, and expects, a precautionary approach to be applied to natural resources management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. They comprise many types of terrestrial, freshwater, coastal, and marine ecosystems and they include areas lightly modified by human activities, but retaining their ecological functions and most native species. This policy is triggered by any project (including any sub-project under a sector investment or financial intermediary) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).

Although some of the proposed project activities of the SRBMP may affect natural habitats, the overall objective of the SRBMP is to improve sustainable utilization of natural resources management and promote sustainable development in the basin.

2.2.4 OP/BP 4.36 Forests

This policy focuses on the management, conservation, and sustainable development of forest ecosystems and their associated resources. It applies to projects that may (i) have impacts on the health and quality of forests; (ii) affect the rights and welfare of people and their level of dependence upon or interaction with forests; or (iii) bring about changes in the management, protection, or utilization of natural forests or plantations, whether they are publicly, privately or communally owned. The Bank does not support the significant conversion or degradation of critical forest areas or related critical natural habitats.

This policy is triggered by activities and other Bank sponsored interventions, which have the potential to impact significantly upon forested areas. The SRBMP seeks to improve forest conservation and management within selected upper catchment areas.

2.2.5 OP/BP 4.37 Safety of Dams

This policy focuses on new and existing dams. In the case of new dams, the policy aims at ensuring that (i) experienced and competent professionals design and supervise construction and (ii) the responsible agency adopts and implements dam safety measures for the dam and associated works. In the case of existing dams, the policy ensures that any dam upon which the performance of the project relies is identified, a dam safety assessment is carried out, and necessary additional dam safety measures and remedial work are implemented. The policy also recommends the preparation of a generic dam safety analysis for small dams.

This policy is triggered if the project involves the construction of a large dam (15m or higher) or a high hazard dam; if a project is dependent on an existing dam, or a dam under construction. For small dams, generic dam safety measures designed by qualified engineers are usually adequate. Under SRBMP for Component C, the planning of new dams or rehabilitation of existing dams will need to take into account this policy. Also, the Kamuzu Barrage upgrading will follow this policy, given the barrage's strategic economic importance (even though with a height of approximately 4 meters which is much less than the 15m high threshold).

2.2.6 OP/BP 7.50: Projects on International Waterways

Projects on international waterways may affect the relations between the World Bank and its borrowers, and between riparian states. Therefore, the Bank attaches great importance to the

riparian countries' making appropriate agreements or arrangements for the entire waterway or parts thereof, and stands ready to assist in this regard.

In the absence of such agreements or arrangements, the Bank normally urges the beneficiary state to offer to negotiate in good faith with the other riparian states to reach appropriate agreements or arrangements. The Policy lays down detailed procedures for the notification requirement, including the role of the Bank in effecting the notification, the period of reply and the procedures in case there is an objection by one of the riparian countries to the project.

The SRBMP has triggered this policy because (i) the Shire River is a shared water body with Mozambique; the Shire River is a tributary of the Zambezi River; and (iii) Lake Malawi (headwaters of the Shire River) is shared with Mozambique and Tanzania. Malawi, Tanzania, Mozambique, Namibia, Angola, Zimbabwe, Botswana and Zambia are co-riparian countries of the Zambezi River of which the Shire is a tributary.

2.2.7 OP 4.09: Pest Management

This policy promotes the use of integrated pest management (IPM) techniques that seek to minimize synthetic pesticide use, as well as the safe use, handling, storage, and disposal of pesticides in general.

This policy applies to the SRBMP since certain catchment management and alternative livelihood promotion activities might promote small-scale irrigation or other production systems where pesticides are used. In such special cases, the relevant sub-project investments will include technical assistance to farmers to promote IPM, as well as safer pesticide use where needed. However, the Project will not procure any pesticides; it also does not involve complex pest management issues that would require a separate Pest Management Plan.

2.2.8 OP/BP 4.11: Physical Cultural Resources:

OP/BP 4.11 addresses physical cultural resources (objects, sites, structures, groups of structures, and natural features and landscapes) that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. They may be located in urban or rural settings, and may be above or below ground. The procedures to address impacts on physical cultural resources in projects proposed for Bank financing should follow the environmental assessment (EA) process (see OP 4.01 and EIA regulation).

The following projects are subject to the provisions of this policy: (a) any project involving significant excavations, demolition, movement of earth, flooding, or other environmental changes; and (b) any project located in, or in the vicinity of, a physical cultural resources site recognized by the borrower. This policy is triggered in that project investments may occur in areas that contain archaeological relics, fossils, or other physical cultural resources. As an integral part of the EA process, the borrower develops a physical cultural resources management plan that includes measures for avoiding or mitigating any adverse impacts on physical cultural resources, provisions for managing chance finds, any necessary measures for strengthening institutional capacity, and a monitoring system to track the progress of these activities.

Some of SRBMP target areas are located in or near natural features and landscapes (e.g. archaeological sites), but on a small-scale. In the event that any such items are uncovered during construction of the Kamuzu Barrage or in other project-supported civil works, contractors and construction workers would be required to follow chance finds procedures, as specified in the ESIA for the Kamuzu Barrage and the ESMF for the overall project.

2.3 Gaps between World Bank Policies and the National Legislation

2.3.1 Environmental Assessment

Both the Malawi legislation on EIA and the World Bank OP 4.01 - Environmental Assessment - have provisions for conducting environmental impact assessment studies for projects that are likely to cause adverse environmental impacts. For the case of Malawi legislation, there is no provision for environmental and social screening of projects whose activities and locations are not known, while the Bank policy provides for environmental and social screening of each proposed project (and its subprojects) to determine the extent and type of environmental (and social) assessment. The Bank further classifies proposed projects into one of four categories, depending on the type, location, sensitivity, and scale of the project, and the nature and magnitude of its potential environmental and social impacts. By preparing the ESMF, the gap that exists for the projects whose activities and locations are not known is bridged.

2.3.2 Involuntary Resettlement

While the World Bank policy on involuntary resettlement requires the preparation of a Resettlement Policy Framework for projects that lead to land-taking or loss of access to valuable socioeconomic assets that may result in the physical relocation of people, the Malawi National Land Policy is not very clear on the procedures to be followed for cases requiring resettlement and compensation. As a result, resettlement and compensation have to be determined for each project affected person, (PAP). The preparation of the Resettlement Policy Framework (RPF) along with a Process Framework (PF) that addresses issues of restriction of access to legally designated national parks and protected areas bridges the gap and ensures that the project-affected persons are adequately catered for and that their livelihoods are restored or improved in comparison with their original conditions.

CHAPTER THREE: THE SCREENING PROCESS FOR PROJECT SITES AND ACTIVITIES

3.1 Introduction to the Screening Process

The key to environmental management for the SRBMP is to determine the appropriate studies and follow-up measures that might be needed. The screening process presented here follows OP 4.01 of the World Bank and the Malawi Guidelines for Environmental Impact Assessment. Screening will be carried out at the specific project sites, once they have been identified during implementation of the SRBMP. The screening process is necessary for the review and approval of the plans for the development of new catchment protection measures, priority investment projects and income generating activities in the SRBMP. The Kamuzu Barrage upgrading (Component C.1) will not be part of this screening process because it has its own, separate ESIA (including an ESMP) and a RAP. The objectives of the screening process for SRBMP sub-projects include to:

- Determine which construction and rehabilitation activities have potential negative environmental and social impacts;
- Determine the level of environmental analysis and follow-up environmental management work required;
- Determine appropriate mitigation measures for addressing adverse impacts;
- Incorporate mitigation measures into sub-project construction and operation of the development plans;
- Indicate the need for a Resettlement Action Plan (RAP), which would be prepared in line with the Resettlement Policy Framework (RPF) prepared for the SRBMP;
- Facilitate the review and approval of the construction and rehabilitation proposals and;
- Provide guidance for environmental 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 work that might be required, prior to the commencement of construction and rehabilitation of the SRBMP facilities, will depend on the outcome of the screening process described below (3.2-3.5).

3.2 Screening of Project Activities and Sites

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 SRBMP-supported sub-project. The Environmental and Social Screening Form (ESSF, Annex 4) will be completed by trained and qualified personnel, in the implementation of the screening process. 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 mitigation measures and;
- Need to conduct an ESIA and or prepare Resettlement Action Plans (RAPs) where required.

Since the administrative structures for the City/Town and District Councils are different, two screening flow-charts are proposed as follows:

3.2.1 Screening of Project Activities and Sites within the District Councils

For the District Administrative structure, the screening process will be conducted in the following manner (see Chart 3.1):

Preparation activities for the screening process will include a desk appraisal of the construction and rehabilitation plans for project related infrastructure. This will be carried out by the District Environmental Sub-committee (DESC) and Area Executive Committee (AEC). DESC is the environmental sub-committee of the District Executive Committee (DEC) and AEC is the village level administrative sub-committee of DEC. The DEC reports to the District Council.

Subsequent to the 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 (Annex 4), by the AEC and DESC, which includes the District Environmental Officer.

3.2.2 Screening of Project Activities and sites within City or Town Councils

At the City or Town Council, the process will be done in a similar manner to that of Section 3.2.1, except that the DESC for the entire district, with the assistance of the EDO will do the screening, while the Town and Country Planning Committee (TCPC) will perform the roles of the DEC. Chart 3.2 outlines the details of the screening process for the City and Town Councils.

3.3 Assigning the Appropriate Environmental and Social Categories

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 TCPC (for Town or City Council); or the DEC (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. However none of the SRBM sub-projects are expected to be in this category except the Kamuzu Barrage upgrading, assessed separately. Category B projects are those with one or a few potentially significant adverse impacts, which would require an Environmental 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 EIA or a specific EMP, but they would require adherence to good environmental practices, including any applicable Environmental Rules for Contractors (Annex 7).

Assignment of the appropriate environmental category will be based on the provisions of the World Bank Operational Policy (OP 4.01) on Environmental Assessment and the Malawi EIA Guidelines. Aside from the Kamuzu Barrage upgrading (which has been classified as Category A), all other SRBMP-supported sub-projects proposed would be categorized as either B or C.

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 TCPC or DEC will recommend approval of the screening results to the City/Town or District Councils respectively, 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.

The TCPC or DEC will have to pay particular attention to proposals for construction of new facilities such as irrigation infrastructure, check dams, flood diversion structures, access roads, water storage

tanks, new pipelines and related infrastructure; new sanitation facilities and new borrow pits as sources of construction materials.

In the event that Resettlement Action Plans (RAPs) will have to be prepared for SRBMP activities, these would be reviewed and approved by the Commissioner for Lands, consistent with the Resettlement Policy Framework; prior to commencement of project activities.

3.4 Carrying out Environmental and Social Work

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

- (a) The application of simple mitigation measures outlined in the ESSF (Annex 4) and Environmental and Social Rules for Contractors (Annex 7) will suffice (Category C);
- (b) 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 (Category A); using the Malawi EIA Guidelines whose process is given in Annex 6.

Although this screening process includes potential Category A sub-projects, none are expected under the SRBMP (other than the Kamuzu Barrage upgrading, which is being assessed separately).

3.4.1 Environmental and Social Screening Form

The ESSF in Annex 4 will be completed by qualified members of the DESC. Many of the activities categorized as B (which may not require EIA) will benefit from the application of mitigation measures outlined in the checklist. In situations where the screening process identifies the need for land acquisition, a RAP shall be prepared consistent with OP 4.12.

If there are already existing standard designs, the TCPC or DEC will assess them for impacts on the chosen site and the community; and recommend modification of the designs to include appropriate mitigation measures. For example, if the environmental screening process identifies loss of fertile agricultural fields as the main impact from the construction of a water storage pond, the mitigation measure would be for the TCPC or DEC to choose a site further away from the fertile gardens so that the livelihood systems are maintained.

3.4.2 Environmental and Social Impact Assessment (ESIA)

Though not highly likely, it is conceivable that, as a result of the screening process, one or more of the SRBMP sub-projects (other than the Kamuzu Barrage upgrading) 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. Table 5.1 provides a generic ESMP that could be adapted for relevant SRBMP subprojects.

Where required, preparation of the ESIA (including an ESMP) and the RAP will be carried out in consultation with the relevant stakeholders, including potentially affected persons. The TCPC or DEC, in close consultation with the EAD and on behalf of the City or District Council respectively, will arrange for the:

- (a) Preparation of ESIA terms of reference (general format provided in Annex 6);
- (b) Recruitment of a consultant with both Social and Environmental background and knowledgeable of the World Bank operational safeguards policies, to prepare the ESIA;

- (c) Public consultations and participation; and
- (d) Review and approval of the ESIA through the national ESIA approval process.

The general ESIA process in Malawi, as provided for in the Malawi ESIA Guidelines is presented in Annex 5 and the Procedures for EIA Preparation are presented in Annex 6.

3.5 Sub-project Review and Approval

3.5.1 Review

The TCPC or 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 EIA 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.

3.5.2 Recommendation for Approval/Modification/Disapproval

Based on the results of the above review process and discussions with the relevant stakeholders and potentially affected persons, the TCPC or DEC, in case of projects that don't require EIA, will make recommendations to the City/Town or District Councils to go ahead with project implementation. Where an EIA is required the City/Town or District Councils will recommend to SRBMP 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.

3.5.3 Endorsement

Subsequently, NCE will forward its recommendations on the ESIA, to the Minister responsible for environmental affairs for endorsement. The corresponding RAPs would be reviewed and approved by the Ministry responsible for lands.

3.5.4 Training for the Screening Process

To ensure that the screening form is completed correctly for the various project locations and activities, training will be provided to members of the TCPC, DEC including its DESC and AEC. The Environmental Officer who is responsible for environmental matters of the City Councils or the Environmental District Officer who is the secretariat to the DESC will have to take a leading role in the training. Technical advice on environmental training will also be provided by a contracted safeguards specialist on the SRBMP Technical Team.

3.6 Participatory Public Consultation and Disclosure

According to Malawi's Guidelines for EIA (1997), public consultations and participation are an integral component of the EIA requirements, and the Guidelines identify the following principal elements:

- (a) Developers are required to conduct public consultation and participation during the preparation of Project Briefs and ESIA's;
- (b) The Director of Environmental Affairs may, on the advice of the TCE, conduct his or her own public consultation to verify the works of a developer;
- (c) Formal EIA documents are made available for public review and comments.
- (d) Documents to which the public has access include Project Briefs, ESIA terms of reference, draft and final ESIA reports, and decisions of the DEA regarding project approval;
- (e) The DEA, on advice of the TCE, will develop practices and procedures for making these documents available to the public; and

- (f) Certificates, approving projects will be published by the developer and displayed for public inspection.

Public consultations and participation are critical in preparing an effective proposal for the construction and rehabilitation project activities. These consultations should identify key issues and determine how the concerns of all parties will be addressed in response to the terms of reference for the ESIA, to be carried out for construction and/or rehabilitation proposals.

Annex G of the Guidelines for ESIA (1997) provides details concerning the public consultation methods in Malawi. Such methods include press conferences, information notices, brochures/fliers, interviews, questionnaires and polls, open houses, community meetings, advisory committees, and public hearings. The guidelines for public consultation include, inter alia, a requirement that major elements of the consultation program should be timed to coincide with significant planning and decision-making activities in the project cycle. In terms of the Malawi's EIA process, public consultation and participation should be undertaken during (i) the preparation of the EIA terms of reference; (ii) the carrying out of an EIA; (iii) Government review of an EIA report; and (iv) the preparation of environmental terms and conditions of approval. Further details are provided in *Annex G* of the Malawi's Guidelines for EIA.

For the SRBMP, the first step will be to hold participatory public consultations with the local communities and all other interested/affected parties during the screening process. These consultations will be aimed at briefing the communities about the project activities, how the activities will be carried out and what sectors of the environment are likely to be impacted. The AEC, with the assistance of the Local Leaders, will conduct these public consultations in a participatory manner, to encourage the communities to contribute to the screening process.

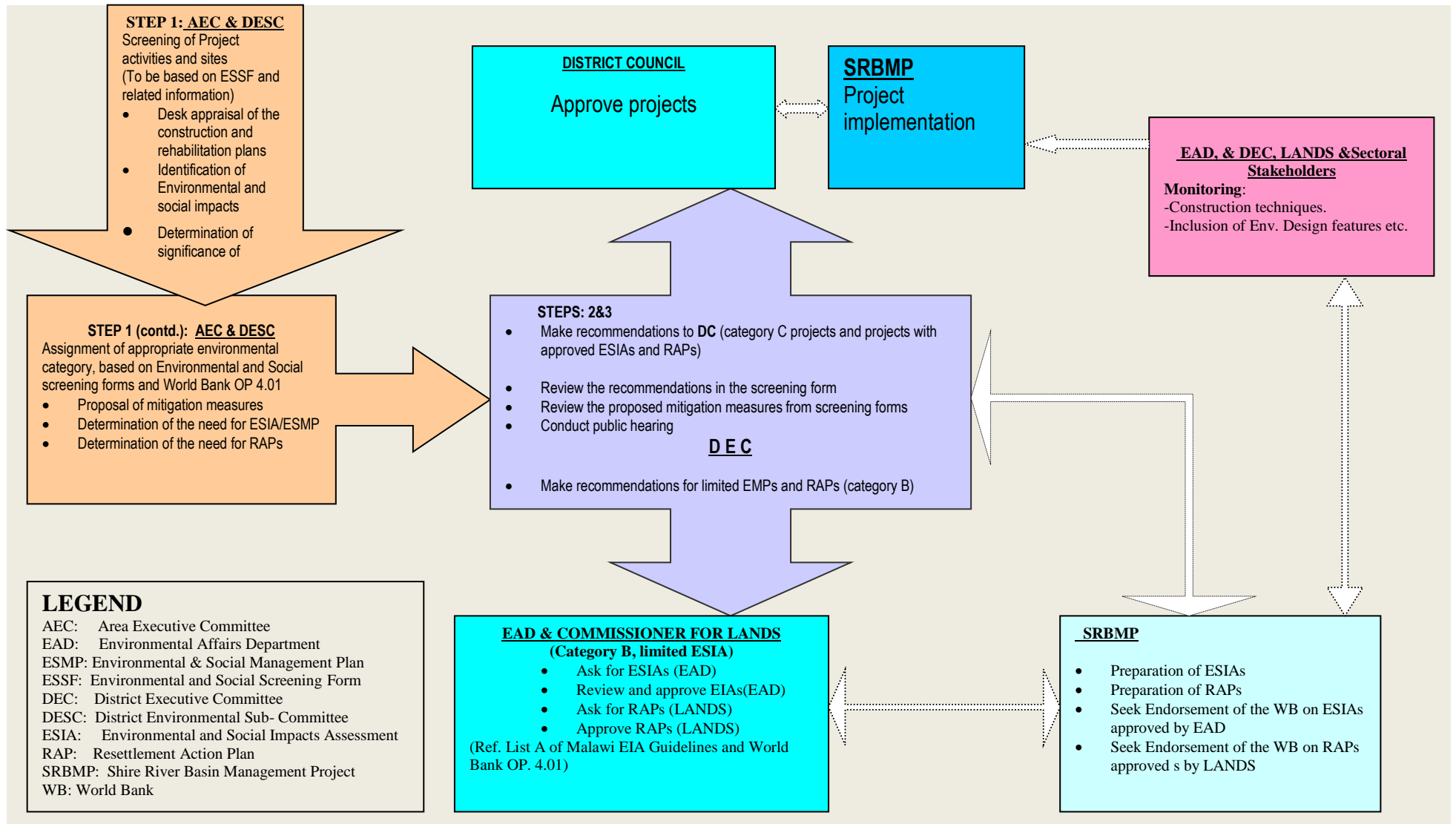
During preparation of the Terms of Reference for an ESIA, City/Town or District Councils (or a consultant) will consult with the EAD to ensure that the TORs are comprehensive enough to cover all sectors of the environment and that they conform to the ESIA procedures as outlined in the ESIA Guidelines. The EAD will also ensure that the social and health impacts of the project activities will be adequately covered in the ESIA report. In the course of preparing the ESIA, the consultant will conduct extensive public consultations to attract and capture comments from the stakeholders, as well as the communities for incorporation in the ESIA report. The stakeholders and communities, including institutions will be asked to contribute to the identification of impacts and to propose mitigation measures for the negative impacts. They will also be asked to comment on how the positive impacts may be enhanced.

When reviewing the ESIA report, the TCE will ensure that the relevant stakeholders, including potentially affected persons, were adequately consulted with regard to the potential impacts of the proposed construction and rehabilitation project activities. Consultation methods suitable for the SRBMP would include workshops, community meetings, public hearings or information notices, which would be organized through the Office of the Chief Executive in the case of a City Council or the District Commissioner in the case of the District Council.

This ESMF has been prepared through public consultations and participation involving the communities in the proposed project areas, Local Leaders, City and District Council Officials and key Government institutions. Copies of the ESMF will be made available to the public through the above channels of communication and in the same manner, ESIA results would be communicated to the various stakeholders. To meet the participatory public consultation and disclosure requirements of the Bank, the Malawi Government will issue a disclosure letter to inform the World Bank of (i) the Government's approval of the ESMF and the RPF-PF; (ii) the actual disclosure of these documents to all relevant stakeholders and potentially affected persons in Malawi, and (iii) the Government's authorization to the Bank to disclose these documents in its Info shop in Washington D.C. The steps

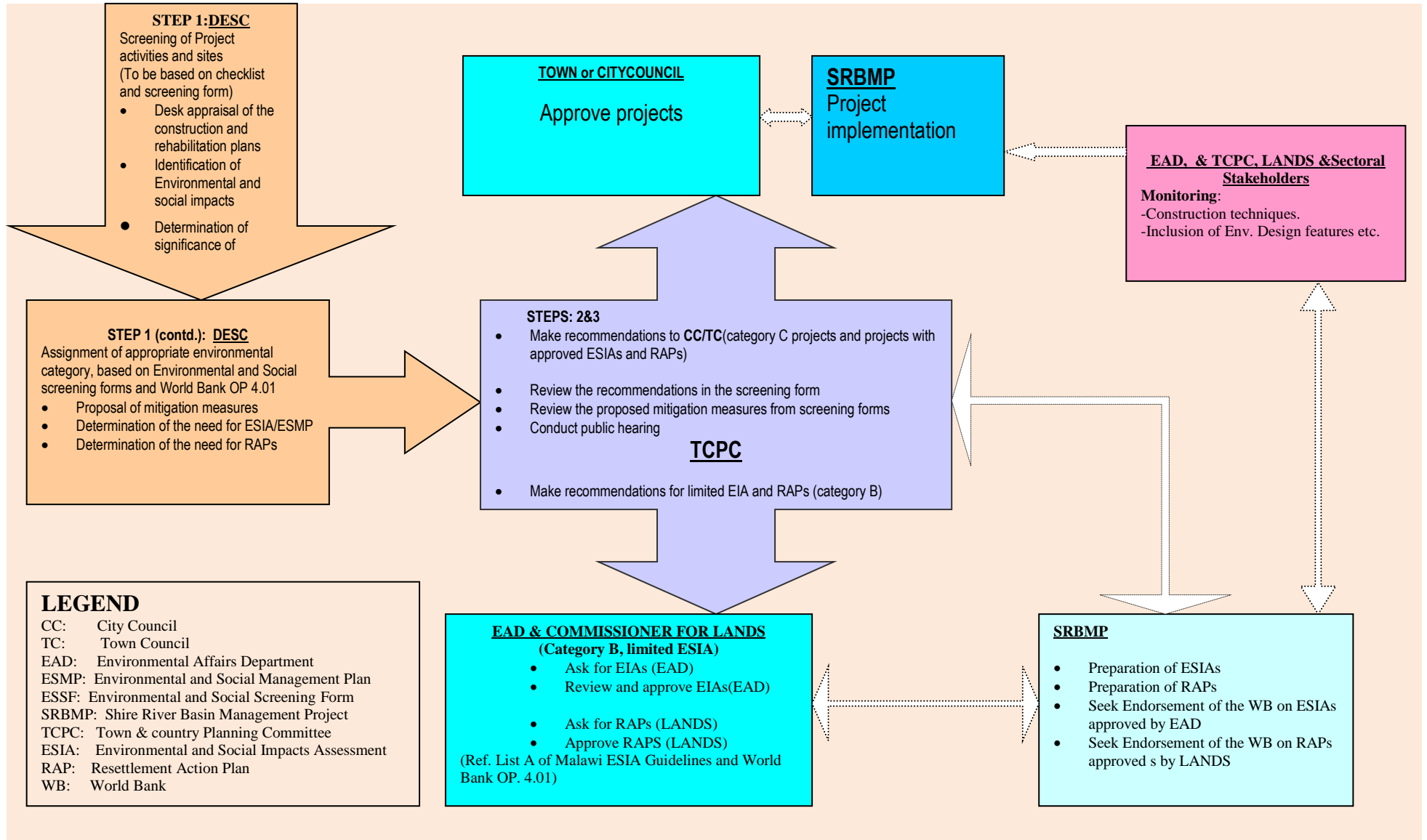
towards disclosure of the safeguard documents have to be completed prior to appraisal of the SRBMP as required by the Bank's Disclosure Policy OP 17.50.

CHART 3.1: FLOW CHART FOR THE ENVIRONMENTAL AND SOCIAL SCREENING AND APPROVAL PROCESS FOR DISTRICT COUNCIL



Designed by Water, Waste & Environment Consultants

CHART 3.2: FLOW CHART FOR THE ENVIRONMENTAL SCREENING AND APPROVAL PROCESS FOR TOWN AND CITY COUNCIL



CHAPTER 4: ENVIRONMENTAL AND SOCIAL IMPACTS

4.1 Environmental and Social Impacts and their Sources

The proposed project activities for the SRBMP are generally designed to improve catchment management of the Shire River Basin; and the SRBMP is designed with environmental sustainability in mind for all components and activities. Environmental impacts of improved coordination in basin water resources management, watershed management and improved regulation of the Shire River, improved climate resilience, and ecosystem improvements are expected to be highly positive overall. Potential positive environmental and social benefits include improved forest conservation and restoration, reduced soil erosion and land degradation, reduced sedimentation in the Shire River and some of its tributaries, and a reduced risk of the Shire River running dry during extended drought.

Environmental and social considerations will be given major attention in Shire River Basin planning, as well as major civil works, to ensure that adverse environmental and social impacts are minimized and adequately mitigated. Component A (*Shire River Basin Planning*), Component B (*Catchment Management*), and Component C (*Water Related Infrastructure*) have very high potential for improving the environmental and social status of the basin. At the same time, certain activities under Component B and C could potentially generate adverse environmental or social impacts requiring mitigation. The Kamuzu Barrage upgrading (Subcomponent C1) is assessed in a separate parallel report, *Preliminary Environmental and Social Impact Assessment of the Kamuzu Barrage* (January 2012).

The following sub-sections analyze the potential positive and negative impacts of the project components and activities of the SRBMP:

4.1.1 Positive impacts

4.1.1.1 Component A: Shire River Basin Planning

The planning, information management, and capacity-building activities to be supported under Component A are all intended to facilitate increased awareness raising to foster ownership, understanding and mainstreaming of environmental and social considerations within water resources planning for the overall Shire River Basin. This component will focus on laying the foundation for integrated investment and planning for water resources management in the Shire River Basin. Under this component, the overall positive impacts will be improvement in institutional arrangements and capacity in the areas of environmental and social management and monitoring. Development of decision support systems; and training, to develop local expertise, is expected to substantially improve the management and monitoring of social and environmental impacts, including consideration for environmental flows in water resources management.

Sub-component A.3 will improve water resources information systems for monitoring water flows and discharges, water quality and sediments, and groundwater. This will enhance the management and monitoring of environmental and social impacts, especially in relation to water quality and sediments. **Positive impacts** generated from activities under Component A include: (i) *improved reporting on comprehensive state of the Shire River Basin*; (ii) *improved water resources information system, awareness and knowledge base on SRBMP*; and (iii) *increased in institutional capacity for coordinated management of the SRBMP*.

4.1.1.2 Component B: Catchment Management.

This component will focus on rehabilitating degraded catchments for sustainable natural resources management and livelihoods, through integrated and participatory approaches. It will introduce

direct significant interventions aimed at repairing and restoring environmental and social integrity to selected catchments within the Shire River Basin.

The investments and activities planned under this component are expected to be environmentally and socially positive overall, without significant adverse environmental and social impacts. These include (i) check dams, gabions, and other small civil works intended to reduce erosion and slow down stream runoffs; (ii) alternative livelihood promotion and income-generating activities, which will be screened to rule out any environmentally and/or socially problematic investments; (iii) community management of natural forests and woodlands on village lands and within the Eastern Escarpment, Tsamba and Mangochi-Namizimu Forest Reserves; and (iv) protected areas management investments in and around the Lengwe and Liwonde National Parks. Sub-component B.2 activities such as establishment of small-scale and mini irrigation facilities to support agriculture and agribusiness; and sub-component B.3 activities for development and start-up of alternative livelihoods, capacity building and improvement of access rural finances. These interventions are expected to generate the following positive impacts:

- Reduction in water run-off, soil erosion and siltation in the Shire River Basin;
- Increased knowledge of applied research and technology for farming systems intensification and efficient technologies (new brick forming machines, small scale solar energy, fuel efficient stoves, eco-sanitation, etc) to reduce fuel wood demand;
- Improved Institutional capacity for catchment planning and monitoring;
- Reduced incidences of flash floods;
- Increase in water table through restoration of forest cover;
- Improved consistency in water flows in the Shire River and its tributaries;
- Improved participatory micro-catchment planning for communities, government technical staff, field NGOs and relevant private sector actors to develop 28 integrated micro-catchment development plans (MCDPs);
- Harmonized and quality standard setting in catchment management programs through national guidelines for integrated catchment management;
- Improved program performance, transparency, accountability and coordination across the Basin due to the monitoring model developed in the program and lesson learning;
- Sustainable and productive agriculture from small scale irrigation, and efficient use of water resources, fertilizers, pesticides, herbicides and IPM etc;
- Improved management and rehabilitation of degraded forests on customary and communal lands;
- Increased income-generating activities, with special targeting of women, youth and landless groups;
- Increased revenues from tourism;
- Reduced people – park conflicts (park management and animals);
- Improved forest management in Eastern Escarpment, Tsamba & Mangochi Forest Reserves;
- Improved food security, nutrition and household incomes;
- Decreased dependence on unsustainable exploitation of forest resources;
- Increase in value of agriculture related products marketed in the targeted GVs by 15 percent;
- Increase in Alternative Livelihoods Through Mobilization, Sensitization and Initial Capacity Building of Common Interest Groups (CIG) for Commercially Oriented Income Generating Activities
- Improved Sub-Catchment Level Market and Access Infrastructure
- Increased Access to Finance Through the Investment Grants to GVs that have reached a certain level of maturity and savings
- Improved Livelihoods from Mini and Small Scale Irrigation, efficient use of agro-chemicals and introduction of IPM

- Improved management of ecological systems within the Shire River Basin;
- Improved tourism in National Parks and Wildlife Reserves;
- Improved income generation at household level within the basin;
- Increase in alternative livelihoods through mobilization, sensitization, and initial capacity building of common interest groups (CIG) for commercially oriented income-generating activities;
- Improved sub-catchment level market and access infrastructure;
- Increased access to finance through the investment grants to GVs that have reached a certain level of maturity and savings.

4.1.1.3 Component C: Water Related Infrastructure

This component aims at mitigating risks from droughts and floods and preparing priority water investments. Several activities under the sub-components will generate positive impacts.

Under sub-component C.1, the upgrading of the Kamuzu Barrage, including refurbishment of the existing bridge, construction of a service and road bridge downstream of the barrage, and construction of a floating steel boom upstream of the barrage is expected to generate the following positive impacts:

- Improved sustainable use of water resources in the Shire River and its tributaries;
- Reduced potential future water use conflicts;
- Improved energy production from existing hydropower stations;
- Improved water availability for hydropower generation, irrigation and water supply;
- Improved road safety and traffic circulation at the current Kamuzu Barrage; and
- Increased employment opportunities.

Under sub-component C.2, positive environmental and social impacts will be generated from the following activities: (i) construction of flood adaptation measures such as flood demarcation structures, elevated platforms, shelters and safe havens; communication and transport equipment for civil protection committees responsible for early flood warning systems, as well as (ii) flood management interventions such as river bank stabilization, dykes, culverts, and flood diversion structures. The positive environmental and social impacts will include:

- Improved protection of human settlements and infrastructure;
- Reduced crop and livestock damage;
- Reduced economic losses and damage to property;
- Improved ecosystem management of the Elephant Marshes;
- Improved sanitation and hygiene; and
- Increased employment opportunities during construction of flood intervention structures.

Activities under sub-component C.3, New Water Investments, will eventually result in positive environmental and social impacts, depending upon which water infrastructure facilities (for irrigated agriculture, hydropower, rural or urban water supply, or other uses) might be built in the future. However, the SRBMP would finance investment preparation studies, but not the civil works themselves. Their implementation would depend upon being deemed viable and attracting future financing, from sources yet to be determined.

4.1.2 Negative Impacts

4.1.2.1 Component A: Shire River Basin Planning

As this component is designed to promote multi-sectoral shared-vision planning approaches to enhance coordinated basin development and management, major negative impacts are not

expected. There are risks of the use of inadequate knowledge base, analysis, and stakeholder consultations in the planning process that would need to be managed. There is also the risk of inadequate consideration of environmental and social information in the planning process. The improvement of the water information systems in sub-component A.3 may have very small-scale land requirements that would need to be addressed.

4.1.2.1 Component B: Catchment Management.

This component will focus on rehabilitating degraded catchments for sustainable natural resources management and livelihoods through integrated and participatory approaches. There are various negative environmental and social impacts that could possibly arise, including:

- Requirement for limited land acquisition due to catchment management activities (e.g. small-scale irrigation development, check dams, passage of irrigation pipes, etc.)
- Restrictions on open-access to grazing by communities in the catchment areas;
- Removal of vegetation from construction sites;
- Water, soil and air pollution from agrochemicals and pesticides use; and
- Increased spread of water borne diseases.

The construction works and operation activities for Component B (e.g. for the establishment of small-scale and mini irrigation facilities or check dams), could possibly generate the following negative impacts:

- Removal of vegetation from construction sites;
- Dust emissions from construction activities;
- Salinization in irrigated fields;
- Potential water pollution from agrochemical use; and
- Water logging and stagnation in irrigated areas.

4.1.2.2 Component C: Water Related Infrastructure

This component could have several negative impacts that would need to be managed:

Kamuzu Barrage Upgrading (Sub-component C.1): The upgrading of the Kamuzu Barrage at Liwonde poses the greatest environmental risk and this is the reason for why the overall Project is classified as Category A by the World Bank. A separate Environmental and Social Impact Assessment and associated Environment and Social Management Plan and Resettlement Action Plan for the Kamuzu Barrage are being developed by a parallel consultancy. To provide project context, some of the observations from this parallel consultancy is provided below:

The most significant environmental and social impacts relate to anticipated changes in the upstream levels of the Shire River and Lake Malawi, as well as downstream Shire River flows. In particular, the Kamuzu Barrage upgrading will, at particular times (mainly during dry seasons), enable the levels of the upstream Shire River and Lake Malawi to be raised by up to 40 cm higher than is possible under the existing barrage. This would affect the surface area and distribution of certain ecosystems within the upstream Liwonde National Park (particularly river sandbars, sandy river banks, and floodplain grasslands), with corresponding impacts on certain wildlife species. Although the level of Lake Malawi would still be subject to natural fluctuations (and the Barrage upgrading will not change the minimum and maximum levels of the Lake), the level could at times be up to 40cm higher than is currently the case, implying more land inundation a higher proportion of the time (especially during dry seasons). The flooding of additional land along Lake Malawi, Lake Malombe, and the Shire River (upstream of Liwonde) would also affect seasonally cultivated areas and other assets (possibly including some dwellings).

Downstream of Liwonde, the upgraded barrage will provide greater opportunities than presently exist to regulate Shire River flows, with potentially greater environmental and social impacts than under the more limited river regulation that is possible with the existing barrage. Barrage construction activities at Liwonde will also produce localized environmental and social impacts during construction, including:

- Land acquisition on both banks of the Shire River and in areas where people need to relocate to make room for new construction works;
- Disruptions to aquatic life and the fishing patterns of local communities due to the construction of temporary coffer dams;
- Traffic disruptions and other temporary disturbances related to construction activities; and
- Extraction and disposal of rocks, earth, and other construction materials;

After construction, bridge traffic over the Shire River at Liwonde is expected to flow more smoothly and safely than is presently the case, due to reduced congestion. Additional information on the environmental and social impacts (positive and negative) of the Kamuzu Barrage upgrading is provided in the parallel report, *Preliminary Environmental and Social Impact Assessment: Independent Environmental Impact Assessment for the Upgraded Kamuzu Barrage* (Government of Malawi, December 2011).

Flood Management (Sub-component C.2): The proposed flood mitigation civil works in the lower Shire River Basin (possibly including riverbank stabilization structures, dykes, culverts, flood diversion structures, and new communication and transport equipment) are expected to have fairly minor adverse environmental or social impacts because they are relatively small-scale and localized. Nonetheless, attention will be needed to address a range of environmental and associated social issues, such as ensuring sufficient river access and crossing points for animals (domestic and wild) and people since the embankments tend to be rather steep-sided. The wetland conservation and management activities planned around the Elephant Marshes are expected to be highly positive from an environmental standpoint. For the civil works to be supported, negative impacts could include:

- Land acquisition on both banks of the Shire River and in areas where people need to relocate to make room for new construction works;
- Increased generation of both liquid and solid waste from construction works;
- Removal of vegetation from construction sites;
- Dust emissions from construction activities;
- Water logging due to water stagnation;
- Increased risk of drowning of wildlife particularly those of Liwonde National Park;
- Barriers to animal or human access to river (to cross or obtain water) where steep embankments are constructed or reinforced for flood protection;

New Water Investments (Sub-component C.3): Although only preparation of new water investments would be supported in this sub-component, these may be sensitive from an environmental and/or social standpoint. The SRBMP would ensure that environmental and social issues are carefully consolidated during preparation of new projects. The planning in Component A would also help improve holistic planning by also examining the environmental and social implications of any proposed new investments in a systems context. Moreover, the Project would support preparation of the environmental and social impact assessments that might be needed for any such new investments.

4.2 Impacts from Pesticides

An increase in irrigation activities is likely to lead to increased chemical pesticides use resulting in the following potential significant impacts:

- Air contamination through application of pesticides;
- Soil and water contamination;
- Risk of pesticides poisoning; and
- Misuse of pesticides

For the SRBMP the impact, with mitigation and promotion of IPM, will be negative medium term and localised.

Chemical pesticides are recommended for use as a last resort, after other methods of pesticide control have failed. A number of cultural methods such as crop variety resistance, pest monitoring, scouting and counting, intercropping and crop rotation would be promoted for the SRBMP, whose primary objective is improve the environmental and socioeconomic sustainability of the Basin. Botanical pesticides such as *tephrosia volgelii*, *neem* and *ginger* and biological methods, which are also used for control of the large grain borer, would also be promoted as part of Integrated Pest Management (IPM), which encourages the use of cultural, biological and other methods as much as possible, in place of chemical methods.

This World Bank's Pest Management policy (OP 4.09) promotes the use of IPM techniques that seek to minimize synthetic pesticide use. It promotes safe use, handling, storage, and disposal of approved chemical pesticides in general. OP 4.09 applies to the SRBMP since certain catchment management and alternative livelihood activities might promote small-scale irrigation or other production systems where pesticides are used. In such special cases, the relevant sub-project investments will include technical assistance to farmers to promote IPM, as well as safe pesticide use where needed. However, the Project will not procure any chemical pesticides and does not involve complex pest management issues that would require a separate Pest Management Plan.

Notwithstanding, any project-supported pesticide procurement for the SRBMP —if needed — would have to comply with the following:

1. Pesticides would have to be procured from registered markets as required by Section 10(2) of the Pesticides Act, 2000. This Act enables Malawi to control the import, export, manufacture, distribution, storage, disposal and use of pesticides. The pesticides would have to be among those registered according to the crops and the target pests and diseases in line with Section 10(2) of the Act and the suppliers would have to show documentation of all import permits and licenses for selling and storage of pesticides as required by the Section.
2. SRBMP would have to solicit the World Bank's prior no-objection to procure the pesticides, alongside IPM practices. This is also in view of the fact that some of the alternative livelihoods development under Component B might involve market development and other promotion of organic crops produced without the use of synthetic compounds. According to OP 4.09, the Bank supports strategies that promote the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides, in assisting borrowers to manage pests that affect either agriculture or public health.

The procurement of any pesticide in a Bank-financed project is contingent on an assessment of the nature and degree of associated risks, taking into account the proposed use and the intended users. For classification of pesticides and their specific formulations, the Bank refers to the World Health Organization's Recommended Classification of Pesticides by Hazard and Guidelines to Classification (Geneva: WHO 1994-95). The following criteria apply to the selection and use of pesticides in Bank-financed projects:

- (a) They must have negligible adverse human health effects.
- (b) They must be shown to be effective against the target species.
- (c) They must have minimal effect on non-target species and the natural environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs must be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them.
- (d) Their use must take into account the need to prevent the development of resistance in pests.

The Bank requires that any pesticides it finances be manufactured, packaged, labelled, handled, stored, disposed of, and applied according to standards acceptable to the Bank. The Bank does not finance formulated products that fall in WHO classes IA and IB, or formulations of products in Class II, if (a) the country lacks restrictions on their distribution and use; or (b) they are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store, and apply these products properly.

4.3 Cumulative Impacts

The Shire River Basin Management Project (SRBMP) and associated longer-term program are intended to improve the management of water and other natural resources within the Shire River Basin. The cumulative impacts of the SRBMP and future follow-up program activities are intended—and expected to be highly positive overall from an environmental and social standpoint. The Strategic Environmental and Social Assessment (SESA) conducted over 2010-2011 developed approaches to promote the consideration of cumulative environmental and social impacts in the development of the Shire River Basin's water resources by examining the close link between people and their environment & natural resources. The investments planned under the SRBMP are closely aligned with the main priorities outlined by the SESA. This includes supporting processes to improve the consideration of cumulative impacts.

Poorly-planned development, especially major investments, in the Shire River Basin through sectoral interventions such as irrigation, hydropower development, water supply, navigation, and industrial development could cause significant cumulative impacts in the form of reducing the performance of existing assets (e.g. if a new large upstream consumptive use was developed), pollution, foreclosure of future water uses, or over-commitment of water resources resulting reduced reliability in water supply and environmental flow. Environmental flow management considerations may include (i) simulating natural seasonal variation in river flows (within defined limits) to promote successful fish reproduction, riverine forest regeneration, flood-recession agriculture, dry-season river sandbar habitat for rare birds, etc.; (ii) maintaining minimum dry-season flows (a major objective of the Kamuzu Barrage, since historically the Shire River has occasionally run dry); (iii) avoiding strong daily fluctuations in the flow of larger rivers (resulting from uncompensated peaking power water releases); and (iv) avoiding sudden major drops in river flows (to prevent fish stranding). Currently, there is little in the way of systematic monitoring to understand where various water and watershed-related activities are being financed by the Government and a variety of development partners; and it is difficult to explore synergies and trade-offs across such activities without appropriate monitoring system, knowledge base, or analytical tools. Investments prepared with poor environmental and social considerations could have significant adverse impacts on the sustainability of the environmental, economic, and social services that the Shire river system provides. These investments would also not take advantage of opportunities of the SRBMP to

enhance positive environmental and social benefits. Major new investments could also have associated induced impacts, such as pollution from enhanced agro-chemical use with large-scale irrigation development, or pollution from enhanced industrialization from improved hydropower development, that would need to be managed.

The project proposes to strengthen the capacity of the Government of Malawi to better manage cumulative and induced impacts in the Shire River Basin. The Basin Planning activities in Component A would support development of a comprehensive basin knowledge base, modelling tools, and stakeholder inputs to examine the cumulative impact of investments. The proposed basin planning approach seeks to move away from the current problematic incremental project-by-project sectoral approach to consider inter-relationships between projects and estimating the cumulative system implications of development across sectors. The monitoring system being supported under Components A and B will set up a framework to provide a systematic tracking of key environmental/natural resources and social parameters in a spatial context across all projects, irrespective of financing, using modern remote sensing/earth observation knowledge products and GIS tools combined with bottom-up monitoring. This would help in auditing activities (e.g. “who is carrying out what activity, in which watershed; and what the status and impact is”), exploring synergies/trade-offs in a larger systems context, and outlining future investment needs in a more systematic manner.

The SRBMP recognizes the existing stock of infrastructure that depends upon water flows from the Shire River, including multiple hydropower stations in the middle Shire River, the Walker’s Ferry pump station that provides drinking water to the City of Blantyre, and the existing Illovo sugar cane and other irrigation systems. There are many ways in which the performance of these existing assets is dependent on the cumulative impacts of other activities in the basin system. For example, the project activities of weed clearance and erosion management can have significant positive impacts in the performance of downstream hydropower plants such as Nkula, Tedzani, and Kapichira in terms of reduced maintenance costs, system interruptions, buffer storage, and hence overall power production. As the number of investments in the Shire River Basin increases, there will be an increasing degree of complexity in the management of cumulative impacts both related to development and management of the resource base. Proposed project support for building a Shire River Basin Institution to improve coordination in planning and management will be critical to address this situation that will otherwise suffer by the “incremental development creep” that has been a problem till this time. Enhanced awareness of the basin issues and options to enable consensus on decisions and behavioural change is critical across key basin stakeholders (such as government officials, farmers, academia, NGOs, development partners, and the general public).

The development of new investments will also have issues of induced and cumulative impacts. The only major investment that the project is supporting is the existing Kamuzu Barrage upgrading and it is unlikely that the enhanced Shire river regulation this will achieve could induce significant additional consumptive water investments in the Basin as this would reduce the reliability and performance of the existing hydropower assets that the upgrade is primarily intended to enhance. Any such new investments would require their own environmental and social impact studies.

The preparation of new investments (e.g. surveys, pre-feasibility, feasibility, or design studies) being supported under sub-component C.3 could have some induced or cumulative impacts depending on the type, location, and scale of investments eventually selected, especially if these prepared investments attract financing and are implemented. The project would support the holistic preparation of such investments, including not only the technical studies, but environmental and social impacts assessment studies. The SRBMP would not finance the civil works for any new large-scale projects (aside from the Kamuzu Barrage upgrading). Any such projects would be subject to the country’s environmental assessment requirements (see *Guidelines for Environmental Impact*

Assessment (EIA) in Malawi, Government of Malawi, 1997), along with the environmental and social safeguards requirements of any external funding source such as the World Bank.

Catchment management activities in Component B could have some induced and cumulative impacts. For example, small-scale check dams or irrigation pilots could be replicated in unsustainable ways in additional inappropriate locations, and both capacity-building and awareness-raising programs will be needed in this regard. Similarly, in flood management activities in sub-component C.2., community-level infrastructure in terms of raised platforms, embankments, etc can be problematic if inappropriately replicated, and therefore capacity-building, good documentation of pilot experiences and awareness-raising will be important.

It is also possible that the SRBMP could set in motion a series of activities that have a more virtuous set of *positive* cumulative or induced impacts. The fact that this project is part of a longer-term program implies that successful paradigms demonstrated under this project in targeted areas may be significantly scaled-up under future phases. For example, scaling-up of successful watershed interventions could result in improved management of priority catchments in other parts of the Basin and beyond for natural resources and livelihood benefit. Basin planning approaches can be developed for other basins in the Country. Positive induced impacts can also be illustrated in the same project. For example, the introduction of real-time hydromet networks as proposed in Component A can induce improved forecasting and early warning systems to flood-affected populations in Nsanje and Chikhwawa targeted in Component C. Enhancing the knowledge base and capacity in key water and land related institutions can manifest themselves beyond their expected role in the project to more effectively manage their other activities.

The main potential generic environmental and social impacts from implementation of SRBMP have been summarized in Table 4.1

Table 4.1: Generic Environmental and Social Impacts and their Corresponding Mitigation and Enhancement Options

SUB-COMPONENT	POTENTIAL IMPACT	NATURE OF IMPACT +ve = Positive -ve = Negative	GENERAL SCORE	MITIGATION/ENHANCEMENT MEASURE
COMPONENT A: SHIRE RIVER BASIN PLANNING				
Sub-Components A1-A4: Shire River Basin Planning	Improved reporting on the state of the Shire River Basin	+Ve	5	Set up and maintain efficient communication channels for full participation of all stakeholders
	Improved water resources information systems, awareness and knowledge base on SRBMP	+Ve	4	Maintain installed information systems such as GSM telemetry and traditional gauging stations in good operating order
	Increased institutional capacity for coordinated management of the Shire River Basin Management Project	+Ve	4	Maintain recommended levels of staffing and adequate resources at all times
COMPONENT B: CATCHMENT MANAGEMENT				
Sub-Component B 1 - 2: Sub-catchment rehabilitation	Reduction in water run-off, soil erosion and siltation in the Shire River Basin	+Ve	4	Sustain appropriate soil conservation techniques through regular refresher trainings; Sustain structures such as check dams, through regular maintenance; Sustain forestation and rural energy interventions to ensure continued supply of alternative biomass resources and fuel.
	Increased knowledge of applied research and technology for farming systems intensification and efficient technologies (new brick forming machines, small scale solar energy, fuel efficient stoves, eco-sanitation, etc) to reduce fuel wood demand	+Ve	3	Facilitate and disseminate technologies that would be user friendly and acceptable to the communities especially women and children. Include the technology user communities during technology planning and design
	Improved catchment management and protection	+Ve	4	Sustain adequate levels of staffing and resources
	Improved Institutional capacity for catchment planning and monitoring	+Ve	4	Conduct regular refresher sensitizations and trainings in catchment management and its importance

Table 4.1: Generic Environmental and Social Impacts and their Corresponding Mitigation and Enhancement Options

SUB-COMPONENT	POTENTIAL IMPACT	NATURE OF IMPACT +ve = Positive -ve = Negative	GENERAL SCORE	MITIGATION/ENHANCEMENT MEASURE
	Reduced incidences of flash floods	+Ve	4	Sustain forestation and rural energy interventions to ensure continued supply of alternative biomass resources and fuel
	Increase in water table through restoration of forest cover	Ve+	3	Plant as many trees as possible in all degraded areas and promote regeneration and protection of natural vegetation
	Improved consistency in water flows in the Shire River and its tributaries	+Ve	4	Maintain and operate the barrage in line with operating procedures.
	Improved participatory micro-catchment planning for communities, government technical staff, field NGOs and relevant private sector actors to develop 28 integrated micro-catchment development plans (MCDPs)	+Ve	4	Consult widely to include and involve all stakeholders and adequately involve women and youth as well as disadvantaged groups to participate in the development of the micro-catchment plans
	Harmonized and quality standard setting in catchment management programs through national guidelines for integrated catchment management	+Ve	3	Consult stakeholders widely during guideline development. Regularly update the guidelines to respond to changing project scope and the environment
	Improved program performance, transparency, accountability and coordination across the Basin due to the monitoring model developed in the program and lesson learning	+Ve	3	Support and supervise the monitoring model and systems to ensure that appropriate targets will be met Identify and remove barriers (such as bureaucracy and political interference) from project implementation to ensure that intended monitoring targets are met without impediment
	Sustainable and productive agriculture from small scale irrigation, and efficient use of water resources, fertilizers, pesticides, herbicides and IPM etc.	+Ve	5	Train stakeholder communities in sustainable agricultural practices and irrigation water management
	Improved management and rehabilitation of degraded forests on customary and communal lands		4	Train communities in forest rehabilitation and management techniques as well as in sustainable use of forest resources
	Restrictions on access to grazing in the protected areas of the catchment	-ve	2	Allocate dedicated areas for grazing and enforce compliance to their utilization

Table 4.1: Generic Environmental and Social Impacts and their Corresponding Mitigation and Enhancement Options

SUB-COMPONENT	POTENTIAL IMPACT	NATURE OF IMPACT +ve = Positive -ve = Negative	GENERAL SCORE	MITIGATION/ENHANCEMENT MEASURE
	Removal of vegetation during construction of small scale structures and larger infrastructure investments	-ve	2	Restrict vegetation removal only to areas for construction. Re-vegetate bare areas after construction
	Increased spread of water related diseases	-ve	2	Design small-scale structures appropriately to avoid water stagnation Cut grass around small earth dams to discourage breeding of mosquitoes
Sub-Components B 3 & 4: Sub-catchment rehabilitation, Alternative livelihoods and Ecological management	Increased income-generating activities, with special targeting of women, youth and landless groups	+Ve	5	Sustain empowerment of women, youth and landless groups through regular trainings and sensitization meetings
	Increased revenues from tourism	+Ve	5	Sustain catchment protection, flood attenuation, biodiversity conservation and carbon sequestration.
	Reduced people – park conflicts (park management and animals)	+Ve	4	Sensitize communities on the park rules and regulations and enforce them Implement co-management plans for parks
	Improved forest management in Eastern Escarpment, Tsamba & Mangochi Forest Reserves	+Ve	4	Sensitize communities in the co-management model and regularly review its strategies and implementation procedures in line with lessons learnt on the ground.
	Improved food security, nutrition and household incomes	+Ve	5	Promote agricultural diversification with the full participation of smallholder farmers including women, youth and the landless.
	Decreased dependence on unsustainable exploitation of forest resources	+Ve	4	Promote alternative energy sources and support community woodlots
	Increase in value of agriculture related products marketed in the targeted GVs by 15 percent.	+Ve	4	Assist farmers to form cooperative for price bargaining and processing of produce into value added products
	Increase in alternative livelihoods through mobilization, sensitization, and initial capacity	+Ve	3	Link CIGs to markets for products of income generating activities.

Table 4.1: Generic Environmental and Social Impacts and their Corresponding Mitigation and Enhancement Options

SUB-COMPONENT	POTENTIAL IMPACT	NATURE OF IMPACT +ve = Positive -ve = Negative	GENERAL SCORE	MITIGATION/ENHANCEMENT MEASURE
	building of common interest groups (CIG) for commercially oriented income-generating activities			
	Improved sub-catchment level market and access infrastructure	+Ve	3	Train community leaders in community mobilization and task distribution to include women and youth during construction of market and access infrastructure
	Increased access to finance through the investment grants to GVs that have reached a certain level of maturity and savings.	+Ve	5	Design appropriate, transparent and credible mechanisms for determining level of maturity and savings Provide financial management training
	Improved livelihoods from mini and small scale irrigation	+Ve	4	Link farmers to markets for produce and value added products from irrigation.
	Salinization and water logging in irrigation schemes	-Ve	2	Train communities on irrigation water management and efficient application of fertilizers
	Water, air and soil pollution from agrochemicals and pesticides use Poisoning and misuse of pesticides	-Ve	3	Train communities on safe use, storage and disposal of agrochemicals. Implement IPM
COMPONENT C: WATER RELATED INVESTMENTS				
Sub-Component C 1: Kamuzu Barrage	Improved sustainable use of water resources in the Shire River and its tributaries	+Ve	5	Regularly sensitize communities and water users on water rights and their implications. Monitor water users to comply with water permits
	Reduced potential future water use conflicts	+ve	4	Regularly sensitize e communities and water users on water rights and their implications. Monitor water users to comply with water permits

Table 4.1: Generic Environmental and Social Impacts and their Corresponding Mitigation and Enhancement Options

SUB-COMPONENT	POTENTIAL IMPACT	NATURE OF IMPACT +ve = Positive -ve = Negative	GENERAL SCORE	MITIGATION/ENHANCEMENT MEASURE
	Improved energy production from existing hydropower stations	+Ve	4	Operate and maintain the barrage according to the recommended operating procedures.
	Improved water availability for hydropower generation, irrigation activities and water supply	+Ve	4	Harvest weeds as recommended to facilitate free flow of water to the power generation plants
	Improved road safety and traffic flow at the Kamuzu barrage	+ve	2	Provide adequate appropriate traffic warning signs to alert people on the traffic separation at the gates.
	Increased employment opportunities	+Ve	3	Recruit workers from within the project site
	Land acquisition for construction works	-ve	4	Provide adequate compensation to affected persons
	Disruptions to aquatic life and the fishing patterns of local communities due to the construction of temporary coffer dams	-ve	4	Provide for minimum flow in the engineering design as recommended by the Water Resources Department
	Increased risk of drowning for wildlife particularly those of Liwonde National Park	-ve	3	Provide fencing in all areas that pose risk to wildlife drowning
	Disturbance to flow of traffic	-ve	3	Limit number of trucks transporting construction materials during peak traffic periods Providing detours and appropriate traffic signs for vehicles and pedestrians
	Generation of construction waste (rocks, earth, and other construction materials)	-ve	2	Dispose all rubble and solid wastes from the site at recommended dumping sites
Improved weed management and reduced handling costs	+Ve	3	Operate and maintain the boom as recommended	
Sub-Component C 2: Improved	Improved protection of human settlements and infrastructure	+Ve	5	Maintain flood intervention structures regularly and provide early flood warning signs as recommended
	Reduced crop and livestock damage	+Ve	4	Sensitise beneficiaries on the need to care for the flood
	Reduced economic losses and damage to property	+Ve	4	

Table 4.1: Generic Environmental and Social Impacts and their Corresponding Mitigation and Enhancement Options

SUB-COMPONENT	POTENTIAL IMPACT	NATURE OF IMPACT +ve = Positive -ve = Negative	GENERAL SCORE	MITIGATION/ENHANCEMENT MEASURE
				intervention structures
	Improved ecosystem management of the Elephant Marshes	+Ve	3	Drafting of legislation for the protection and management of the Elephant Marsh should be finalised to support its protection through maintenance of the buffer capacity
	Improved sanitation and hygiene	+Ve	2	Sensitise communities on the negative health impacts associated with flooding
	Increased employment opportunities during construction of flood intervention structures	+Ve	3	Recruit workers from within the project areas
	Increased generation of both liquid and solid waste from construction works	-ve	2	Provide approved temporary toilets and dispose solid waste in approved sites
	Dust emissions from construction activities	-ve	1	Spray water on dusty construction areas and sites. Provide dust masks to workers exposed to dust and ensure that they wear them
	Barriers to animal or human access to river where steep embankments are constructed or reinforced for flood protection	-Ve	2	Provide for gently-sloping river banks at key access points Provide alternative sources of water

CHAPTER FIVE: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

5.1 Environmental and Social Management Plan

The purpose of the Environmental and Social Management Plan (ESMP) is to ensure that the identified environmental and social impacts for the respective subprojects (i) if negative are adequately mitigated, and (ii) if positive are adequately mainstreamed and enhanced throughout the project lifecycle.

For each SRBMP subproject requiring an ESIA or simply an ESMP, the ESMP will:

- a Lists the potential social and environmental impacts;
- b Provide the mitigation or enhancement measures for each single or cumulative impact;
- c Assign the responsible institutions to carry out the mitigation or enhancement measures;
- d Propose dates by which the mitigation measures must be carried out; and
- e Give an estimate of the cost for implementing the mitigation measures.

For the SRBMP, the ESMPs will have to be designed to suit specific project activities on the respective sites. In this regard, Table 5.1 is a generic frame to guide the prediction of specific potential impacts of the SRBMP activities.

The generic or typical environmental impacts in Table 5.1 were derived from field investigations, public consultations and professional judgment, with respect to the proposed SRBMP activities. The list of impacts is by no means exhaustive since the actual impacts will depend on the specific project activity and location.

Once the specific ESMPs have been developed for the SRBMP activities, flexibility should be allowed to optimize its implementation and to take into account any future changes or modifications made on the location and the design of the project activities.

Costs for management of the identified environmental and social impacts are assumed to be included in the project activities since they, in themselves, are designed for managing the existing environmental and social issues within the basin. Notwithstanding, some of the project-specific impacts may attract costs depending on the impacts and the project sites.

Table 5.1: Generic Environmental and Social Management Plan						
POSITIVE IMPACTS						
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	TARGET	RESPONSIBLE INSTITUTION	COST PER YEAR AND SOURCE OF FUNDS	
1.0 IMPACTS FROM COMPONENT A: SHIRE RIVER BASIN PLANNING						
1.1	Improved water resources information systems, awareness and knowledge base on SRBMP	Set up and maintain efficient communication channels for full participation of all stakeholders	During development of basin planning framework	SRBMP MWDI	Include in the project costs under component A	
1.2	Improved reporting on comprehensive state of the Shire River Basin	Maintain installed information systems such as GSM telemetry and traditional gauging stations in good operating order				
1.3	Increased institutional capacity for coordinated management of the Shire River Basin Management Project	Maintain recommended levels of staffing and adequate resources at all times				
2.0 IMPACTS FROM COMPONENT B: CATCHMENT MANAGEMENT						
2.1	Reduction in run-off water, soil erosion and siltation in the basin	Sustain appropriate soil conservation techniques through regular refresher trainings	Annually throughout project life	SRBMP Dept. of Land Resources Conservation	Included in ESMF training and capacity building	
		Sustain efficiency of structures such as check dams, through regular maintenance;	Annually during project implementation	SRBMP MWDI	Recurrent MWDI budgets through Water Resources Dept.	
		Sustain forestation and rural energy interventions to ensure continued supply of alternative biomass resources and fuel	Annually during implementation	SRBMP, DOE Department of Forestry & EAD	From Project Costs under component B	
2.2	Increased knowledge of applied research and technology for farming systems intensification and efficient technologies (new brick forming machines, small scale solar energy, fuel efficient stoves, eco-	Facilitate and disseminate technologies that would be user friendly and acceptable to the communities especially women and children.	Annually during project implementation	SRBMP, DOE	From Project Costs under component B	

Table 5.1: Generic Environmental and Social Management Plan						
POSITIVE IMPACTS						
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	TARGET	RESPONSIBLE INSTITUTION	COST PER YEAR AND SOURCE OF FUNDS	
	sanitation, etc) to reduce fuel wood demand	Include the technology user communities during technology planning and design		SRBMP	Not applicable	
2.3	Improved catchment management and protection	Sustain adequate levels of staffing and resources	Annually during implementation	SRBMP MWDI	From recurrent budgets for responsible institutions	
2.4	Improved Institutional capacity for catchment planning and monitoring	Conduct regular refresher trainings in catchment management and its importance		DLRC	Included in ESMF training	
2.5	Reduced incidences of flash floods	Sustain forestation and rural energy interventions to ensure continued supply of alternative biomass resources and fuel	Annually during implementation	SRBMP, DOE MWDI District Council DNRDM	From Project Costs under component B	
2.6	Increase in water table through restoration of forest cover	Plant as many trees as possible in all degraded areas and promote regeneration of natural vegetation	Annually throughout project period	SRBMP Department of Forestry	Costs included in project costs under component B	
2.7	Improved consistency in water flows in the Shire River and its tributaries	Maintain and operate the barrage in line with operating procedures.	Throughout the project life	SRBMP, Water Resources Dept	From recurrent MWDI budget	
2.8	Improved participatory micro-catchment planning for communities, government technical staff, field NGOs and relevant private sector actors to develop 28 integrated micro-catchment development plans (MCDPs)	Consult widely to include and involve all stakeholders and adequately involve women and youth as well as disadvantaged groups to participate in the development of the micro-catchment plans	During project planning	SRBMP MWDI	Included in project costs under Component B	
2.9	Harmonized and quality standards setting in catchment management programs through national guidelines for integrated catchment	Consult stakeholders widely during guideline development.	Before project implementation	SRBMP MWDI	Include in project costs under Component B	

Table 5.1: Generic Environmental and Social Management Plan						
POSITIVE IMPACTS						
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	TARGET	RESPONSIBLE INSTITUTION	COST PER YEAR AND SOURCE OF FUNDS	
	management	Regularly update the guidelines to respond to changing project scope and the environment				
2.10	Improved program performance, transparency, accountability and coordination across the Basin due to the monitoring model developed in the program and lesson learning	Support and supervise the monitoring model and systems to ensure that appropriate targets will be met Identify and remove barriers (such as bureaucracy and political interference) from project implementation to ensure that intended monitoring targets are met without impediment	Annually during project implementation	SRBMP MWDI	From recurrent MWDI budgets	
2.11	Sustainable and productive agriculture from small scale irrigation, and efficient use of water resources etc.	Train stakeholder communities in sustainable agricultural practices and irrigation water management	Annually during project implementation	SRBMP MAFS	Included in ESMF training	
2.12	Improved management and rehabilitation of degraded forests on customary and communal lands	Train communities in forest rehabilitation and management techniques as well as in sustainable use of forest resources	Annually during project implementation	SRBMP DLRC	Included in ESMF training under capacity building	
2.13	Increased income-generating activities, with special targeting of women, youth and landless groups	Sustain empowerment of women, youth and landless groups through regular trainings and sensitization meetings	Annually during project implementation	SRBMP Ministry of Gender	SRBMP to support training activities through MGCSW budgets	
2.14	Increased revenues from tourism	Sustain catchment protection, flood attenuation, biodiversity conservation and carbon sequestration programmes	Annually during project implementation	SRBMP DNPW	From DNPW recurrent budgets	

Table 5.1: Generic Environmental and Social Management Plan						
POSITIVE IMPACTS						
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	TARGET	RESPONSIBLE INSTITUTION	COST PER YEAR AND SOURCE OF FUNDS	
2.15	Reduced people – park conflicts (park management and animals)	Sensitize communities on the park rules and regulations and enforce them Implement co-management plans for parks	Quarterly throughout project implementation	DNPW District Council	From DNPW recurrent budgets with support from SRBMP	
2.16	Improved forest management in Eastern Escarpment, Tsamba & Mangochi Forest Reserves	Sensitize communities in the co-management model and review its strategies and implementation procedures in line with lessons learnt on the ground.	Bi-annually during project implementation	Department of Forestry	From Forestry Dept recurrent budgets	
2.17	Improved food security, nutrition and household incomes	Promote agricultural diversification with full participation of smallholder farmers including women, youth and the landless.	Annually during project implementation	MAFS	From MAFS recurrent budget	
2.18	Decreased dependence on unsustainable exploitation of forest resources	Promote alternative energy sources and support community woodlots	Throughout project life	Department of Energy and EAD	From recurrent DOE and EAD budgets with support from SRBMP	
2.19	Increase in value of agriculture related products marketed in the targeted GVs by 15 percent.	Assist farmers to form cooperative for price bargaining and processing of produce into value added products	Throughout project life	SRBMP MAFS	From recurrent MAFS budgets with support from SRBMP	
2.20	Increase in alternative livelihoods through mobilization, sensitization, and initial capacity building of common interest groups (CIG) for commercially oriented income-generating activities	Link CIGs to markets for products of income generating activities.	Throughout project life	SRBMP MAFS MTI	From recurrent MAFS and MTI budgets	
2.21	Improved sub-catchment level market and access infrastructure	Train community leaders in community mobilization and task distribution to include women and youth during construction of	Bi-annually throughout project implementation	District Council MGCSW	From SRBMP funds for allocated for training	

Table 5.1: Generic Environmental and Social Management Plan						
POSITIVE IMPACTS						
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	TARGET	RESPONSIBLE INSTITUTION	COST PER YEAR AND SOURCE OF FUNDS	
		market and access infrastructure				
2.22	Increased access to finance through the investment grants to GVs that have reached a certain level of maturity and savings.	Design appropriate, transparent and credible mechanisms for determining level of maturity and savings	Annually during project implementation	District Council SRBMP	From SRBMP funds allocated for IGAs	
		Provide financial management training				
2.23	Improved livelihoods from mini and small scale irrigation	Link farmers to markets for produce from irrigation	Annually during project implementation	MAFS Irrigation Dept	From recurrent MAFS budgets	
3.0 IMPACTS FROM COMPONENT C: WATER RELATED INFRASTRUCTURE						
3.1	Improved sustainable use of water resources in the Shire River and its tributaries	Regular sensitization of communities and water users on water rights and their implications.	During project construction, operation and maintenance	SRBMP	Included in ESMF training under capacity building	
		Monitor water users to comply with water permits				
3.2	Reduced future potential water use conflicts	Regularly sensitize communities on water use rights	During development of basin planning framework	SRBMP MWDI	Included in ESMF training	
		Monitor water users to comply with water permits				
3.3	Improved energy production from existing hydropower stations	Operate and maintain the barrage according to the recommended operating procedures.	During project implementation	ESCOM SRBMP DOE	Included in recurrent budgets from responsible institutions Included in project	
3.4	Improved water availability for hydropower generation, irrigation, and water supply	Harvest weeds as recommended to facilitate free flow of water to the power generation	During project implementation	SRBMP, MWDI DOE		

Table 5.1: Generic Environmental and Social Management Plan						
POSITIVE IMPACTS						
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	TARGET	RESPONSIBLE INSTITUTION	COST PER YEAR AND SOURCE OF FUNDS	
		plants		ESCOM	costs	
3.5	Improved road safety and traffic flow at the Kamuzu barrage	Provide adequate appropriate traffic warning signs to alert people on the traffic separation at the gates	During project construction	SRBMP MTPW NRSC	Contractor's bills	
3.6	Increased employment opportunities	Recruit workers from within the project site	During project construction	SRBMP	From project funds	
3.7	Improved weed management and reduced handling cost	Operate and maintain the boom as recommended	During project implementation	SRBMP MWDI	MWDI	
3.8	Improved protection of human settlements and infrastructure	Implement integrated Flood Risk Management Plan (IFRMP) to benefit approximately 40,000 households in the flood-prone areas in terms of better preparedness and reduced vulnerability Maintain flood intervention structures regularly and provide early flood warning signs as recommended Sensitise beneficiaries on the need to care for the flood intervention structures	Annually during project implementation	SRBMP DNRDM	SRBMP	
3.9	Reduced crop and livestock damage		Annually during project implementation	SRBMP, MWDI Do NR&DRM	From recurrent budgets for MAFS	
3.10	Reduced economic losses and damage to property					
3.11	Improved ecosystem management of the Elephant Marshes	Drafting of legislation for the protection and management of the Elephant Marsh should be finalised to support its protection through maintenance of the buffer capacity	Before project implementation	Department of National Parks and Wildlife	from recurrent budgets for DNPW	

Table 5.1: Generic Environmental and Social Management Plan						
POSITIVE IMPACTS						
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	TARGET	RESPONSIBLE INSTITUTION	COST PER YEAR AND SOURCE OF FUNDS	
3.12	Improved sanitation and hygiene	Sensitise communities on the positive and negative health impacts associated of flooding	Annually during project implementation	Department of Sanitation and Hygiene	From recurrent budgets the ministry responsible for health	
3.13	Increased employment opportunities during construction of flood intervention structures	Recruit workers from within the project areas	Quarterly during construction period	Dept. of Labour District Council	From SRBMP funds	

Table 5.1: Generic Environmental and Social Management Plan					
NEGATIVE IMPACTS					
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED MITIGATION MEASURES	TARGET	INSTITUTION	COST
2.0 IMPACTS FROM COMPONENT B: CATCHMENT MANAGEMENT					
2.1	Restrictions on access to grazing in the protected areas of the catchment	Allocate dedicated areas for grazing and enforce their use	Before and during project implementation	SRBMP DLRC	Not Applicable
2.2	Removal of vegetation during construction of small scale structures and larger infrastructure investments	Restrict vegetation removal only areas for construction	During construction	SRBMP; District Council, Contractors	Not Applicable
		Re-vegetate bare areas after construction	After construction works	Contractors	To be included in Contractor's budget
2.3	Water and soil pollution from agrochemicals and pesticides use	Train communities on safe use, storage and disposal of agrochemicals and pesticides	Annually during implementation	Water Resources Dept, PCB, MAFS	Included in budget for

Table 5.1: Generic Environmental and Social Management Plan					
NEGATIVE IMPACTS					
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED MITIGATION MEASURES	TARGET	INSTITUTION	COST
	Poisoning and misuse of pesticides				capacity building and training
2.4	Salinization and water logging in irrigation schemes	Train communities on irrigation water management and efficient application of fertilizers		Department of Irrigation	
3.0 IMPACTS FROM COMPONENT C: WATER RELATED INFRASTRUCTURE					
3.1	Land acquisition for construction works	Provide adequate compensation to affected persons	During construction	SRBMP, MoLH DC, Consultant	To be provided for specified in RAPs
3.2	Disruptions to aquatic life and fishing patterns of local communities due to construction of temporary coffer dams	Provide for minimum flow in the engineering design as recommended by the Water Resources Department	During construction	SRBMP Water Resources Dept	Not applicable
3.3	Increased spreading of water related diseases	Design small-scale structures appropriately to avoid water logging and stagnation Cut grass around small earth dams to discourage breeding of mosquitoes	During planning and design During operation and maintenance	SRBMP Communities	Include in bills of quantities for contractors Provide for in routine maintenance
3.4	Disturbance to flow of traffic	Limit number of trucks transporting construction materials during peak traffic periods Providing detours and appropriate traffic signs for vehicles and pedestrians	During construction	SRBMP Contractors	Included in bills of quantities for contractors

Table 5.1: Generic Environmental and Social Management Plan					
NEGATIVE IMPACTS					
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED MITIGATION MEASURES	TARGET	INSTITUTION	COST
3.5	Generation of construction waste (rocks, earth, and other construction materials)	Dispose all rubble and solid wastes from the site at recommended dumping sites	During construction	SRBMP, DC Contractors	Not applicable
3.6	Increased generation of both liquid and solid waste from construction works	Provide approved temporary toilets and dispose solid waste in approved sites	During construction	Contractor SRBMP	Contractor's bills
3.7	Dust from construction activities	Spray water on dusty areas on construction sites. Provide dust masks to workers exposed to dust	During construction	Contractors Consultant	Contractor's bills
3.8	Increased risk to drowning of wildlife	Provide fencing in all areas that pose risk to wildlife drowning; include gently-sloping edges to farm ponds	During construction	Contractors DNPW	Project funds for component C
3.9	Barriers to animal or human access to river where steep embankments are constructed or reinforced for flood protection	Provide for gently-sloping river banks at key access points Provide alternative sources of water	During construction	SRBMP DNPW	Not applicable
3.10	Threats to survival of native fish species, due to introduction of non-native species into fish ponds.	Project will not support work with fish species that are not native to the same catchment area.	During operation	SRBMP	Not applicable

***Note: Exchange rate: US\$1=MK310**

5.2 Environmental and Social Monitoring and Evaluation

5.2.1 Scope of Environmental and Social Monitoring

Environmental and social monitoring and evaluation will be a continuous process and will form an integral part of the monitoring plan for the entire project. It will have three broad components:

- Performance monitoring will measure progress on environmental and social change or performance against scheduled actions and milestones, using input and output indicators.
- Impact monitoring will measure effectiveness of the change and will facilitate identification of constraints and making recommendation for appropriate corrective measures. Impact monitoring will generate current data to compare with baseline conditions.
- A final environmental and social evaluation by an independent agency will assess and present outstanding issues for attention, prior to the closing of the project activities.

Environmental and social monitoring and evaluation for the SRBMP will focus on the activities and/or mitigation measures prescribed in the EMP for the identified environmental and social impacts. The Environmental and Social Monitoring Plans will facilitate:

- Generation of information on the overall progress in achieving environmental sustainability throughout the project;
- Evaluation of the efficiency of mitigation and enhancement measures;
- Updating of the baseline data, impacts and mitigation plan;
- Adoption of additional mitigation measures if the present measures are insufficient;
- Reviewing of the costs incurred and how they relate to the budgetary provisions in the EMP; and
- Development of an environmental and social management database for observation of continuous trends and possible modification of the EMP to optimize environmental protection at all stages of project cycle.

Environmental and social monitoring is an essential component of the SRBMP implementation, particularly in view of the fact that restoration of environmental integrity of the Basin is one of the key areas of focus for the project. It will facilitate and ensure follow-up on implementation of the proposed enhancement/mitigation measures. It will also provide a window to anticipate possible environmental hazards and/or detect unpredicted impacts over time. The monitoring process will include:

- Selection of environmental and social parameters at specific locations and for specific environmental components, in line with the sub-project EMPs;
- Visual observations of impacts on environmental and social components;
- Consultation with the key stakeholders and communities; and
- Sampling and regular testing of the key parameters for which appropriate indicators are provided in the Monitoring Plan

Monitoring will be undertaken at different levels and times as follows:

- a) Environmental and social monitoring will be undertaken, as required in the EMP, by the Construction Supervision Consultant (CSC) at the work sites during project implementation. He will include the monitoring reports in his regular project reports to the SRBMP and send copies of the monitoring reports to the Director of Planning and Development (DPD) for the particular district.
- b) The DPD will, through the DESC (lead by the Environmental District Officer (EDO)); verify the environmental and social monitoring reports from the CSC. DESC (composed of the various line district level officers of the stakeholder institutions appearing in the monitoring plan) will monitor their specialized technical areas and contribute to the comprehensive district monitoring reports to be presented to the District Executive Committee (DEC) by the DPP. The DEC will subsequently provide their comments and recommendations on necessary action to improve the implementation of the EMPs.
- c) Monitoring reports, reviewed by the DEC, together with the appropriate recommendations therein will be submitted to the Environmental Affairs Department (EAD). The EAD, with assistance from the Environmental Officer for SRBMP, will compile a comprehensive monitoring report (to include inputs from all the sectors not represented at the district). The EAD will either:
 - Present the monitoring report to the Technical Committee on Environment, TCE, (for technical review and comments, where there are complicated issues to be dealt with); or
 - Present the report directly to the MSTT, if it is straight forward, with only simple environmental and social issues to be dealt with.

In this respect, EAD will determine whether the report has to be reviewed by the TCE or not, before presenting it to the MSTT.

After the review by the TCE (where necessary), EAD will compile the revised monitoring report and present it to the MSTT for their endorsement and appropriate management decision and recommendations. Thereafter, SRBM will submit the revised report, with the updated EMP to the CSC for implementation of the appropriate recommended actions in the field. The SRBMP will provide copies of the report endorsed by the MSTT to EAD for briefing the TCE and NCE.

The MSTT will undertake independent monitoring of selected parameters to verify the results of the monitoring reports and to audit implementation of environmental mitigation measures contained in the EMP. This will include monitoring land acquisition and compensation issues as outlined in any RAP prepared for the SRBMP activities.

5.2.2 Parameters to be monitored

Some of the key generic monitoring parameters recommended for the SRBMP are presented in Table 5.3A and discussed this Section. Specific parameters will have to be developed for each sub- project once the project activities and sites have been defined:

5.2.2.1 Physical Environment

5.2.2.1.1 Soils

Soil excavation for the establishment of temporary borrows pits, access roads; works camp and storage facilities will lead to soil erosion. The CSC should therefore enforce erosion control mitigation measures particularly on work sites where soil is disturbed. Monitoring should consist of visual inspection of eroded sites and measurement of the gullies formed.

5.2.2.1.2 *Water Resources*

The Project may alter the flow regime in the rivers in the Shire River Basin, resulting in fluctuations in water levels downstream thereby negatively impacting on downstream water users and the river channel. Monitoring should consist of recording downstream river levels to assess the effects on downstream water users and downstream channel (river banks) stability, as well as riparian habitats. Based on this monitoring, an assessment should be made to determine the need to develop and implement additional mitigation measures.

5.2.2.1.3 *Water Quality Monitoring*

Construction camps are often a source of significant surface and groundwater pollution if not sited and managed properly. It is recommended therefore that the CSC should monitor effluent, wastewater, or rainfall runoff discharged from campsites to ensure that the Contractor installs appropriate wastewater treatment facilities. The parameters to be analyzed for water monitoring may include: Temperature, pH, Electrical Conductivity (EC), Suspended Solids (SS), Turbidity, Ammonia (NH₄⁺), Nitrates (NO₃⁻), Total Nitrogen, Total Phosphorus, Filterable Iron (Fe), Dissolved Oxygen (DO), Biological Oxygen Demand (BOD), Grease and oil and e-coli. Where the discharged effluent does not meet the Malawi Bureau of Standards (MBS) or the World Health Organization (WHO) standards, the Contractor must take further treatment measures before discharging effluent into nearby watercourses.

5.2.2.2 Biological Environment

5.2.2.2.1 *Vegetation*

Works camps and storage sites should be located in areas of least disturbance to native vegetation and this should be monitored by the CSC. After these sites have been vacated, they must be rehabilitated and inspected by the DESC.

During the operation phase particularly for dams, a monitoring program should specifically target the impacts of high water levels on habited and cultivated areas. Proportion of vegetation composition should be assessed every year by noting the change in vegetation structure due to different water levels. Vegetation zone boundaries can be verified using a GPS, and establishing fixed GPS monitoring points. Photographs should be taken during the same season and on approximately the same dates. In addition, the general species composition, plant height, plant distribution and species composition should be recorded for each monitoring site.

5.2.2.2.2 *Terrestrial Wildlife*

Animal species populations (e.g. crocodiles, elephants, hippopotamus and waterbucks) should be monitored every year to assess changes in population, in relation to the Project Activities. Parameters to be measured include the population size and reproductive success of these species.

5.2.2.3 Socio-economic Environment

5.2.2.3.1 *Monitoring of Resettlement and Compensation*

Monitoring should be undertaken in accordance with the requirements of RAPs prepared for the sub-projects. Some of the parameters to be measured include the number of people adequately compensated for loss of property, number of complaints against compensation amounts and the size of land acquired etc. Specific parameters will be provided in the RAPs.

5.2.2.3.2 *Accidents and Health*

Health surveys should be carried out by the District Health Officer's (DHO's) staff that will have the overall responsibility to ensure that all health related measures are put in place and

that appropriate mitigation measures are enforced. The CSC will assist the DHO to ensure that the contractors fulfil the health requirements. The following parameters are examples of proposed indicators for monitoring health related impacts of the Project:

- Number of cases of malaria by sex and age groups;
- Number of cases of bilharzias by sex and age groups;
- Number of cases of STI seen at the facilities, by sex, age groups and types;
- Knowledge on key HIV/AIDS issues among the young and adult population;
- Number of people counselled for HIV/AIDS;
- Number of cases of work related accidents by sex and age groups and types;
- Number of cases and types of work related injuries seen in the health facilities;
- Drinking water quality (surface and / or groundwater) in relation to concentration of contaminants compared with permissible WHO or MBS values;
- Number of posted warning signs at work sites compared with the recommended;
- Availability of adequate sanitary facilities at campsites; and
- Level of community awareness on dangers/risks associated with Project activities

5.2.2.4 Monitoring against key Baseline Data

Monitoring will also include assessing the economic, social and environmental benefits being generated by the project activities. Table 5.2 provides key baseline data, indicators and monitoring tools to assess the impact of the proposed project activities during the project life. MWDI will have to use the key baseline data and indicators to evaluate the overall project performance.

No.	Baseline Data	Indicators	Monitoring Tools
1	0 percent at the moment since the project has not been rolled out	Percentage of female amongst direct project beneficiaries, of which female	Project reports, Socio-economic surveys
2	52% of the people in the project area live below poverty line	Percentage change of people living below the poverty line in the project area	Through baseline and household surveys, welfare surveys
3	66,000ha under land degradation in the project area	High erosion area (>25/t/ha) in targeted catchment areas	Modelling and Bio-physical survey/monitoring to capture data on changes in agricultural land, forest land and protected areas
4	97 percent of the households within the basin use solid fuel, predominantly fuel wood in rural areas and charcoal in urban centres, for cooking	Percentage decrease of households using solid fuel for cooking	Through household surveys
5	Current ratio is 1 in terms of Selected / Control Catchment Sediment Load averages	Annual average sediment load from selected sub-catchments compared to control catchments reduced	Bio-physical survey/monitoring. The surveys will target monitoring sediment load for high turbidity, and total suspended solids.
6	0 percentage for persons with access to improved flood management in the project area	Percent of persons with access to improved flood management and the proportion of which are female	DoNRDM reports and surveys

Table 5.2: Monitoring of Environmental and Social Safeguards			
No.	Baseline Data	Indicators	Monitoring Tools
7	Vegetation cover in selected catchments	Percentage of vegetation cover change in selected catchments	Through examination of satellite imagery and vegetation index
8	The existing downtime at the hydropower station is 8%	Percent downtime for hydropower stations on the Shire River	Power generation output data compiled by ESCOM
9	15 percent of the households within the targeted sub-catchments are engaged in sustainable land and water management	Percent of households engaged in sustainable land and water management within targeted sub-catchments and the proportion of which are women	Project reports, maps and records from consultations with people in the project areas
10	There are no direct beneficiaries of the project at the moment	Total value of livelihood investment grants managed by targeted GVs	Through socio economic survey, Village Development Committee financial records and SRBMP reports
11	There is 0 percent value of agriculture related products marketed from targeted GVs within the project areas	Percentage increase in total value of agriculture related products marketed from targeted GVs	Through socio economic surveys to gather data on value of marketed products and processed agricultural products
12	Currently the Management Effectiveness Tracking Tool (METT) score is 39	Average Management Effectiveness scores for 6 targeted protected areas/forest reserves	Using METT scores in GEF tracking tools
13	There are no GVs with improved community flood management infrastructure within the project areas	Number of Group Villages with improved community flood management infrastructure	Inspection and site visits to project areas and project reports
14	Value of agriculture related products marketed from targeted GVs	Percentage increase in total value of agriculture related products marketed from targeted GVs	Agricultural marketing reports from the ADDs
15	There is no effective flood warning system in the basin	Average warning time for flood forecast information to reach targeted communities for improved preparedness	Inspection of flood warning reports
16	There are 4 hydro meteorological stations in the Shire River Basin	Number of additional hydro-meteorological stations with accessible data in real time to collect water and climate data established.	Procurement documents and project reports. Physical inspection
17	There are no existing knowledge products (hardcopy/ electronic) and decision support systems/ web based tools developed with appropriate integration of new ecological information for the SRBMP	Progress on Shire River Basin knowledge base and decision support systems development, including ecological aspects	Project reports compiled by technical team for the SRBMP
18	Number of households in targeted areas reclassified to lower risk is 0	Number of households in targeted areas re-classified to lower risk	Project reports or reports from DoNRDM indicating changes in flood risk to communities

6. Source: Shire River Basin Management Project Appraisal Document updated in March 2012 and Draft Environmental and Social Assessment for SRBMP 2012

5.2.3 Monitoring Costs

For project sustainability it is recommended that most of the monitoring activities for the identified impacts should be part of the routine work for government institutions, with financial subventions from recurrent budgets. However, where monitoring cost estimates have been provided in Table 5.3A & 5.3B, they take into consideration of meals, field and subsistence allowances according to government rates and in some cases the costs cover specialized monitoring activities.

5.2.4 Institutional Arrangements for Monitoring

The SRBMP will have the overall responsibility for coordination, planning and implementation of the environmental and social monitoring. The CSC will have the responsibilities of directly monitor the contractors' day to day implementation of the EMP. The key stakeholder institutions included in the EMP will (through their line staff at the districts) monitor their specific areas of expertise and contribute to the preparation of the district monitoring reports. The EDO will coordinate with the staff of the other ministries (e.g. Water Development and Irrigation, Agriculture, Forestry etc.) to prepare a monitoring report to be presented to the DEC through the DPD. Those stakeholders without representation at the district level will carry out their monitoring activities from their head offices and submit their monitoring reports directly to the EAD.

Once endorsed by the DEC, the district monitoring report will be sent to EAD where they will prepare a comprehensive report to include inputs from line ministries not represented at the district level. EAD will thereafter, either present the comprehensive report directly to MSTT or to TCE depending on the complexity of the issues to be addressed. Once endorsed by the MSTT, the report, together with the recommendations and revised EMPs (where required) will be sent to the CSC for his appropriate action through the Contractors.

Table 5.3A & 5.3B, for the Environmental and Social Monitoring Plan, gives the potential environmental and social impacts, mitigation or enhancement measures, proposed monitoring institutions, monitoring indicators, monitoring frequency and the estimated costs for implementing the environmental monitoring plan for the SRBMP in one district for one year. Table 5.4 provides a summary of costs and the total cost of US\$69,000 for the monitoring activities.

Table 5.3A: Generic Environmental and Social Monitoring Plan					
POSITIVE IMPACTS					
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY/ COST (\$/YEAR)
1.0 IMPACTS FROM COMPONENT A: SHIRE RIVER BASIN PLANNING					
1.1	Improved water resources information systems, awareness and knowledge base on SRBMP	Set up and maintain efficient communication channels with full participation of all stakeholders	Number of communication channels set	MWDI	Twice during project planning
1.2	Improved reporting on comprehensive State of the Shire River Basin	Maintain installed information systems such as GSM telemetry and traditional gauging stations in good operating order	Efficient maintenance programme in place	MWDI	Twice during project planning
1.3	Increased institutional capacity for coordinated basin management	Recruit and maintain recommended levels of staffing and adequate resources to be sustained at all times	Number of staff employed and value of assets in place	MWDI	Twice during planning
2.0 IMPACTS FROM COMPONENT B: CATCHMENT MANAGEMENT					
2.1	Reduction in run-off, soil erosion and siltation in the basin	Sustain appropriate soil conservation techniques through regular refresher trainings	Amount silt in Shire River and tributaries	Water Resources Dept.	US\$8,000 Annually during project implementation
		Sustain structures such as check dams through regular maintenance	Number of structures in good operating status	Water Resources Dept.	
		Sustain forestation and rural energy interventions to ensure continued supply of alternative biomass resources and fuel	Percentage increase in vegetative cover in selected catchments	Forestry Dept, Land Resources Conservation Dept	Annually during project implementation
2.2	Increased knowledge of applied research and technology for farming systems intensification and efficient technologies (new brick forming machines, small scale solar energy, fuel efficient stoves, eco-sanitation, etc) to reduce fuel wood demand	Facilitate and disseminate technologies that would be user friendly and acceptable to the communities especially women and children	Percentage of new and technologies adopted by communities	SRBMP EAD Forestry Dept.	Annually during project implementation
		Include the technology user communities during technology planning and design	Number of technology user communities		

Table 5.3A: Generic Environmental and Social Monitoring Plan

POSITIVE IMPACTS

ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY/ COST (\$/YEAR)
2.3	Improved catchment management and protection	Sustain adequate levels of staffing and resources	Number of staff and resources provided	MWDI	Bi-annually during project implementation Training budget included in capacity building
2.4	Improved institutional capacity for catchment planning and monitoring	Conduct regular refresher trainings in catchment and its importance			
2.5	Reduced incidences of flash floods	Sustain forestation and rural energy interventions to ensure continued supply of alternative biomass resources and fuel	Percentage hectare forested	Forestry Dept. EAD	Annually during project implementation \$2000
2.6	Increase in water table through restoration of forest cover	Plant as many trees as possible in all degraded areas and promote regeneration of natural vegetation	Percent area rehabilitated out of the proposed 133,000 ha	Forestry Dept. Land Resources & Conservation Dept	Annually during project implementation Included in 2.5
2.7	Improved consistency in water flows in the Shire River and its tributaries	Maintain and operate the barrage in line with operating procedures	Amount of water flows recorded at Kamuzu Barrage	MWDI	Monthly during project implementation N/A
2.8	Improved participatory micro-catchment planning for communities, government technical staff, field NGOs and relevant private sector actors to develop 28 integrated micro-catchment development plans (MCDPs)	Consult widely to include all stakeholders and adequately involve women and youth as well as disadvantaged groups	Number of MCDPs developed out of the 28; in consultation with all stakeholders	MWDI District Council NGOs CSOs	Quarterly during project implementation \$6000
2.9	Harmonized and quality standard setting in catchment management programs through national guidelines for integrated catchment	Consult stakeholders widely during guideline development.	Number of consultations conducted during guidelines	SRBMP Land Resources & Conservation	Annually during project implementation

Table 5.3A: Generic Environmental and Social Monitoring Plan

POSITIVE IMPACTS

ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY/ COST (\$/YEAR)
	management	Regularly update the guidelines to respond to changing project scope and the environment	updating	Dept.	\$2000
2.10	Improved program performance, transparency and accountability in the program and lesson learning and coordination across the Basin due to developed monitoring model	Support and supervise the monitoring model and systems to ensure that appropriate targets will be met Identify and remove barriers (such as bureaucracy and political interference) from project implementation to ensure that intended monitoring targets are met without impediment	Percentage of performance targets being met	MWDI	Annually during project implementation N/A
2.11	Sustainable and productive agriculture from small scale irrigation, and efficient use of water resources etc.	Train stakeholder communities in sustainable agricultural practices and irrigation water management	Percent of area under sustainable agricultural practices	Irrigation Dept. & Land Resources & Conservation Dept.	Annually during project implementation \$8,000
2.12	Improved management and rehabilitation of degraded forests on customary and communal lands	Train communities in forest rehabilitation and management techniques as well as in sustainable use of forest resources	Number of trainings conducted Number of farmers practicing sustainable agricultural practices and irrigation water management	Forestry Dept. Land Resources & Conservation Dept.	Annually \$2000
2.13	Increased income-generating activities, with special targeting of women, youth and landless groups	Sustain empowerment of women, youth and landless groups through regular trainings and sensitization meetings	Percentage of women and youth benefiting from IGAs	Ministry of Youth Ministry of Gender	Quarterly throughout implementation

Table 5.3A: Generic Environmental and Social Monitoring Plan

POSITIVE IMPACTS

ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY/ COST (\$/YEAR)
				District Council	\$1,000
2.14	Increased revenues from tourism	Sustain catchment protection, flood attenuation, biodiversity conservation and carbon sequestration programmes	Percentage increase in tourism revenues Percent of catchment protection work completed in protected areas	DNP&W, Land Resources & Conservation Dept.	Quarterly during project implementation \$8,000
2.15	Reduced people – park conflicts (park management and animals)	Sensitize communities on the park rules and regulations and enforce them Implement co-management plans for parks	Percent change in people-park conflicts	DNPW	Quarterly during project implementation Included in 2.14
2.16	Improved forest management in Eastern Escarpment, Tsamba & Mangochi Forest Reserves	Sensitize communities in the co-management model and review its strategies and implementation procedures in line with lessons learnt on the ground.	Number of village co-management contracts in place	Forestry Dept.	Bi-annually during project implementation \$2000
2.17	Improved food security, nutrition and household incomes	Promote agricultural diversification with the full participation of smallholder farmers including women, youth and the landless	Percentage of farmers practicing diversification	MAFS, DoI, Ministry of Gender Ministry of Youth	Annually during project implementation
2.18	Decreased dependence on unsustainable exploitation of forest resources	Promote alternative energy sources and support community woodlots	Percentage of communities using alternative energy	Department of Energy Forestry Dept	Bi-annually during project implementation \$2000
2.19	Increase in value of agriculture related products marketed in the targeted GVs by 15 percent	Assist farmers to form cooperative for price bargaining and processing of produce into value added products	Percent increase in marketed value added products in GVs	District Council ADC	Annually during project implementation

Table 5.3A: Generic Environmental and Social Monitoring Plan

POSITIVE IMPACTS					
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY/ COST (\$/YEAR)
					\$3000
2.20	Increase in alternative livelihoods through mobilization, sensitization, and initial capacity building CIG for commercially oriented income-generating activities	Link CIGs to markets for products of income generating activities.	Number of CIGs established out of the 360 CIGs planned for the 480 villages	District Council	Quarterly throughout project implementation Included in 2.19
2.21	Improved sub-catchment level market and access infrastructure	Train community leaders in community mobilization and task distribution to include women and youth during construction of market and access infrastructure	Number of people and women participating in sub-catchment infrastructure works	District Council	Annually during project implementation Included in 2.19
2.22	Increased access to finance through the investment grants to GVs that have reached a certain level of maturity and savings	Design appropriate, transparent and credible mechanisms for determining level of maturity and savings	Number accessing finance in each GV out of the 430,000 households	District Council	Annually during project implementation Included in 2.19
		Provide financial management training	Number of people trained		
2.23	Improved livelihoods from mini and small scale irrigation	Link farmers to markets for produce from irrigation	Percentage increase in farmers linked to produce markets	District Council, MWDI	Annually during project implementation Included in 2.19
3.0 IMPACTS FROM COMPONENT C: WATER RELATED INFRASTRUCTURE					
3.1	Improved sustainable use of water resources in the Shire River and its tributaries	Regular sensitization of communities and water users on water rights and their implications.	Number of sensitizations conducted	Water Resources Board	Annually during project implementation

Table 5.3A: Generic Environmental and Social Monitoring Plan

POSITIVE IMPACTS

ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY/ COST (\$/YEAR)
		Monitor water users to comply with water permits	Number of complaints against water availability	SRBMP	N/A
3.2	Reduced future potential water use conflicts	Regularly sensitize communities on water use rights Monitor water users to comply with water permits			
3.3	Improved energy production from existing hydropower stations	Operate and maintain the barrage according to the recommended operating procedures	Percent downtime for hydropower stations	MWDI ESCOM	Monthly during construction N/A
3.4	Improved water availability for hydropower generation, irrigation, and water supply	Harvest weeds as recommended to facilitate free flow of water to power plants	Water availability to users in the basin	MWDI ESCOM	Monthly during the project life N/A
3.5	Improved road safety and traffic flow at the Kamuzu barrage	Provide adequate appropriate traffic warning signs to alert people on the traffic separation at the gates	Number of accidents	SRBMP RTD	Monthly during construction N/A
3.6	Increased employment opportunities	Recruit workers from within the project site	Number of project beneficiaries employed during upgrading of Kamuzu Barrage	Ministry of Labour MWDI	Quarterly during construction \$2000
3.7	Improved weed management and reduced handling cost	Operate and maintain the boom as recommended	Percent change in unit cost of weed removal	SRBMP ESCOM	Throughout the project N/A

Table 5.3A: Generic Environmental and Social Monitoring Plan

POSITIVE IMPACTS					
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	PROPOSED ENHANCEMENT MEASURES	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY/ COST (\$/YEAR)
3.8	Improved protection of human settlements and infrastructure	Implement integrated Flood Risk Management Plan (IFRMP) to benefit approximately 40,000 households in the flood-prone areas in terms of better preparedness and reduced vulnerability Maintain flood intervention structures regularly and provide early flood warning signs as recommended Sensitise beneficiaries on the need to care for the flood intervention structures	Number of flood control structures established and maintained	DODMA District Council	Annually N/A
3.9	Reduced crop and livestock damage		Number of households re-classified to lower risk of flooding areas	DODMA District Council	Annually during project implementation \$3000
3.10	Reduced economic losses and damage to property			DODMA District Council	
3.11	Improved ecosystem management of the Elephant Marshes	Drafting of legislation for the protection and management of the Elephant Marsh should be finalised to support its protection through maintenance of the buffer capacity	Percentage of land under ecosystem management	DNPW	Before project implementation N/A
3.12	Improved sanitation and hygiene	Sensitise communities on the health impacts associated with flooding	Number of improved sanitary facilities in use	MWDI MoH District Council	Annually throughout operation period \$2000
3.13	Increased employment opportunities during construction of flood intervention structures	Recruit workers from within the project areas	Number of workers recruited from project area	Ministry of Labour	Once annually Covered in 3.6

Table 5.3B: Generic Environmental and Social Monitoring Plan					
NEGATIVE IMPACTS					
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	Proposed CONTROL / MITIGATION MEASURES AND	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY and cost
2.0 IMPACTS FROM COMPONENT B: CATCHMENT MANAGEMENT					
2.1	Restrictions on access to grazing in the protected areas of the catchment	Allocate dedicated areas for grazing	Percentage decrease in open grazing area	District Council SRBMP	Annually Covered in 2.16
2.2	Removal of vegetation during construction of small scale structures and larger infrastructure investments	Restrict vegetation removal only areas for construction	Percent of area cleared of vegetation	District Council SRBMP	Monthly \$2000
		Re-vegetate bare areas after construction	Area re-vegetated	Contractors SRBMP	Covered in 2.2
2.3	Water and soil pollution from agrochemicals and pesticides use	Train communities on safe use, storage and disposal of agrochemicals and pesticides	Water and soil quality around the irrigation schemes	Department of Water Resources, PCB	Quarterly \$4000
	Poisoning and misuse of pesticides		Number of cases		
2.4	Salinization and water logging in irrigation schemes	Train communities in irrigation water management and efficient application of fertilizers	Percentage of land under approved water and irrigation management	Department of Irrigation Department of Water Resources	Annually \$2000
3.0 IMPACTS FROM COMPONENT C: WATER RELATED INFRASTRUCTURE					
3.1	Land acquisition for construction works	Provide adequate compensation to affected persons	Number of complaints arising from compensation process	MLHUD District Council	As specified in RAP \$1000

Table 5.3B: Generic Environmental and Social Monitoring Plan					
NEGATIVE IMPACTS					
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	Proposed CONTROL / MITIGATION MEASURES AND	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY and cost
3.2	Disruptions to aquatic life and the fishing patterns of local communities due to the construction of temporary coffer dams	Provide for minimum flow in the engineering design as recommended by the Water Resources Department	Water flows rates for rivers in the Shire River Basin	Department of Water Resources	Monthly \$3000
3.3	Increased spreading of water related diseases	Design small-scale structures appropriately to avoid water logging and stagnation Cut grass around small earth dams to discourage breeding of mosquitoes	Number of water related diseases Number of malaria cases	MoH SRBMP MWDI	Annually \$2000
3.4	Disturbance to flow of traffic	Limit number of trucks transporting construction materials during peak periods Providing detours and appropriate traffic signs for vehicles and pedestrians	Number of complaints on traffic flow	District Council NRSC	Weekly during construction N/A
3.5	Disturbances in the social structure and organisation	Conduct consultation with the communities and the workers to sensitize them on the importance of respecting the existing social structures and organization.	Number of complaints on social disturbances from the communities	District Council NRSC	Weekly during construction N/A
3.6	Spreading of HIV and AIDS	Include HIV and AIDS mainstreaming at the construction sites	Increase in the spread of HIV and AIDS	SRBMP NAC	Annually US\$2000
3.7	Generation of construction waste (rocks, earth, and other construction materials)	Dispose all rubble and construction wastes at recommended dumping sites	Percent waste disposed in approved places	District Council	Monthly during construction Covered in 3.12
3.8	Dust from construction activities	Spray water on dusty areas on construction sites.	Number of complaints against	Consultant, SRBMP	Daily during construction

Table 5.3B: Generic Environmental and Social Monitoring Plan					
NEGATIVE IMPACTS					
ITEM No.	POTENTIAL ENVIRONMENTAL/ SOCIAL IMPACT	Proposed CONTROL / MITIGATION MEASURES AND	MONITORING INDICATORS	RESPONSIBLE INSTITUTION	FREQUENCY and cost
		Provide dust masks to workers exposed to dust	dust		N/A
3.9	Increased risk to drowning of wildlife particularly those of Liwonde National Park	Provide fencing in all areas that pose risk to wildlife drowning	Percent change in drowning cases	Department of National Parks and Wildlife	Monthly during construction N/A
3.10	Barriers to animal or human access to rivers where steep embankments are constructed or reinforced for flood protection	Provide for gently-sloping river banks at key access points Provide alternative sources of water	Number of access points established on potentially dangerous areas	SRBMP Consultant	Twice annually N/A

Table 5.4 Summary Costs for Environmental and Social Monitoring Plan

Impact enhancement/ Mitigation measure	Cost (US\$)
Sustain structures such as check dams, through regular maintenance	8,000
Facilitate and disseminate technologies that would be user friendly and acceptable to the communities especially women and children Include the technology user communities during technology planning and design	2,000
Sustain forestation and rural energy interventions to ensure continued supply of alternative biomass resources and fuel	2,000
Consult widely to include all stakeholders and adequately involve women and children as well as disadvantaged groups	6,000
Consult stakeholders widely during guideline development. Regularly update the guidelines to respond to changing project scope and the environment	2,000
Train stakeholder communities in sustainable agricultural practices and irrigation water management	8,000
Train communities in forest rehabilitation and management techniques as well as in sustainable use of forest resources	2,000
Sustain empowerment of women, youth and landless groups through regular trainings and sensitization meetings	1,000
Sustain catchment protection, flood attenuation, biodiversity conservation and carbon sequestration programmes	8,000
Sensitize communities in the co-management model and review its strategies and implementation procedures in line with lessons learnt on the ground	2,000
Promote alternative energy sources and support community woodlots	2,000
Assist farmers to form cooperative for price bargaining and processing of produce into value added products	3,000
Recruit workers from within the project site	2,000
Implement integrated Flood Risk Management Plan (IFRMP) to benefit approximately 40,000 households in the flood-prone areas in terms of better preparedness and reduced vulnerability.	3,000
Sensitize beneficiaries on the need to care for the flood intervention structures	2,000
Restrict vegetation removal only areas for construction	2,000
Train communities on safe use, storage and disposal of agrochemicals and pesticides. Develop and implement IPM	4,000
Train communities on irrigation water management and efficient application of fertilizers	2,000
Provide adequate compensation to affected persons	1,000
Provide for minimum flow in the engineering design as recommended by the Water Resources Department	3,000
Design small-scale structures appropriately to avoid water logging and stagnation. Cut grass around small earth dams to discourage breeding of mosquitoes	2,000
Include HIV and AIDS mainstreaming at the construction sites	2,000
TOTAL	69,000

5.3 Environmental and Social Rules for Contractors

The SRBMP will have a number of construction activities for its various project components. The contractors therefore, should make every effort to ensure that the mitigation measures outlined in the Environmental and Social Management Plans and Resettlement Action Plans (if any) are fully implemented and adequately monitored as appropriate.

The contractor shall ensure that the acquisition, transportation and storage of construction/rehabilitation materials; and the disposal of construction/rehabilitation wastes are done in an environmentally and socially friendly manner. Where necessary, the contractor shall seek the advice and assistance of the relevant authority and specialists for handling and disposal of hazardous wastes. SRBMP and implementers of this ESMF should verify that environmental and social rules for contractors—including specific financial or other penalties for non-compliance—will be referenced in all relevant bidding documents and contracts. Annex 7 provides environmental and social rules for contractors to be engaged in SRBMP activities.

CHAPTER SIX: INSTITUTIONAL RESPONSIBILITIES FOR ESMF IMPLEMENTATION

6.1 Definition of Roles and Responsibilities

Successful implementation of the ESMF, EMPs and monitoring plans will require input, expertise and resources from key stakeholders, including the SRBMP participating institutions. It will also require the participation and involvement of the local communities and the Local Leaders. This recommends the activities to be performed by each of the key stakeholders, to successfully implement the ESMF activities and the screening process.

6.1.1 National Level

The Ministry of Water Development and Irrigation (MWDI) through the SRBMP will have the overall responsibility for coordinating and monitoring implementation of the ESMF. SRBMP will work through representatives of key government ministries and stakeholders for SRBMP.

For limited cases where an EIA may be required under the SRBMP, the TCPC (where City or Town Council are involved) or the DEC (for the case of District Council), will inform SRBMP to initiate the preparation of a Project Brief and the Terms of Reference. The SRBMP will then recruit an appropriate Consultant to conduct the EIA study. Once the study is completed, the SRBMP will consult the Director of Environmental Affairs who will be responsible for reviewing the EIA through the Technical Committee on the Environment (TCE).

The Director of Environmental Affairs may arrange for public consultations as part of the EIA process, in order to sensitise the communities and to create awareness. The TCE may require to carry out their own site and works assessment before making the appropriate recommendations to the National Council on the Environment (NCE), through the Director of Environmental Affairs (DEA). The NCE will evaluate the recommendations of the TCE and make appropriate recommendations to the Minister for approval and issuance of the certificate.

6.1.2 District Level

The District Councils, under the general direction of the District Commissioner, will work closely with project staff to take stock of the progress for each project activity in their respective areas of jurisdiction. The Council will hear the views of the communities on the progress, expected benefits and challenges being faced during the implementation period of the projects and the anticipated challenges during time of exit. The District Commissioner will also be the moderator between conflicting views and interests of both the communities on one hand; and the implementing and executing agencies on the other. In addition, all aspects related to resettlement of affected persons, head counts, requirements and property losses shall be heard by the District Commissioner who shall in turn bring up the findings to the appropriate authorities for action.

6.1.3 Area Level

The TCPC and the DEC will be responsible for the technical work at the local level (City/Town and District Council respectively). They will provide the assistance to AEC and DESC in carrying out the screening process and determining whether or not an EIA is required.

The AEC and DESC will be responsible for completing the Environmental and Social Screening Form (Annex 4) to identify the potential environmental and social impacts of the project activities; and to propose the corresponding mitigation measures. The screening process will be under the supervision of the TCPC and DEC, as appropriate. The safeguards specialists at *Water, Waste & Environment Consultants*

national level Technical Team will work closely with the district level teams to ensure that environmental and social concerns are adequately addressed in the review, approval and implementation of sub-projects.

The TCPC or DEC will be responsible for (i) determining the environmental category and the extent of the required environmental work, based on the screening results; (ii) determining the need for EIA and for RAP and (iii) proposing mitigation measures for identified impacts. The TCPC or DEC will also assist SRBMP in drafting the terms of reference for the EIAs and for the identification of an appropriate Consultant to conduct the EIA study. Monitoring of the construction, to ensure that environmental designs are taken into consideration, will be done by the DEC, DESC, EAD, TCPC, Ministry responsible for lands and housing and other sectoral stakeholders. Figure 6.1 provides institutional arrangements for the SRBMP core team of the SRBMP.

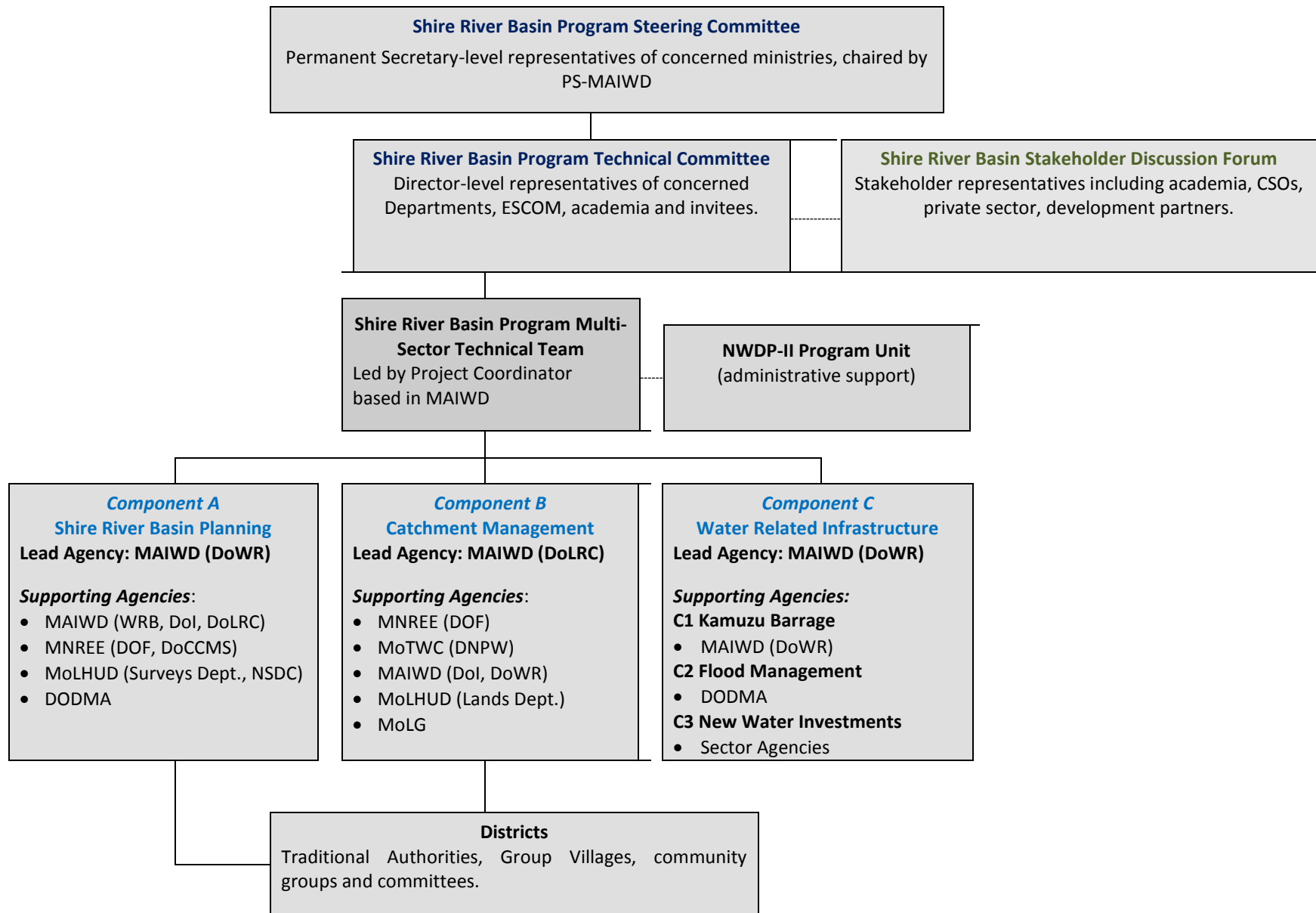


Figure 6.1:Core Team of the SRBMP

CHAPTER SEVEN: CAPACITY BUILDING AND TRAINING

7.1 Training of Trainers and ESMF Implementers

Capacity building and training of trainers will be required for successful implementation of this ESMF. The proposed training interventions will constitute part of capacity development plan under separate cover and they have only been included in this report for convenience.

Training sessions for the trainers are aimed at enhancing the knowledge and understanding to train the District and local level stakeholders in implementation of the ESMF for the SRBMP. Representatives from the District Council/Town Council, City Council, and SRBMP will be trained to train their respective committees and staff in the project impact areas. A total of 24 participants will be trained as follows:

- (a) Twenty members of DEC and TCPC (two from each district) will participate from the DECs of Mangochi, Machinga, Balaka, Blantyre, Zomba, Thyolo, Chikhwawa, Nsanje, Neno, Mwanza districts. One of the two persons will have to be the Environmental Officer (for the city/town) or the Environmental District Officer (for the District)
- (b) Four members comprising two from the MWDI and two from SRBMP will participate. It is recommended that these participants be the ones that are directly involved in the project activities.

Once the trainers are trained, it is recommended that they train (under the supervision of a qualified environmental facilitator) the other groups directly involved in the project implementation. These people will be drawn from the various district committees such as the District Development Committee (DDC), the Area Executive Committees (AEC) and the Village Development Committees (VDC), including the Local Leaders or their representatives.

Hence a total number of 40 persons per district will comprise 12 members of the DDC, 10 from AEC, 15 from VDC and 3 from local NGOs. The DECs will be responsible for selecting the participants from the appropriate project impact DDCs, AECs and VDCs as well as the NGOs.

For the purposes of the training, the project impact areas will be grouped into the following units:

1. Mangochi, Machinga, Balaka (to convene at Liwonde)
2. Blantyre, Zomba, Thyolo (to convene at Blantyre)
3. Chikhwawa, Nsanje (to convene at Bangula)
4. Neno, Mwanza (to convene at Mwanza)

7.2 Proposed Areas of Training

The training activities presented in Table 7.1 are designed for implementing both the ESMF and the RPF and will be for the trainers. At the local level, participants drawn from the DDCs, AECs and VDCs will be trained in the areas outlined in Table 7.2. *Capacity Building Needs Assessment for Implementation of the Shire River Basin Management Programme* is being conducted in order to assess institutional, organizational and individual capacity needs. The training activities outlined in tables 7.1 and 7.2 will therefore be included in preparing a capacity building and training plan for the project.

The training sessions, which should include practical sessions for the use of the Environmental and Social Screening Form (ESSF, Annex 4), are designed to cover aspects of both the ESMF and the RPF. The assumption is that the project implementers and key stakeholders will have to understand both the ESMF and the RPF for efficient management of the environmental and social impacts of the SRBMP. The combined training programme is also designed to reduce training time and expenses.

Table 7.1: Training Programme for Training of Trainers			
Days of Training	Recommended Type of Training (Training Activity)	Target Group / Trainer	Means of Verification
DAY 1	<ul style="list-style-type: none"> • Environmental and Social Impact Assessment • Relevant Environmental Policies and laws in Malawi • World Bank safeguard policies • The Screening Process. • Strategic action planning for Environmental Management • Use of checklists • Preparation of terms of reference. • Identification of Impacts and mitigation measures • EIA report preparation and processing 	SRBMP Management Unit staff MWDI staff District Council staff <u>Trainer: EAD or Private Consultant</u>	20 members of DEC and TCPC trained. 4 members from the Ministry/ SRBMP trained
DAY 2	<ul style="list-style-type: none"> • Watershed Catchment Management • Water resources conservation • Soil conservation • Safe use, storage and disposal of agrochemicals and pesticides • Irrigation water management and efficient application of fertilizers • Agricultural diversification • Park rules and regulations and co-management plans for parks • Alternative energy sources 	SRBMP Management Unit staff MWDI staff District Council staff <u>Trainer: Department of Land Resources, PCB, DNPW, MWDI, MAFS, DOE or Private Consultant</u>	

Table 7.1: Training Programme for Training of Trainers			
Days of Training	Recommended Type of Training (Training Activity)	Target Group / Trainer	Means of Verification
DAY 3	<ul style="list-style-type: none"> • Resettlement and Compensation • Categories of Land in Malawi and • Current valuation of Land and other Physical Assets • Rights to land • Asset valuation • Methods of land acquisition • Compensation Agreements and RAPs 	SRBMP Management Unit staff MWDI staff District Council staff <u>Trainer: Lands Department or Private Consultant</u>	
DAY 4	<ul style="list-style-type: none"> • Public Consultation • Flow of communication on land-related issues • Awareness campaign programme • Record Keeping 	SRBMP Management Unit staff MWDI staff District Council staff <u>Trainer: Private Consultant</u>	
DAY 5	<ul style="list-style-type: none"> • HIV/AIDS and Project Implementation. • Impacts of HIV/AIDS on social well-being, livelihood and projects • Mitigation measures • Training Evaluation And Wrap Up 	SRBMP Management Unit staff MWDI staff District Council staff <u>Trainer: NAC or Private Consultant</u>	

Table 7.2: Training Programme for members of DDC, AEC and VDC			
Days of Training	Recommended Type of Training (Training Activity)	Target Group / Trainer	Means of Verification
DAY 1	<ul style="list-style-type: none"> • Environmental and Social Impact Assessment • Relevant Environmental Policies and Laws in Malawi • World Bank safeguard policies • The Screening Process. • Planning for Environmental Management • Use of checklists • Identification of Impacts and mitigation measures 	<p>Members of DDC, AEC, VDC and Local Leaders, NGOs</p> <p><u>Trainer: EAD or Private Consultant</u></p>	<p>12 members of DDC trained.</p> <p>10 members of AEC trained</p> <p>15 of VDC Trained</p> <p>3 NGOs</p>
DAY 2	<ul style="list-style-type: none"> • Watershed Catchment Management • Water resources conservation • Soil conservation • Safe use, storage and disposal of agrochemicals and pesticides • Irrigation water management and efficient application of fertilizers • Agricultural diversification • Park rules and regulations and co-management plans for parks • Alternative energy sources 	<p>Members of DDC, AEC, VDC and Local Leaders, NGOs</p> <p><u>Trainer: Department of Land Resources, PCB, DNPW, MWDI, MAFS, DOE or Private Consultant</u></p>	
DAY 3	<ul style="list-style-type: none"> • Resettlement and Compensation • Categories of Land in Malawi • Current valuation of Land and other Physical Assets • Rights to land • Asset valuation • Methods of land acquisition • Compensation Agreements 	<p>Members of DDC, AEC, VDC and Local Leaders, NGOs</p> <p><u>Trainer: Lands Department or Private Consultant</u></p>	

Table 7.2: Training Programme for members of DDC, AEC and VDC			
Days of Training	Recommended Type of Training (Training Activity)	Target Group / Trainer	Means of Verification
DAY 4	<ul style="list-style-type: none"> • Public Consultation • Flow of communication on land related issues • Awareness campaign programmes • Record Keeping • HIV/AIDS and Project Implementation. • Impacts of HIV/AIDS on social wellbeing, livelihood and projects • Mitigation measures • Training Evaluation And Rap Up 	<p>Members of DDC, AEC, VDC and Local Leaders, NGOs</p> <p><u>Trainer: Private Consultant</u></p> <p>Members of DDC, AEC, VDC and Local Leaders, NGOs</p> <p><u>Trainer: NAC or Private Consultant</u></p>	

7.3 Training Budget

24 participants will be trained as trainers in both ESMF and RPF implementation, in the areas presented in Table 7.1. The cost of this training, which is proposed to take place at the central point (Blantyre), will be \$31,975.00. The estimated costs cover travel expenses from the different project impact districts to Blantyre and back. Other expenses are for accommodation, hire of training room and facilities, meals and per diems for the participants. The budget is also based on the following:

- Prevailing costs of goods and services offered in the central point (Blantyre);
- Training period of 5 days;
- Hiring of 5 trainers, each handling one area of training as proposed in Table 7.1;
- Subsistence allowances estimated at US\$30.00 per participant per day and;
- A lump sum of US\$10,000.00 to cover the costs of the trainers and training materials.

Table 7.3 provides details of the budgetary requirements for the training of trainers. The same training programme has been provided in the RPF for clarity of presentation. It is to be understood as a combined training programme to cater for the needs of both the ESMF and the RPF.

Table 7.3: Summary of Costs for Training of Trainers in Blantyre					
Summary of Costs for Training of Trainers in Blantyre					
Description	Unit	Qty	Rate	Cost for	TOTAL
			USD	5 days	USD
SUBSISTENCE ALLOWANCES					
Participants for 5 days	Persons days	100	30	3,000.00	
Trainers for 5 days	Persons days	25	30	750.00	
Support Staff for 5 days	Persons days	10	30	300.00	
Drivers	Persons days	10	30	300.00	4,350.00
		145			
MEALS AND REFRESHMENTS					
Lunches	No	145	9	1,305.00	
Teas (10 tea breaks)	No	290	4	1,160.00	2,465.00
ACCOMMODATION					
Participants	Person nights	100	100	10,000.00	
Support Staff for 5 days	Person nights	10	100	1,000.00	11,000.00
TRANSPORT	Sum				1,285.79
WORKSHOP STATIONERY					1074.00
PA SYSTEM	Sum		180	900.00	900.00
CONFERENCE HALL	Sum		180	900.00	900.00
TRAINERS					10,000.00
GRAND TOTAL					31,975.00

At the local level, the 40 participants will be trained at an estimated cost of \$14,980.00 per district. This training programme will also combine ESMF and RPF training needs and should include practical sessions in the completion of the screening form and the check list. Table 7.4 has the breakdown of the training budget.

Table 7.4 Costs for Four Days Training for Members of the DDC, AEC and VDC					
DESCRIPTION	UNIT	No. of PERSONS	RATE	COST FOR 4 DAYS	TOTAL
SUBSISTENCE ALLOWANCES					
40 Participants for 4 days		40	30	4,800.00	
Support Staff		2	30	240.00	
Drivers		3	30	360.00	5,400.00
		45			
MEALS AND REFRESHMENTS					
Lunches	No	45	9	1,620.00	
Teas	No	90	4	1,440.00	3,060.00
ACCOMODATION (Participants)					
		42	40	6,720.00	
TRANSPORT COSTS (Fuel)					
	Cars	3	250	5,250.00	3,000.00
WORKSHOP STATIONERY					
	Sum	10	72	720.00	720.00
CONFERENCE HALL					
			100	400.00	400.00
TRAINERS FEES					
		1	100	400.00	400.00
FACILITATOR (Consultant Fees)					
		1	300	2,000.00	2,000.00
TOTAL TRAINING ONE GROUP					14,980.00
TOTAL FOR TRAINING FOUR GROUPS					59,920.00

7.4 Potential Challenges in Training

The challenges, as noted from experience with trainings conducted for similar trainings include the following:

- Although the Project Implementation Manual and this ESMF give guidelines as to which topics should be presented, trainers have faced difficulties because of rushing into the training activities before isolating issues pertaining to the target audiences. It is important therefore to ensure that there is adequate time to prepare for the trainings.
- In some cases, it has been observed that training of frontline staff and communities delayed due to the fact that staff (trainers) lacked confidence to undertake the trainings. This can be corrected by ensuring that a supervisory team or a Consultant is available at the beginning of the trainings especially during the first sessions on screening of the project activities and sites.

CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS

This Environmental and Social Management Framework has been prepared to guide the assessment of the environmental and social impacts of the SRBMP activities and to assist project implementers and other stakeholders to mitigate potential environmental and social impacts of the project.

The ESMF has identified the following key generic positive environmental impacts from the proposed project activities:

- Improved reporting on comprehensive State of the Shire River Basin;
- Improved information systems and knowledge base on Shire River Basin Management Project;
- Reduction in run-off, soil erosion and siltation in the Shire River basin;
- Increased institutional capacity for coordinated management of Shire River Basin;
- Improved sustainable use of water resources in the Shire River Basin;
- Improved catchment management and protection;
- Improved protection of human settlements and infrastructure through a limited set of adaptation measures including flood zone demarcation;
- Sustainable and productive agriculture from small scale irrigation and efficient use of water resources;
- Improved income generation at household level within the basin;
- Improved power generation at hydro power stations on the Shire River Basin;
- Improved forest management in Eastern Escarpment, Tsamba and Mangochi Forest Reserve;
- Improved livelihoods through enhanced food security, nutrition and availability of disposable income;
- Decreased dependence on unsustainable exploitation of forest resources; and
- Improved water availability for hydropower generation, irrigation activities and water supply.

The key generic negative environmental and social impacts of the project activities, in the absence of adequate mitigation, measures could include:

- Land acquisition on both banks of the Shire River and in areas where people need to relocate to make room for new construction works;
- Disruptions to aquatic life and the fishing patterns of local communities due to the construction of temporary coffer dams during to upgrading of the Kamuzu Barrage;
- Changes in water flows and levels during the upgrading of Kamuzu Barrage (addressed in a separate Environmental and Social Impact Assessment); and
- Water pollution from uncontrolled agro-chemical use and pesticides use.

During the assessment, it was determined that the negative impacts will be localised, site specific and easy to manage; and generic provisions for mitigating the identified negative impacts have included made in EMP.

In implementing the ESMF it should be noted that there will be different sources of social and environmental impacts arising from existing and new project activities, apart from SRBMP project activities. It is also to be appreciated that the project sites and activities are dynamic and will respond to natural and induced changes to the environment. Both activities for other projects and natural activities may impact on the project implementation and environmental aspects of the SRBMP. It is expected therefore that the other existing and new project activities will have their own

environmental and social management plans. In the same way it is hoped that the Environmental Affairs Department and other relevant line ministries will ensure that human and naturally induced activities that lead to environmental problems are properly managed and monitored.

Capacity building and training will be required on the screening process for project activities and sites in order to identify potential impacts of the project and determine appropriate environmental and social category of the project leading to identification of impacts. Key stakeholders to be trained should include district and local level stakeholders. These will be critical for implementation of the ESMF for the SRBMP. A separate document for capacity building and training activities, including for environmental activities, has been prepared for the SRBMP.

Successful implementation of the ESMF will depend to a large extent on the involvement and participation of local communities and the local institutions. It is therefore recommended that these stakeholders should be involved in the implementation of the project and the ESMF. The stakeholders should adopt and adapt the screening process, checklists and the EMP to suit local conditions. It is further recommended that:

- Using the Screening Form, EMPs should be prepared for the each project activity with potentially significant adverse environmental impacts, to ensure that negative impacts are properly mitigated and that positive impacts are enhanced;
- Environmental awareness and education for the key stakeholders and affected communities should be an integral part of ESMF implementation;
- City/Town/District and local community structures should be adequately trained to implement the screening process and to develop and implement appropriate Environmental Management and Monitoring Plans;
- The environmental and social management and monitoring plans, prepared on the basis of the ESMF, should be regularly updated to respond to changing local conditions and should incorporate lessons learned from implementing various components of the project activities;
- The City/Town/District Councils should be assisted to develop appropriate information management systems to support the environmental management process;
- The Councils should be assisted with the necessary resources to be able to produce the screening documentation such as checklists and environmental management and monitoring forms; and
- The Environmental District Officer should be empowered to adequately administer the ESMF and should be given the necessary support and resources to ensure effective implementation.

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ANNEXES

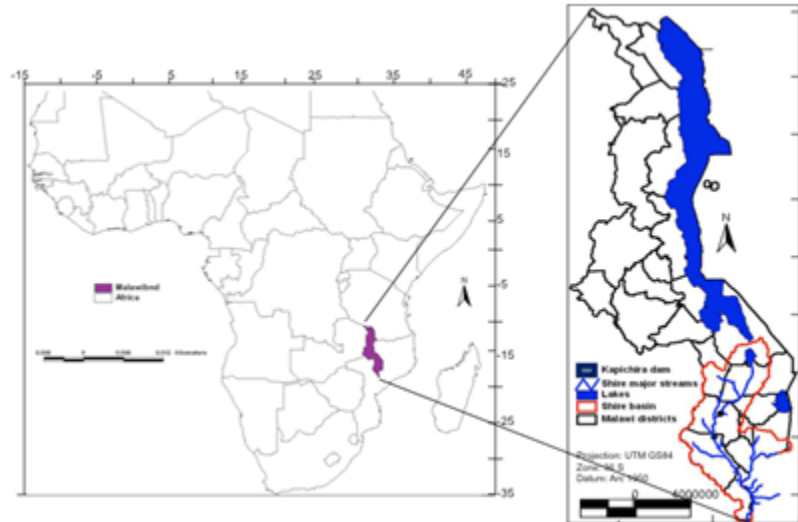
Annex 1. Terms of Reference Malawi Shire River Basin Management Project

Terms of Reference for an Environmental and Social Assessment

Introduction and Project Context

1. The Government of Malawi has received a Project Preparation Advance on the proceeds of a credit from the International Development Agency (IDA – World Bank Group) to finance the preparation of the Shire River Basin Development Project. The World Bank is assisting the Government of Malawi in the preparation of a Shire River Basin Management Project as part of a longer term Program. The program is a flagship World Bank financed activity for Malawi given the importance of the Shire River Basin for economic growth and poverty alleviation.
2. The overall Program Development Objective is to make significant progress in achieving socially, environmentally and economically sustainable development in the Shire River Basin. The project development objective of the Shire River Basin Management Program would be to develop a strategic planning and development framework for the entire Shire River Basin (defined from outflow of the lake to the border at Nsanje) and support targeted investments to improve land and water resources management and livelihoods in the Basin.
3. The Program investments will be designed to support the GoM's economic growth and sustainable development plans for the basin. The Program will address the interlinked challenges of poverty and a deteriorating natural resource base in the Shire River Basin to halt the process of environmental degradation and improve the productive potential of natural resources. The Program will promote integrated climate resilient investment planning in the basin, including institutional capacity building to plan and monitor changes in land use patterns at a basin level. The first project in the Program will support strategic planning and implementation of large-scale infrastructure investments; adoption of sustainable land, forest and water management practices to reduce land degradation in production landscapes and improve the productivity and incomes of smallholder farmers in priority catchments; and improved flood management in the Lower Shire. The first Project is expected to involve a World Bank investment of about US\$ 100m and be implemented over five and a half years. The Project is organized in three components (of about equal costs) as described below:

Component A: Shire River Basin Planning intends to *lay the foundation for more integrated investment planning and system operations for the Shire River Basin*. It would finance development of a modern integrated Shire River Basin knowledge base and analytical tools, as well as well-planned structured stakeholder consultation processes, in order to facilitate investment and systems operation planning. This component is critically required to move



from the current fragmented approach to investments and systems operation, to a more coordinated and holistic approach based on a shared (but evolving) vision for the development and management of the Shire River Basin. It will support institutional coordination mechanisms for basin planning and management for the basin's socio-economic development and environmental sustainability. It is organized in four sub-components:

- **Sub-component A.1: Develop a Shire River Basin Plan**, through (i) preparing an inter-sectoral Shire River Basin Plan, including basin planning and decision support systems, acquiring datasets (satellite imagery etc.), and training for water resources planning and management; and (ii) strengthening an inter-sectoral Shire River Basin coordination and management institution.
- **Sub-component A.2: Build institutional capacity for coordinated basin management**, will strengthen the different line agencies involved in Shire River Basin management to more effectively play their different roles, in particular: (i) Ministry of Irrigation and Water Development (in particular, the Department of Water Resources, Department of Irrigation, and the Water Resources Board); (ii) Ministry of Agriculture and Food Security (Department of Land Resources Conservation); (iii) Ministry of Natural Resources, Environment and Energy (Department of Forestry, Department of Climate Change and Meteorological Services); (iv) Ministry of Lands, Housing and Urban Development (particularly Department of Surveys and the National Spatial Data Centre); and (v) Department of Disaster Management Affairs (DODMA).
- **Sub-component A.3: Improve water resources information systems**, focused on: (i) water resources information system, to monitor water flows and discharges, water quality and sediment loads, as well as groundwater, using real time low-cost modern communications such as GSM telemetry, complete with operational control systems; and (ii) Flood Early Warning Systems, including hydrological/hydraulic flood modelling and forecasting, as well as community level early warning systems. These information systems would also be used to refine and update the Integrated Flood Risk Management Plan for the Shire River Basin being prepared by DODMA with Bank/GFDRR support.
- **Sub-component A.4: Program management, monitoring and evaluation**, to ensure efficient and timely delivery of project resources in accordance with the project's objectives. A multi-sector Technical Team has been formed and located in MoIWD, led by a Project Coordinator who reports directly to the Permanent Secretary (PS). The project will provide funding for professional and support staff to strengthen the Technical Team (initially facilitated by the National Water Development Program PMU) and facilitate its operations, including procurement, financial management, environmental and social safeguards specialists, an institutions specialist, GIS and modelling experts, economist and water resources planner, as well as a diverse range of short term expertise and annual external audits, as well as training and communications. M&E support will be provided for baseline, 6-monthly, mid-term, and end-of-project reporting.

Component B: Catchment Management intends to *rehabilitate degraded catchments for sustainable natural resource management and livelihoods through an integrated, participatory approach*. Development of community-based natural resource management systems is a long-term process that requires sufficient time to build the necessary capacity and ownership and is suitable for the programmatic approach proposed for the project. There would be three stages at the local micro-catchment level: (i) building conditions for micro-catchment rehabilitation and alternative livelihood development, including community sensitization, social mobilization and capacity building to ensure ownership and a strong foundation for subsequent interventions; (ii) implementation of micro-catchment development plans and alternative rural livelihoods; (iii) continuing financial and technical

support for catchment rehabilitation and livelihood activities and longer-term community support.

- **Sub-component B.1: Build institutional capacity for sub-catchment planning and monitoring** with five sets of activities: (i) strategic planning and facilitation (including development of a comprehensive Monitoring & Evaluation System, guidance documents/field manuals, etc.); (ii) participatory micro-catchment planning at the Group Village level to develop integrated plans covering approximately 3,000 hectares each; and (iii) implementation support to provide technical service to government and communities at the national and field level.
- **Sub-component B.2: Rehabilitate targeted sub-catchments**, would finance interventions identified in micro-catchment plans prepared under sub-component B.1, including: (i) soil and water conservation for more sustainable and productive agriculture; (ii) forestry and rural energy interventions to restore forest cover and reduce firewood consumption within the sub-catchments; (iii) water regulation control to support community infrastructure; (iv) small-scale/mini irrigation facilities to assist farmers in drawing water from small storage structures to support agriculture/agri-business; and (v) appropriate rural infrastructure in each sub-catchment based on initial strategic assessments.
- **Sub-component B.3: Support alternative rural livelihoods** would support demand and market driven income-generating activities, with special targeting of women, youth and landless groups, to gradually decrease dependency on forest products as sources of income. This includes: (i) development and start-up of alternative livelihoods to support identification, mobilization, sensitization, and initial capacity building of common interest groups (CIG) for commercially oriented income-generating activities; (ii) capacity building and mentoring to build organizational, technical, financial and business capacities, and linkages with the private sector; and (iii) improving access to rural finance through community small-grants and linkages with existing credit schemes.

Component C: Water Related Infrastructure intends to *mitigate risks posed by droughts and floods and to prepare priority water investments*. The component would build on the basin planning carried out under Component A, and also on ongoing strategic water resources planning by the MoIWD. The component is organized in three sub-components:

- **Sub-component C.1: Kamuzu Barrage** would support the construction and construction supervision of the Kamuzu Barrage upgrade at Liwonde (to improve control of Lake Malawi water level), coupled with optimization and implementation of a new operational regime for the barrage. This central piece of water resources infrastructure for Malawi is currently being finalized with a detailed design and independent Environmental Impact Assessment under the Second National Water Development Project II implemented by MoIWD.
- **Sub-component C.2: Flood Management** in the Lower Shire in collaboration with other initiatives, to support the implementation of the Integrated Flood Risk Management Plan for the Lower Shire (see Component A): (i) community level adaptation support to the design and construction of adaptation measures, such as flood demarcation, elevated platforms, shelters and safe havens; communication and transport equipment for Civil Protection Committees, and connectivity to the Flood Early Warning Systems; and (ii) priority flood mitigation interventions, such as river bank stabilization, dykes, culverts, flood diversion structures etc.
- **Sub-component C.3: Preparation of New Water Investments** within the Shire River Basin would include feasibility and design studies for additional water related infrastructure works. There is ample scope and need to further develop the Basin's resources for different economic sectors, such as: agriculture in general and irrigation agriculture in particular, aquaculture, urban and rural water supply, hydropower, transport and disaster resilience.

Special attention could be given to the design of a set of measures for flood mitigation in the Ruo River, the notoriously forceful flooding tributary to the Lower Shire.

Environmental and Social Context

4. **Existing Environmental and Social Problems:** The Shire River basin is currently facing a number of environmental and social problems induced by human factors. Major ones include conversion of catchments to other land uses, deforestation, soil erosion, proliferation of weeds and invasive species, declining capacity for agricultural productivity, expansion of settlements, declining incomes and livelihoods and others.
5. **Expected Environmental Impacts:** The project is being designed with environmental sustainability in mind for all components and activities. The environmental impacts of watershed management (Component B) are expected to be highly positive overall; likely environmental benefits include improved forest conservation and restoration, reduced soil erosion and land degradation, reduced sedimentation in the Shire River and some of its tributaries, and a reduced risk that the Shire River would run dry during an extended drought. Environmental considerations will be given major attention in Shire River Basin planning, as well as major civil works, to ensure that any adverse environmental impacts are minimized and adequately mitigated.
6. **Social Development Issues:** The project design will reflect social safeguards and sustainability. Preparatory activities will include consideration of these issues as part of an Environmental and Social Assessment and Management Framework and a Resettlement Policy Framework. Stakeholder involvement is proposed throughout the project and the preparation will support studies for stakeholder identification at various levels. This will build on work by various CSOs/NGOs especially related to catchment management and related livelihood enhancement and capacity-building activities.
7. **Environmental and Social Safeguards Reports.** The following World Bank Safeguard Policies apply to this project: Environmental Assessment OP 4.01, Natural Habitats OP 4.04 and Forests OP 4.36, Pest Management OP 4.09, Physical Cultural Resources OP 4.11, Involuntary Resettlement OP 4.12, Safety of Dams OP 4.37, and International Waterways OP 7.50. To ensure that the project is designed so as to comply fully with these policies, the following safeguards-related instruments will be developed during project preparation. Each of these reports will need to be completed (at least as good-quality drafts) and publicly disclosed in advance of project appraisal and (except for the Riparian Notification Letter) at least 120 days before formal project approval by the World Bank's Board of Executive Directors.
 - a) A **Strategic Environmental and Social Assessment (SESA) of the Shire River Basin** is substantially complete, with a Second Draft provided in August 2010 and now under review. The SESA is intended to assess the environmental, social, economic, and institutional implications of development policies, plans, and programs for the Shire River Basin.
 - b) An **Independent Environmental Impact Assessment (EIA) of the Kamuzu Barrage Upgrading** (including a social assessment and Resettlement Plan) is currently in the procurement process, with agreed terms of reference. An Independent EIA is sought, bearing in mind that a preliminary EIA was completed in 2003 as part of the Feasibility Study (*The Integrated Water Resources Development Plan for Lake Malawi and Shire River System "Lake Malawi Level Control"—Stage 2, Final Feasibility Report, Volume II, Part C—EIA of Upgraded Liwonde Barrage, Norconsult*).
 - c) An **Environmental and Social Assessment (ESA) of the Shire River Basin Management Project** will provide an overview of the expected environmental and social impacts of the overall project. The ESA will include an Environmental and Social Management

Framework (ESMF), indicating the corresponding mitigation and enhancement measures for each type of environmental and social impact identified (whether negative or positive). This ESA will serve as a companion volume to the Independent EIA of the Kamuzu Barrage Upgrading (part of Component C).

- d) A **Resettlement Policy Framework** for the overall project will (i) incorporate the Resettlement Plan that will be produced under the Independent EIA of the Kamuzu Barrage Upgrading and (ii) specify the criteria and procedures to be followed if other components of the project (besides the Kamuzu Barrage work) would lead to involuntary physical relocation, or the loss of assets or livelihoods, among people in the project area.
- e) Given that the Shire is part of the Zambezi basin and given the nature of activities proposed under the project, there is a need to send a **Riparian Notification Letter** to the governments of all the other Zambezi River Basin countries (Mozambique, Tanzania, Angola, Botswana, Namibia, Zambia, and Zimbabwe). The mission advised the Department of Finance on the requirement for such a routine notification and request for official comments as per the Bank operational policy on Projects in International Waterways. It was also noted that the Bank could undertake such a notification as in the case of the earlier National Water Development Project.

Objective of This Study

8. The objective of this study is to undertake an Environmental and Social Assessment (ESA) of the Shire River Basin Management Project. This assessment would analyze the environmental and social implications of the proposed project activities (with the exception of the Kamuzu Barrage upgrading that is being handled by a separate study) and develop an Environmental and Social Management Framework for project activities. The ESA is intended to help prevent, minimize, or mitigate any adverse environmental and social impacts, while enhancing the positive impacts of the project. A Resettlement Policy Framework will also be prepared to guide the compensation and resettlement process of any activities that might lead to displacement of people. An analysis of project activities would be undertaken to examine these aspects and this would also draw upon other studies and the existing experience from implementation of similar activities through relevant government and NGO/CSO programs.

Study Scope

9. The following paragraphs are intended to define the scope of the ESA:

- **ESA to include ESMF and RPF.** In addition to the diagnostic sections describing the existing situation and potential environmental and social impacts (positive or negative) of proposed project activities, the ESA report should include (as a chapter or concise separate volume) an Environmental and Social Management Framework (ESMF). The ESMF would essentially function as an Environmental Management Plan (EMP), but is called an ESMF (i) to allow for adaptive changes in specific project interventions (especially under Component B) and (ii) to explicitly acknowledge the social aspects. The ESMF should outline mitigation and enhancement measures for all components, including from the Kamuzu Barrage Independent EIA. The ESMF should be written in a concise, operational style, so that (following negotiations between Government and the World Bank) it can serve as a legally binding document referenced in the project's Financing Agreement. In addition to recommending specific actions for mitigating the potential adverse environmental or social impacts—and enhancing the positive impacts—the ESMF should include (i) an implementation schedule (in sync with other project activities); (ii) institutional responsibilities for implementation; (iii) a budget for investment and recurrent costs; and (iv) suggested source(s) of funding for the recurrent costs.

The ESA would also include a comprehensive social assessment related to the project area and activities and undertake stakeholder identification and consultations in this regard. Areas of environmental and social capacity building and a framework for monitoring and evaluation would be developed. A Resettlement Policy Framework (RPF) would also be developed for the

project as some of the project activities could involve some involuntary resettlement. Findings of the Strategic Environmental and Social Assessment will likely have direct and indirect influence on the outcomes of the ESA. The consultant should therefore critically analyze the findings and recommendations of the SESA and integrate them in relevant section of the ESA as part of the impact mitigation and enhancement process.

- **Basic Content of ESA, ESMF, and RPF.** The ESA report should provide the types of information—where specifically relevant to this project—indicated in OP 4.01, Annex B, “Content of an Environmental Assessment Report for a Category A Project”. In the case of environmental and social impacts related to the Kamuzu Barrage upgrading, the ESA should briefly summarize the key findings of the Independent EIA, which will serve as a companion volume to the ESA report. Similarly, the ESMF report should outline the types of activities—where relevant to this project—indicated in OP 4.01, Annex C, “Environmental Management Plan”. The work should also build on good practice examples in existing projects in Malawi and similar projects elsewhere. The work of the Millennium Challenge Corporation (MCA in Malawi) on environmental and social aspects should be particularly useful in this regard. Other triggered policies should be analyzed, investigated and reported in specific chapters of the ESA and mitigation measures should be part of the ESMF.

Consistency with World Bank Safeguard Policies and Malawian Legal Requirements The consultant should ensure that the preparation of the ESA, ESMF and RPF is consistent with the World Bank Environmental and Social Safeguard Policies. A total of eight safeguards are triggered by this project and therefore due consideration must be given towards the requirements for each of these policies ensuring that their conditions are met. The ESA, ESMF and RPF will also have to be consistent with the provisions of the Environment Management Act (EMA), 1996 and the requirements of the Malawi Environmental Impact Assessment Guidelines (1997). Section 24 of the EMA specifies the types and sizes of projects that require an environmental impact assessment (EIA) before they can be implemented. A prescribed list of projects (Gazetted under the EMA, 1996) for which EIA is mandatory is provided in the Malawi Environmental Impact Assessment Guidelines, 1997. The Act further outlines the EIA process to be followed in Malawi; and requires that all project developers in both the public and private sectors comply with the process. The Act under section 26 (3) further requires that no licensing authority issue any license for a project for which an EIA is mandatory unless the Director of Environmental Affairs (DEA) has given consent in writing; on the basis of a satisfactory EIA or non-requirement of an EIA. In light of these requirements, Kamuzu Barrage Upgrading will require a separate Independent EIA to provide specific information needed for approval by the Environmental Affairs Department (EAD). For the multiple, small-scale civil works expected under Component B, the ESA should attempt to include whatever environmental information is required by EAD. To the maximum extent feasible, the proposed civil works in each sub-catchment—when precisely defined—should be submitted to EAD as a single package to minimize transaction costs. The basic information that first needs to be submitted to EAD is a Project Brief; based on the content of this document, EAD determines whether the project (or any component thereof) requires (i) a full Environmental Impact Assessment; (ii) only an Environmental Management Plan; or (iii) no further action. Further details are in the Government’s *Guidelines for Environmental Impact Assessment* (1997), along with more recent, sector-specific guidelines related to water development (available from EAD).

Key Tasks

10. The Consultant will undertake the following tasks as part of this assignment:

- Task 1. Understand the Project Area and Activities:** Discuss scope of project activities with Client, related agencies, and the World Bank to better understand the types of investments, especially physical interventions that are envisaged as part of the project. Also examine

spatial and other information available for the proposed project intervention locations for each activity to understand the social and environmental setting and determine potential impact areas of concern for each type of activity. Undertake field visits (including to potential project activity areas such as the Middle Shire for watershed management activities) and stakeholder consultations in this regard.

Task 2. Analyze alternative project planning scenarios and approaches:

Examine different project scenarios and implementation approaches and determine the best alternatives in order to secure benefits, minimize negative impacts and reduce overall project costs. Alternatives may be analyzed both at project and component level depending on the available options.

Task 3. Analyze Environmental and Social Implications of Proposed Project Activities:

Determine the environmental and social implications of the proposed project activities. These will include implications on natural habitats and biodiversity, water quality, public health, dam safety (for check dams), resettlement and economic rehabilitation (e.g. related to any land acquisition), invasive species, etc. The ESA would also assess any riparian implications of project activities as per the World Bank Safeguard Policy OP 7.50 Projects on International Waterways. Positive implications of the project should also be analyzed where possible.

Task 4. Develop an Environmental and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF) for the Project: This will include measures by each kind of activity to maximize the environmental and social benefits of the activities, as well as minimize and mitigate any adverse impacts. In particular, attention will be paid to the following aspects:

- **Water Release Operating Rules.** The ESMF should describe how interim and longer-term water release operating rules from dams and barrages in the Shire River Basin would seek to optimize between different water-dependent objectives, including hydropower generation, drinking water supply, irrigation, ports and river transport, and environmental flows. (For the Kamuzu Barrage, this information should become available from the forthcoming Independent EIA.) **Environmental flows** considerations can include (i) simulating natural seasonal variation in river flows (within defined limits) to promote successful fish reproduction, riverine forest regeneration, flood-recession agriculture, dry-season river sandbar habitat for rare birds, etc.; (ii) maintaining minimum dry-season flows (a major objective of the Kamuzu Barrage, since historically the Shire River has occasionally run dry); (iii) avoiding strong daily fluctuations in the flow of larger rivers (resulting from uncompensated peaking power water releases); and (iv) avoiding sudden major drops in river flows (to prevent fish stranding).
- **Impacts on Natural Habitats and Biodiversity.** The project (Component B) is expected to affect natural forests in a positive manner by promoting their conservation and sustainable use within selected sub-catchments of the Shire River Basin; to the extent feasible, the ESA should identify the main forest areas within each sub-catchment that would likely benefit from Component B activities. The ESA should also identify any potential adverse impacts on natural habitats or species of conservation concern, from project-supported civil works or changes in water releases from hydraulic infrastructure. In the case of the Kamuzu Barrage upgrading, the ESA report should summarize (from the detailed Independent EIA) the impacts of an expected increase in flooding within the upstream Liwonde National Park, in terms of changes in floodplain vegetation as well as damage to park trails and other infrastructure. The ESMF should specify compensatory mitigation measures for any significant damage to protected areas and other natural habitats, consistent with the requirements of World Bank policies (Natural Habitats OP 4.04 and Forests OP 4.36) as well as Malawian law. The ESMF should indicate the types of biodiversity-related monitoring that the project would support, such as of how

endemic fish species in Lake Malawi respond to the modest increase in average lake levels resulting from the Kamuzu Barrage upgrading. The ESMF should also provide guidance (such as that in Chapter 9, pages 311-312 of the World Bank's 2008 *Forests Sourcebook*) for how any project-supported planning studies (such as the Shire River Basin Flood and Drought Management Master Plan, or pre-investment studies of proposed new water infrastructure) or information systems (such as the Shire River Basin Atlas) would include key information on existing and proposed protected areas and other sites of high conservation value (known as Critical Natural Habitats in OP 4.04).

- **Invasive Species and Weed Proliferation.** The ESA should indicate if any project activities (particularly under Component 2) could lead to proliferation of weeds and spread of alien invasive species. The ESA should also examine the impact of weeds and invasive species on broader economic activities along the Shire River including the water treatment and hydro-power generation, agriculture, transport systems and facilities, water abstraction, settlements and other activities. The ESMF should specify any needed mitigation measures (such as prohibitions on stocking of non-native fish).
- **Pest Management.** Since Component B is likely to involve investments in improved agricultural practices, some project-supported activities might trigger the Bank's Pest Management OP 4.09—specifically, if the project would (i) procure pesticides or pesticide application equipment (whether with Bank-provided or counterpart funds) or (ii) maintain or expand pest management practices that are risky from an environmental or human health standpoint. The ESMF should indicate—as needed—the means by which (i) any project-supported pesticide procurement would solicit the Bank's prior no-objection; (ii) the project would promote the safe storage, handling, and disposal of pesticides; and (iii) the project would promote integrated pest management (IPM) wherever feasible. Some of the alternative livelihoods development (Component B) might involve market development and other promotion of organic crops, produced without the use of synthetic compounds.
- **Cumulative Environmental Impacts.** The ESA should address whether, under Component 2, certain types of small-scale civil works could have specific, cumulative adverse environmental impacts, even though (i) their individual adverse environmental impact is too small to be considered significant and (ii) their overall cumulative environmental impact might well be highly positive. As an example, numerous small-scale dams within a particular catchment (i) might not have a significant adverse impact on an individual basis and (ii) could have important cumulative benefits, such as downstream sediment reduction. However, they might have a cumulative adverse impact by blocking the access of migratory fish to all or most of their available tributaries. The ESMF should recommend feasible mitigation measures for any such cumulative adverse impacts.
- **Social, Gender, and Resettlement Issues:** The ESA will also determine ways to improve broad-based livelihood improvement through project activities, improve participation and empowerment of women, as well as minimize and mitigate involuntary resettlement requirements. **A Resettlement Policy Framework (RPF) has to be developed in this regard as a separate document.** The RPF would elucidate the need for such a framework, the types, scale and extent of potential losses of assets, existing implementation arrangements and capacity for implementing resettlement safeguard measures, estimated extent of resettlement project-affected persons (PAPs) and budget implications for implementing the RPF, existing grievance redressal mechanisms on which the PAPs could rely, and the monitoring and evaluation (M&E) system to be put in place to support RPF implementation. Impact of HIV/AIDs and other communicable diseases on vulnerable segments of the society should also be examined and their mitigation included in the ESMF.

- **Environmental and Social Rules for Contractors.** For the small civil works to be carried out under Component B (Watershed Management), the ESMF should include a list of generic environmental and social requirements for contractors to follow. Some will be site-specific, such as legal and environmentally appropriate sites for obtaining rocks, sand, or other construction material and for depositing construction wastes. Other such rules involve generic standards for good behaviour by construction workers, such as prohibitions on hunting, unauthorized burning of vegetation, firearms possession (except by security personnel), or inappropriate interactions with local people. Contractors should also be asked to indicate specific measures they will take during construction to prevent HIV-AIDS transmission by the work force. The ESMF should verify that environmental and social rules for contractors—including specific financial or other penalties for non-compliance—will be referenced in all relevant bidding documents and contracts. The Independent EIA of the Kamuzu Barrage Upgrading is expected to include environmental and social rules of conduct, as well as detailed environment-related technical specifications, that the main civil works contractor (and any sub-contractors) would need to follow.
- **Institutional Strengthening and Capacity Building.** The ESMF should describe the main ways in which the project would strengthen the environmental and social management capacity of river basin authorities and institutions involved with water resources management, particularly in the Shire River Basin. This would need to be mainstreamed into project capacity-building activities in all components.
- **Institutional Arrangements for Implementation of the ESA:** The ESMF should clarify the institutional roles and responsibilities including synergy and interaction of activities for effective implementation of the ESA recommendations and mitigation plans.
- **Monitoring and Evaluation Framework.** The ESMF would also describe the monitoring and evaluation indicators and the approach to its monitoring (e.g. by whom, when, how frequently, how reported, and how used for decision making). This will include formulation of reporting formats for critical environmental and social parameters to be monitored, in order to monitor the overall implementation of the ESMF and to take adaptive management actions as needed.

Task 5. Stakeholder Consultation: The Consultant will organize stakeholder meetings at appropriate levels (with the help of the Government of Malawi implementing agencies) to discuss the ESA, ESMF and RPF at various stages (Inception, interim, and final). Inputs from the meetings will be well documented. In particular, the ESA should include an Annex which indicates the (i) consultation modalities used; (ii) date and venue of each consultation event; (iii) which stakeholder organizations and interest groups were invited; (iv) which ones participated; and (v) the main issues raised and recommendations offered, along with whether and how these are reflected in the ESA report. At appropriate consultation events, the Consultant will make presentations with suitable photographs, etc. to indicate good and poor practices (e.g. in watershed management).

Deliverables and Schedule

11. The Consultant will be responsible for the following deliverables:

Output	Description	Timing (months after contract signing)
Inception Report	<ul style="list-style-type: none"> • Description of primary project activities to be analyzed • Description of the environmental and social baseline and key issues in proposed investment and possible 	1 month (report and presentation)

Output	Description	Timing (months after contract signing)
	impact locations • Scoping and screening of key environmental and social issues • Relevant institutional and policy context • Proposed detailed outline of ESA, ESMF, and RPF	
Interim Report	As described in Tasks 3&4: • Draft of ESA • Draft of ESMF • Draft of RPF	3 months (report and presentation)
Final Report	As described in Tasks 3&4: • Final ESA • Final ESMF • Final RPF	5 months (report and presentation)
Data Repository	• Satellite images, software and other data procured or sourced under the Consultancy	Before end of contract

Facilities to be provided by Client:

The Client will facilitate access to key information available with various government agencies. They will also facilitate the Consultant's access to relevant staff in various agencies, help arrange field visits, and organize stakeholder workshops for carrying out of this assignment. They will also facilitate making copies of the reports and their distribution. They will also provide feedback on the outputs within a reasonable timeframe (10 days after presentation).

Reporting Arrangements

Reporting to the Director of Water Resources and Director of Environmental Affairs through the Coordinating Office

Duration

The duration of this consultancy would be 6 months.

Profile and Qualification

The consulting firm should have the following expertise: The Team Leader should be an Environmental and Social Impact Assessment Expert with a minimum qualification of a Masters Degree in Environmental Sciences and having at least 10 years experience in similar work. The other expertise in the team would be as follows:

1. Hydrologist with a Masters degree and having 5 years experience.
2. Water Quality Management Specialist with a Masters degree and having 5 years experience.
3. Land Husbandry/Catchment Management Specialist with a Masters degree and having 5 years experience.
4. Forestry/Biodiversity Specialist with a Masters Degree and having 5 years experience
5. Social Development Specialist with at least 5 years experience in resettlement, gender, and stakeholder consultation.

Annex 2. Questionnaire

QUESTIONNAIRE ON THE ENVIRONMENTAL AND SOCIAL ASSESSMENT OF THE SHIRE RIVER BASIN

(To be addressed to the senior member of a household)

A: Bio-data:

1. Village:T.A.....District.....
2. Head of Household: Name:
3. Male.....Female.....
4. Size of household:
5. Have always been here since.....Migrated from.....
6. Reason for migration.....
7. Satisfaction of this place: (a) Very happy (b) Happy (c) Satisfactory (d) Not happy
8. Reasons for answer given in (7) above:
.....

Household income:

Agricultural	Approximate Annual Income (MK)	Non-agricultural	Approximate Annual Income (MK)

B. Climate and drainage

9. Are you happy with the rainfall regime in this area: Yes No
If not, state why not:
.....

10. Do you experience flooding in this area? Yes No
If yes, what do you think is the main reason?
.....

11a. From your reason above, what do you ought to be done?
.....

11b. What has been or is being done to contain this challenge?
.....

12a. Do you know about climate change?
.....

12b.If yes what does it mean?
.....

13a. Are there any problems related to climate change?
.....

13b. Which are these problems
.....

13c. How are you coping up with these problems?
.....

13d. How are you prepared for climate change
.....

14a. Name of river.....

14b What is the status of the flow regime of the nearby river?

14c. What in your view, do you think is the main reason for your observation?

14d. Then, what do you think ought to be done?

14e. If present conditions of water availability persist, what decision are you going to take?

C. Water supply and sanitation:

15. Source of water supply	Lake	River	Borehole	Dugout well	Gravity-fed

16. Water quality	Excellent	Good	Satisfactory	Poor

17. Sanitation	Water-borne	VIP	Pit latrine

D. Agriculture:

18a. (**Approximately**) How many Hectares/Acres do you posses?

18b What crops do you grow?

18c. To which crops do you apply chemical fertilisers.....

18d. If you did not apply the fertiliser would you get adequate yields?

18e. If not, why.....

18f. Do you use other forms of fertilisation?

18g. Is the method in (4b) above sustainable? Yes No

19a. What form of agriculture do you use? Rain-fed Irrigation Both

19b. If you use irrigation, what system do you employ?
 Canal Treadle pumps Drip Sprinkler Other

(Specify).....

20a. Do you have dams for irrigation

20b. Is the water enough for irrigation

21a. Do you have a water right for the abstraction? Yes No

21b. If not, why?

I/we have yet to apply Have already applied Did not know I/we need one

E. Invasive Weeds

22. Do you know any invasive weeds in your area?

23a. Are you aware of invasive weeds in your area

- 23b. If yes mention them
.....
- 23c. Where are they found
.....
- 24a. Do they give any problems in your daily livelihoods
.....
- 24b. What is the name of the aquatic weed in this area?
25. How long has this weed been here?
26. Where did it originate?
27. What problems does it cause?
28. Is it useful and if yes, what do you use it for?
- 29a. After that use what do you observe in the following year or two?
- 29b. How can it be contained?
30. Is soil erosion a problem in this area and if yes why?

F. Catchment Condition

- 31a. Area there programmes to rehabilitate the sub catchments
.....
- 31.b If yes mention them
.....
32. Who is implementing these programmes /activities
.....
- 33a. Do you think the problems in the catchment will be solved with the existing activities
.....
- 33b. If yes how do you think the problem should be tackled
.....
34. Who should initiate the change (government, villages or NGOs)
.....

G. Soil Erosion

35. What problems do you have with regard to soils
.....
36. Why do you construct ridges every year
.....
37. Are there other practices other than ridges?
.....
38. Mention them if yes
.....
39. Who tells you about practices for soil conservation?
.....
40. How many practices for reducing soils erosion do you know?
.....
41. Which practices are best for soil conservation
.....

42. Which ones do use in your fields

.....
H. Forests and Woodlands

43. How much do you value natural forests and woodlands and why?

.....
44. What benefits if any have you had from forests?

.....
45. Are you satisfied with the current land cover and if not why not?

.....
46. What efforts are being taken to conserve natural forests?

.....
47. In your view, are these efforts adequate and if not, why not and what should be done?

.....
48. There are no trees in the hilly areas – what are the reasons?

.....
49. For how long have been no trees in the hills

.....
50. You are cultivating in the hills which is not good. Explain the problem

.....
51. Do you have enough yields from cultivating in the hills?

.....
52. How do you get food if it is not enough?

.....
53. How do you get enough yields if it is yes

.....
54. Can you tell us what you use for cooking (mbaula, three stones or fuel paraffin) – explain the reason why you are using one of them

.....
55. Is charcoal sold in this area – where does it come from

.....
56. Who makes it (people in the village, from out the village or foresters)

.....
I. Fisheries and aquaculture

57. What are the pressing issues affecting fisheries in this area?

.....
58. What are the main fish species found within the water bodies?

.....
59. What are the common fishing methods used?

.....
60. Are fish stocks adequate, increasing or decreasing and why?

.....
61. What traditional methods if any, were used to conserve fish in water bodies?

.....
62. What is your view regarding aquaculture development if it were to be established in this area?

.....
J. Wildlife Resources

63. How do you get animal protein in this area?

64. If through hunting, what animals do you hunt?
.....

65. What is currently the common species of animals in the area?
.....

66. Which animals are rare and why, in your view?
.....

K. Social and economic needs

67. Please list in order of priority development projects you would require in this area:
(i).....
(ii).....
(iii).....
(iv).....

68. What developments have been established in this area and did the people ask for them?

No.	Type of development project	Yes	No
1.			
2.			
3.			

L. Development plans

69. Have you ever participated in the development plans of your area?
.....

70. How to you come up with them explain
.....

71. Who facilities them (public, private or news officials)
.....

72. How many development plans have you implemented in your area
.....

73. What is the role of GVH in development plans?

M. Existing Problems in the area

74. What are the most serious problems in your area.....

75. How are they cause.....

76. How do you then tackle them if they are present

77. Which is the most serious problem in the area.....

78. What efforts are authorities making to address the challenges you are facing in this area?
.....

Annex 3. Checklist

FOREST/WOODLANDS AND BIODIVERSITY CHECKLIST TO GUIDE KEY INFORMANT INTERVIEWS AND FOCUS GROUP DISCUSSION

A. PLANT (FORESTRY RESOURCES) FOUND IN THE SHIRE RIVER BASIN

- Names of common forest and other plant species and their distribution
- Names of man-introduced forest tree and other plant species
- Value of the forests/woodlands to animal species
- Names of endangered forest tree and other plant species (location, distribution and general status)
- Plant specimen of scientific or aesthetic interest
- Problems facing the forest/woodlands and other plant species
- Management measures (including examples of community based management systems) being undertaken by to address the problems facing forests/woodlands
- Adequacy of the measures undertaken to address forests/woodlands
- Challenges facing the management of forests/woodlands
- Suggested was of overcoming such challenges
- Potential Benefits and significant impacts likely to be brought about as a results of the proposed Shire River basin rehabilitation Project onto the forests/woodlands
- Suggested measures to enhance /mitigate impacts likely to be brought about by the project's implementation

B ANIMAL (BIODIVERSITY) FOUND IN THE SHIRE RIVER BASIN

- Common species of Wild mammal, fish and birds and their current status
- Names of man-introduced exotic species of biodiversity (wild mammals, fish and fowl and their current status
- Names of endangered species (location, distribution and status)
- Names of migratory species (Wild mammals, fish or birds) and their current status
- Names of commercially valued species (wild mammals, birds and fish) and their status
- Measures being undertaken by various stakeholders (including communities) to address the problems facing biodiversity
- Adequacy of the measures being undertaken various stakeholders (including communities) to address problems facing the management of biodiversity
- Challenges facing the management of biodiversity
- Suggested ways of overcoming such challenges of biodiversity management
- Potential Benefits and significant impacts likely to be brought about by the proposed Shire River basin rehabilitation Project onto the management of biodiversity
- Suggested measures to enhance /mitigate impacts likely to be brought about by the Shire River Basin Rehabilitation project onto the biodiversity.

Annex 4: 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 RIVER BASIN DEVELOPMENT PROJECT

INTRODUCTION

This Environmental and Social Screening Form (ESSF) has been designed to assist in the evaluation of planned construction and rehabilitation activities under the Shire River Basin Management Project (SRBMP). 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 EIA), and social work (such as RAP) 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 SRBMP. 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:

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

The form is to be completed by consensus of at least three people, 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			National parks and game reserve							
1.2			Wet-lands							
1.3			Productive traditional agricultural /grazing lands							
1.5			Areas with rare or endangered flora or fauna							
1.6			Areas with outstanding scenery/tourist site							

1.7	Within steep slopes/mountains									
1.8	Dry tropical forests such as Brachystegia species									
1.9	Along lakes , aquifers, riverine ecosystems									
1.10	Near industrial activities									
1.11	Near human settlements									
1.12	Near historic, archaeological, sacred or other cultural heritage sites									
1.13	Within prime ground water recharge area									
1.14	Within prime surface run off									
1.15	Near boreholes or other potable drinking water sources									

2.0 SCREENING CRITERIA FOR IMPACTS DURING IMPLEMENTATION AND OPERATION										
	Will the implementation and operations of the project activities within the selected site generate the following externalities /costs /impacts?	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											
Will the implementation and operation of the project activities within the selected site generate the following socio-economic costs/impacts?											
		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										

¹ **NOTE:** 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

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 Management Plan (EMP), but not a separate EIA; or (iii) the proposed project would need its own EIA (including an EMP), with the EIA subject to review by Malawi’s Environmental Affairs Department. Some examples are provided in the table below:

The Proposed Project Activity Can Be Exempted From EIA and/or RAP Requirements On The Following.	The Proposed Project Activity Needs an EMP and possibly also an EIA.
<ul style="list-style-type: none"> Screening indicates that the site of the project will not be within environmentally-sensitive areas .e.g. protected areas 	<ul style="list-style-type: none"> Field appraisals indicate that the project site is within environmentally –sensitive areas, protected areas.
<ul style="list-style-type: none"> No families will be displaced from the site 	<ul style="list-style-type: none"> Cause adverse socio-economic impacts
<ul style="list-style-type: none"> Identified impacts are minor, marginal and of little significance 	<ul style="list-style-type: none"> Significant number of people, families will be displaced from site
<ul style="list-style-type: none"> Mitigation measures for the identified impacts are well understood and practiced in the area 	<ul style="list-style-type: none"> Some of the predicted impacts will be long term, complicated, extensive
<ul style="list-style-type: none"> The stakeholders have adequate practical experiences in natural resource conservation and management. 	<ul style="list-style-type: none"> 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 DEA Head Office	
Name & Signature of EDO	

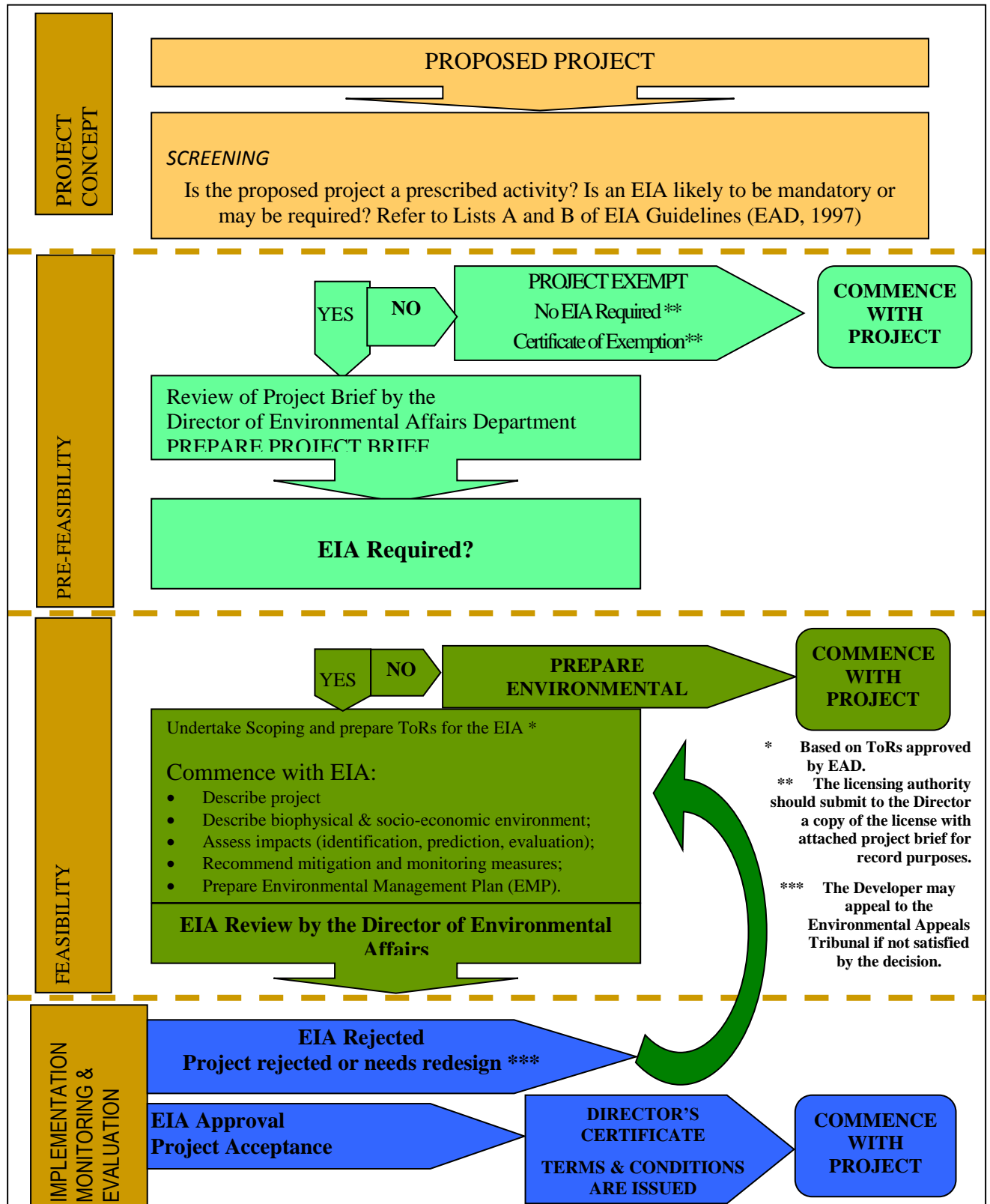
Completion by Director of Environmental Affairs	
Date Received from District Assembly:	
Dated Reviewed:	
Date of Submission of Project Brief	
Date of Submission of EIA Reports	
Date of Approval/Rejection	

NOTES:

- Once the Environmental and Social Screening Form is completed 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.
- 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 5: General EIA Process in Malawi (from EIA Guidelines 1997, EAD)

This chart depicts the Government of Malawi's Environmental Impact Assessment (EIA) review process for development projects with significant environmental impacts. This review process is led by the Environmental Affairs Department (EAD). The Kamuzu Barrage upgrading (Sub-component C.1) will undergo this review process as one project, as will the overall SRBMP as a separate project. Other sub-projects to be funded under the SRBMP would undergo this review by EAD as separate projects only if required as a result of the screening process, to be carried out using the ESSF (Annex 1) as a guide.



Annex 6: Procedures for ESIA Preparation

According to Malawi's Guidelines for Environmental Impact Assessment (December 1997), there are two sequential types of formal EIA submissions which represent progress reports to meet the requirements of Malawi's EIA process. These are Project Briefs and EIA Reports.

A Project Brief is a short report informing DEA that a prescribed activity is being considered. Its sole purpose is to provide sufficient information to allow DEA to determine the need for an EIA based on screening criteria outlined in Appendix D of the guidelines. Thus, a Project Brief must contain the information needed by DEA to evaluate the report against the screening criteria. Section 24 of the EMA requires that a Project Brief should at least state:

- The nature of the project;
- The activities that shall be undertaken;
- The possible products and by-products anticipated;
- The number of people the project shall employ;
- The area of land, air or water that may be affected; and
- Any other matters as may be prescribed.

More generally, the Project Brief should also contain:

- A basic description of the project purpose, size, location and preliminary design, including any alternatives which are being considered (i.e. site, technology, construction and operation procedures, handling of waste).
- The stage of the project in the project cycle.
- A location map of the project site or site alternatives, and a site plan as it is currently known. Maps and plans should conform to the standards discussed in the section describing the requirements of an EIA report.
- A discussion of which aspects of the project are likely to cause environmental concerns, and of proposed environmental management measures.

The *General Requirements of an EIA Report* include: (i) quality standards; (ii) terms of reference; (iii) identification of the EIA team; (iv) discussion of EIA methods; (v) public consultation; and (vi) information and mapping standards.

Typical elements of an EIA report include: (i) an Executive Summary; (ii) an Introduction; (iii) a Project Description; (iv) a discussion of the Environmental Planning and Design; (v) Public consultation; (vi) description of the Environmental Setting; (vii) Assessment of Environmental Impacts; (viii) Environmental Management Plan; (ix) Resource Evaluation; (x) Summary and Recommendations; and (xi) Appendices.

For details on the preparation of the above documents, please refer to *Annex C* of the *Guidelines for Environmental Impact Assessment (December 1997)*. In this context, the ESMF not only complements Malawi's procedures for meeting EIA requirements as outlined in *Appendix C* of the above guidelines, but it also meets the safeguard policy requirements of the World Bank.

Annex 7: Environmental Rules for Contractors

These Environmental Rules for Contractors are prepared for all the contractors to be engaged for the SRBMP construction activities. The rules include provisions for proper management of construction sites, safe storage of construction materials and safe disposal of wastes.

General Considerations

- The contractor shall, in all his activities ensure maximum protection of the environment and the socio-economic wellbeing of the people affected by the project, whether within or outside the physical boundaries of the project area.
- Before any construction works begin, the contractor shall ensure that the relevant environmental and land acquisition certificates of authorization for the works have been obtained from the Director of Environmental Affairs and/or the Commissioner for Lands.
- In general, the contractor shall familiarize himself with the ESMF and the RPF for the SRBMP. Specifically, the contractor shall make every effort to follow and implement the recommendations and mitigation measures of the EMP and the RAPs, to the satisfaction of the MWDI and the EAD, or any such persons or agencies appointed by the MWDI or the EAD, to inspect the environmental and social components of the SRBMP.
- The contractor shall work in cooperation and in coordination with the Project Management Team and/or any other authority appointed to perform or to ensure that the social and environmental work is performed according to the provisions of the ESMF and RPF for the SRBMP, along with any specific RAP and/or EMP.
- The contractor shall always keep on site and make available to Environmental Inspectors or any authorized persons, copies of the EMPs, RAPs and any other relevant documents for the monitoring and evaluation of environmental and social impacts and the level or progress of their mitigation.

Acquisition of Construction Materials

The contractor shall ensure that construction materials such as sand, quarry stone, soils or any other construction materials are acquired from approved suppliers and that the production of these materials by the suppliers or the contractor does not violate the environmental regulations or procedures as determined by the EAD.

Movement and Transportation of Construction Materials

The movement and transportation of construction materials to and within the construction sites shall be done in a manner that generates minimum impacts on the environment and on the community, as required by the EMP and/or the RAP.

Fencing of Construction sites

Construction sites refer to all areas required for construction purposes, including quarries, staff/employee living quarters. The boundaries of the site shall be demarcated prior to any work commencing on the site. It is the responsibility of the contractor to decide on an appropriate system of protective fencing for the site. The site boundary demarcation fence shall be removed when the site is decommissioned and full or almost fully restored to its original state.

The Contractor shall ensure that all their plants, labour and materials remain within the boundaries of the site and he shall ensure that materials used for construction on the site do not blow on or move outside the site.

Storage of Construction Materials and Equipment

Construction materials shall be stored in a manner to ensure that:

- There is no obstruction of service roads, passages, driveways and footpaths;

- Where it is unavoidable to obstruct any of the service paths, the contractor shall provide temporary or alternate by-passes without inconveniencing the flow of traffic or pedestrians;
- There is no obstruction of drainage channels and natural water courses;
- There is no contamination of surface water, ground water or the ground;
- There is no access by public or unauthorized persons, to materials and equipment storage areas;
- There is no access by staff, without appropriate protective clothing, to materials and equipment storage areas;
- Access by staff and public or unauthorized persons, to hazardous, corrosive or poisonous substances including sludge, chemicals, solvents, oils, asbestos cement dust or their receptacles such as boxes, drums, sacks and bags is prohibited.

Solid Waste Management

The Contractor shall institute a waste control and removal system for the site. All wastes shall be disposed of offsite at an approved landfill site in consultation with the District Council. Burning of any waste on any construction site is forbidden. The Contractor shall supply waste bins throughout the site at locations where construction personnel are working. The bins shall be provided with lids and an external closing mechanism to prevent their contents blowing out and shall be scavenger-proof to keep out and other animals that may be attracted to the waste. The Contractor shall ensure that all personnel immediately deposit all waste in the waste bins for removal by the Contractor. Bins shall be emptied on a daily basis and waste removed to a temporary storage site where it shall be properly contained in water and windproof containers until disposed of. The bins shall not be used for any purposes other than waste collection.

In performing his activities, the contractor shall use the best practical means for preventing emissions of noxious or offensive substances into the air, land and water. He shall make every effort to render any such emissions (if unavoidable) inoffensive and harmless to people and the environment. The means to be used for making the emissions harmless or for preventing the emissions shall be in accordance to the RAP and/or the EMP, and with the approval of the relevant Local Authority or the Environmental Affairs Department.

The contractor shall, in particular, comply with the regulations for disposal of cement pipes, construction/demolition wastes, wastewater, combustion products, dust, metals, rubble and timber. Wastewater treatment and discharge will conform to the applicable regulations by the relevant Local Authority and Ministry of Water Development and Irrigation. Hazardous wastes shall be treated and disposed of in conformity with the national regulations and where applicable, with the supervision of qualified personnel.

Wastewater Management

The Contractor shall construct and operate the necessary collection and waste treatment facilities for waste water to prevent pollution. In case where water is mixed with oil/waste, separators shall be installed. The oil should be stored in tanks or drums as hazardous waste and disposed off in approved manner. The Contractor shall dispose of collected waste water in a manner agreed with the respective councils and Environmental Affairs Department.

The Contractor may discharge "clean" silt laden water overland, preferably grass land at the construction site and allow this water to filter into the ground. However, the Contractor shall ensure that he does not cause soil erosion as a result of any overland discharge.

All washing equipment shall take place within the construction camp. Water from washing operations shall be collected in a conservancy tank, remove them from the site and disposed of in the agreed manner. The Contractor is encouraged to recycle dirty wash water to minimise the amount required to be off site.

Trucks delivering concrete shall not wash the trucks on the site or in any environmentally sensitive areas. All washing operations shall take place off-site at a location where waste water can be disposed of in an acceptable manner.

Kitchen wastes shall be disposed into soak pits. Wastewater from campsites will be discharged and disposed in a kitchen sump located at least 15 meters from any body of water. Sump capacity should be at least 1.3 times the maximum volume of waste water discharged. The bottom of the pit should be filled with coarse gravel and the sides shored up with board, and so forth to prevent erosion and collapse of the pit. Sanitary wastes shall be disposed into septic tanks.

Stockpiles, Burrow Pits and Quarries

Burrow pits and quarries shall be prohibited where they might interfere with the natural or designed drainage patterns. River locations shall be prohibited if they might undermine or damage the river banks, or require works in the wetted area, which may carry too much fine material downstream. The Contractor shall ensure that all burrow pits and quarries are rehabilitated to its original or near condition after construction finishes.

Site Restoration

The Contractor shall ensure that all temporary structures, equipment, materials, and facilities used for construction activities are removed upon completion of the project. Any oil and fuel contaminated soil shall be removed and buried in waste disposal areas. Soak pits and septic tanks shall be covered and effectively sealed off and the sites shall be grassed and all the sites shall be restored to a similar condition to that prior to the commencement of the works or to a condition agreed to with council officials. The ESMP will also specify occupational health and safety measures to be followed during project construction including measures to raise awareness and to prevent the spread of HIV/AIDS and other sexually transmitted diseases.

Health and Safety of Workers

The contractor shall protect the health and safety of workers by providing the necessary and approved protective clothing and by instituting procedures and practices that protect the workers from dangerous operations. The contractor shall be guided by and shall adhere to the relevant national Labour Regulations for the protection of workers. In addition, the contractors should indicate specific measures they will take during construction to prevent HIV-AIDS transmission by the work force, in relation or in addition to those indicated in the EMP

Natural Habitats

In all relevant civil works projects, the contractor shall locate project facilities (permanent and temporary) so as to avoid or minimize the clearing of natural vegetation. The contractor shall enforce a strict prohibition on the washing of vehicles or changing of lubricants in waterways or wetlands,

Chance Finds Procedures for Physical Cultural Resources

If, during project construction, the contractor or project workers encounter archaeological relics, fossils, human remains, or other items of historical or other cultural value, the Contractor shall (i) temporarily suspend any works which might damage these items and (ii) notify the Client who then notifies the competent authority for instructions or guidance regarding the appropriate next steps to evaluate, salvage, recover, protect, and/or document the items found.

Worker Behaviour

To help ensure that good environmental and social practices are consistently followed throughout project construction and operation, all workers, operational staff, and contract personnel shall be prohibited from (i) hunting, (ii) fishing, (iii) wildlife capture, (iv) bush-meat purchase, (v) plant collection, (vi) unauthorized vegetation burning, (vii) speeding, (viii) weapons possession (except by security personnel), (ix) working without Personal Protection Equipment (PPE), (x) inappropriate interactions with local people, (xi) disrespecting local customs and traditions, (xii) littering of the site and disposing trash in unauthorised places, (xiii) Use of alcohol by workers during working hours, (xiv) sexual harassment, or (xv) Building fires outside camp areas without being authorised.

Annex 8. List of Stakeholders Consulted during Preparation of the ESMF

No.	Name	Position	Institution	Date
UPPER SHIRE RIVER BASIN				
NTCHEU DISTRICT				
1	Mr. L. Mjumira	Director of Planning and Development	Ntcheu District Council	09/02/12
2	Mr. Chigwenembe	Director of Public Works	Ntcheu District Council	09/02/12
3	Mr. K. Kamoyo	Land Resources Conservation Officer	Ntcheu District Council	09/02/12
4	Mr. M. Gondwe	District Forestry Officer	Ntcheu District Council	09/02/12
5	Mrs. M. Kamoyo	Environmental District Officer	Ntcheu District Council	09/02/12
6	Mr. G. Maloni	Assistant District Agriculture Development Officer	Ntcheu District Council	09/02/12
7	Mr. C. Kachokamanja	Crops Officer	Ntcheu District Council	09/02/12
8	Mr. Makwangawala	Traditional Authority	Ntcheu	09/02/12
9	Mr. T. Bokosi	Farmer	Ntcheu	09/02/12
10	Mai Enelesi	Farmer	Ntcheu	09/02/12
11	Mr. G Billiati	Farmer	Ntcheu	09/02/12
12	Mr. V. Kwananji	Farmer	Ntcheu	09/02/12
MANGOCHI DISTRICT				
13	Mr. B. Jalasi	Farmer	Samama Irrigation Scheme	18/11/11
14	Mr. D. Mtochi	Farmer	Samama Irrigation Scheme	18/11/11
15	Mrs E. Mangulenje	Village	Samama Village	18/11/11
16	Mr. F. Nganire	Village	Samama Village	18/11/11
17	Mr. Y. Tobias	Fisherman	Lake Malombe	18/11/11
18	Mr. T. Mwamadi	Fisherman	Lake Malombe	18/11/11
19	Mr. Y. Gavisoni	Fisherman	Lake Malombe	18/11/11
20	Mr. Mughogho	Director of Planning and Development	Mangochi District Council	13/02/12
21	Mr. L. Mlaviwa	District Forestry Officer	Mangochi District Council	13/02/12
22	Mr. H. Pondeponde	Acting District Water Officer	Mangochi District Council	13/02/12
23	Mr. R. Namwada	Assistant District Forestry Officer	Mangochi District Council	13/02/12
24	Mr. D. Mfunya	Senior Forester	Mangochi District Council	13/02/12
25	Mrs. M. Kamanga	Crop Protection Officer	Mangochi District Council	13/02/12
26	Peter L. Banda	Assistant Statistician	Fisheries Department, Mangochi	13/02/12
27	Mr .E. Kapalamula	Villager	Kandulu Village, T. A. Jalasi	13/02/12
28	Asongwe Issa	Villager	Chiganga Village, T.A. Jalasi	13/02/12
29	Chitambi Binuli	Villager	Chiganga Village, T.A. Jalasi	13/02/12
30	Alick Phiri	Villager	Chiganga Village, T. A Jalasi	13/02/12
31	Silinava Jackson	Villager	Chiganga Village, T.A.	13/02/12

No.	Name	Position	Institution	Date
			Jalalsi	
32	Mr. Makupo	Village Headman	T. A. Jalasi	13/02/12
MACHINGA DISTRICT				
33	Mr. W. Gausi	Director of Planning and Development	Machinga District Council	13/02/12
34	Mr. Kawejere	Chief Lands Resources Officer	Machinga ADD	13/02/12
35	Mr. Mtafya	Assistant District Forestry Officer	Machinga District Council	13/02/12
36	Mr. J. Kasusweni	District Fisheries Officer	Machinga District Council	13/02/12
37	Mr. J. Pemba	Sewerage Attendant	Liwonde Town Council	19/11/11
38	Mr. N. Govala	Sewerage Attendant	Liwonde Town Council	19/11/11
39	Mrs. F. Bauleni	Villager	Liwonde	19/11/11
40	Mrs. V. Tomotiyo	Villager	Liwonde	19/11/11
41	Mr. S. Nyanyali	Division Manager	Liwonde National Park	14/02/12
42	Mr. B. Msikuwanga	Head of Research	Liwonde National Park	14/02/12
43	Mr. S. Meja	District Water Officer	Machinga District Council	14/02/12
44	Mr. S. Chaula	DECK Technician	ESCOM (Liwonde)	14/02/12
45	Mr. J. Chatepa	Marine Technician	ESCOM (Liwonde)	14/02/12
46	Mr. W. Longwe	Marine Technician	ESCOM (Liwonde)	14/02/12
47	Mr. E. Makuzula	Marine Technician	ESCOM (Liwonde)	14/02/12
MWANZA DISTRICT				
48	Mr. Gwedemula	District Commissioner	Mwanza District Council	15/02/12
49	Mr. E. Thamba Phiri	District Water Officer	Mwanza District Council	15/02/12
50	Mr. S. Kananji	Assistant District Forestry Officer	Mwanza District Council	15/02/12
51	Mr. C. Likongwe	District Fisheries Officer	Mwanza District Council	15/02/12
52	Mr. E Kalitsiro	Assistant Land Resources Conservation Officer		15/02/12
53	Mr. M. Nyongo	Farmer	T.A. Nthache	15/02/12
54	Mr. B. Semu	Farmer	T.A. Nthache	15/02/12
55	Mrs. K. Mateyo	Villager	T.A. Nthache	15/02/12
56	Mrs. M. Sailoni	Villager	STA Govati	15/02/12
57	Mrs. D. Chimkota	Villager	STA Govati	15/02/12
58	Mrs. M. Mandalasi	Villager	STA Govati	15/02/12
59	Mr. F. Dulamoyo	Farmer	T.A. Kanduku	15/02/12
60	Mr. K. Zuze	Farmer	T.A. Kanduku	15/02/12
61	Mrs. A. Jere	Farmer	T.A. Kanduku	15/02/12
NENO DISTRICT				
62	Mr. W.M. Kuseli	District Water Officer	Neno District Council	15/02/12
63	Mr.D. Itimu	Environmental District Officer/District Fisheries Officer	Neno District Council	15/02/12
64	Mr. J. Mando	Assistant District Water Officer	Neno District Council	15/02/12
65	Mr. L. Sipolo	Assistant District Water Officer	Neno District Council	15/02/12

No.	Name	Position	Institution	Date
66	Mr. Kampeza			
67	Mr. E. Ngwangwa	District Forestry Officer	Neno District Council	15/02/12
Blantyre District				
68	Ms. M. Lakioni	Assistant Environmental Officer	Blantyre Water Board	15/02/12
69	Mr. Banda		ESCOM (Nkula)	19/11/11
70	Mr. G. Khobwe		BWB (Walkers Ferry)	19/11/11
71	Mr. Chigowo	Chief Land Resources Officer	Blantyre ADD	15/02/12
72	Mr. M. Simba	Land Resources Conservation Officer	Blantyre District Council	15/02/12
73	Mr.G. Kanyerere	District Forestry Officer	Blantyre District Council	15/02/12
74	Mr. A. Simenti	Lab Assistant	Soche Sewerage Treatment Plant	15/02/12
75	Mr. Jackson	Lab Assistant	Soche Sewerage Treatment Plant	15/02/12
76	Mr. Bizi	Labourer	Soche Treatment Sewerage Plant	15/02/12
77	Mr. Kumalireni	Labourer	Soche Sewerage Treatment Plant	15/02/12
78	Mr. E. Kapeya	Registrar of Pesticides	Bvumbwe Agriculture Research Station	15/02/12
CHIKHWAWA DISTRICT				
79	Mr. K. Harawa	Director of Planning and Development	Chikhwawa District Council	16/02/12
80	Mrs. K. Malunga	Farmer	Nkhate Irrigation Scheme	20/11/11
81	Mrs. L. Selemani	Farmer	Nkhate Irrigation Scheme	20/11/11
82	Mrs. V. Chikuse	Villager	Chikhwawa	20/11/11
83	Mr. E. Kawere	Villager	Chikhwawa	20/11/11
84	Mr. Hanifi	Villager	Chikhwawa	20/11/11
85				
86	Mr. N. Dakamau	Assistant Director of Planning and Development	Chikhwawa District Council	16/02/12
87	Mrs. R. Kaira	Assistant District Community Development Officer	Chikhwawa District Council	16/02/12
88	Mr. A. Dickson	Land Resources Conservation Officer	Chikhwawa District Council	16/02/12
89	Mr. Kamngadaza	District Forestry Officer	Chikhwawa District Council	16/02/12
90	Mr. E. Mchilikizo	District Water Development Officer	Chikhwawa District Council	16/02/12
91	Mr. G. Kauta		Evangelical Association Of Malawi	16/02/12
92	Mr. Beleu	Group Village Headman	T.A. Maseya, Chikhwawa	16/02/12
93	Mr. W. O. Mgoola	Division Manager	Lengwe National Park	16/02/12
94	Mr. P. Moyo	Assistant Parks and Wildlife Officer	Lengwe National Parks	16/02/12
95	Mr. B. Sakala	Education and Extension	Lengwe National Park	16/02/12

No.	Name	Position	Institution	Date
		Officer		
96	Mr. T. Manda	Assistant Human Resources Manager	Lengwe National Park	16/02/12
97	Mr. C. Mbewe	Senior Parks and Wildlife Officer	Lengwe National Park	16/02/12
98	Mr. J.C. Mabeti	Research Officer	Lengwe National Park	16/02/12
99	Mr. W. Thomas	Villager	Tomali Village	16/02/12
100	Steven Jasi	Villager	Tomali Village	16/02/12
101	Estere Jasi	Villager	Tomali Village	16/02/12
102	Soda Bire	Villager	Tomali Village	16/02/12
103	Jake Lakeni	Villager	Tomali Village	16/02/12
104	Chimwemwe Sinota	Villager	Tomali Village	16/02/12
LILONGWE DISTRICT				
105	Mr. E. Musopole		Evangelical Association of Malawi	22/02/12
106				
107	Mr. Mikuwa	Chief Water Resources Officer	Water Resources Board	15 / 11 / 11
108	Mr. Manda	Director of Irrigation	Department of Irrigation	15/11/11
109	Mr. Kibu	Director of Land Resources and Conservation	Ministry of Water Development and Irrigation	15/11/11
110	Mr. Nyandule	Controller of Agricultural Services	Ministry of Water Development and Irrigation	15/11/11
111	Mr. W. P. Chipeta	Chief Water Resources Development Officer	Ministry of Water Development and Irrigation	22/02/12
112	Mrs. R.C. Kachuma	Water Resources Management Specialist	National Water Development Programme	22/02/12
113	Mr. D. Kambuku	Senior Hydrologist	Ministry of Water Development and Irrigation	22/02/12
114	Mr. Ngauma	Deputy Director for Crops Department	Ministry of Water Development and Irrigation	23/03/12
115	Mr. Tibu	Senior Land Resources Conservation Officer	Ministry of Water Development and Irrigation	23/03/12
116	Mr. G.J. Munthari	Chief Cartographer		23/02/12
117	Mr. Nyirenda	Chairman	Technical Sub-Committee on Pesticides	23/02/12
NSANJE DISTRICT				
118	Mr. T. Jakisoni	Villager	Nsanje	21/11/11
119	Mr. G. Viola	Villager	Nsanje	21/11/11
120	Mr. N. Msulira	Villager	Nsanje	21/11/11

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Annex 9 . List of ESMF Preparers

Name	Kent Kafatia (Team Leader)
Expertise	Environmental and Social Assessment
Professional Qualifications	MSc. in Water and Waste Engineering
	BSc. Chemical Engineering (Environmental)
	BSc. in Engineering
	Diploma in Water and Environment Management Certificate in Water and Environmental Management
Roles and Experience	Mr. Kafatia was responsible for coordinating the whole environmental and social impact assessment, ensuring that outputs are delivered according to the Terms of Reference and on time; planning and liaising with Client and providing quality assurance and document control.
	Mr. Kafatia has more than 25 years practical experience in water, wastewater and environment management. He has carried out consultancy work and lead consultancy teams on assignments for the Governments of Malawi, Mozambique, Tanzania, Kenya and Rwanda. On most of these assignments, has been directly engaged by the World Bank or has been engaged by the respective governments on World Bank and African Development Bank (AfDB) supported projects. He has worked as a Team Leader on a variety of environmental projects in Malawi and internationally.
Name	Elton Laisi (Hydrologist)
Expertise	Hydrology, Earth Science and Economics
Professional Qualifications	Bachelor of Science
	Post Graduate Diploma in Hydrology
Roles and Experience	Mr. Laisi was responsible for collection of data on hydrology, including but not limited to data on geology, topography, rainfall, evaporation, fisheries and aquaculture development. He also assessed current impacts on water resources; as well as potential impacts by the proposed priority water investments. He analyzed community's perceptions on the proposed interventions and he will look at environmental and social impacts related to energy, transportation, water use as well as impacts related to floods and droughts.
	He has undertaken various assignments in a number of countries in Central, Eastern, Western and Southern Africa. He possesses wide knowledge on the water resources of Malawi, having been in the public sector for 20 years and Controller of the department responsible for water resources and supply in Malawi. His several missions in other African countries have made him an expert on environmental issues in Africa.
Name	Edwin Chiwona (Forestry and Biodiversity Expert)
Expertise	Biology, Conservation and Utilisation of Plant Genetic Resources,
Professional Qualification	PhD in On-Farm Conservation (Finalising)
	MSc in Conservation and Utilisation of Plant Genetic Diversity
	Bachelor of Science majoring in Biology and Chemistry

Roles and Experience	<p>Mr. Chiwona was responsible for assessing the current state of biological resources (flora and fauna including fisheries and aquatic life). He assessed impacts on biological resources by the proposed project; propose mitigation/enhancement measures for each impact identified, and use the information for preparation of the ESMF.</p> <p>Mr. Chiwona has vast experience in environmental management including preparation of environmental and social impact assessments, environmental and social management frameworks and environmental auditing. He has carried out consultancy work for the Government of Malawi and has also been directly engaged in World Bank supported projects. Currently, he is a senior Lecturer at Bunda College of Agriculture.</p>
Name	Nyami Jaff Mulenga (Land Husbandry/Catchment Management Specialist)
Expertise	Natural Resources Research and Land Evaluation, Agriculture
Professional Qualification	MSc. in Natural Resources Research and Land Valuation Bachelor of Science in Agriculture
Roles and Experience	<p>Mr. Mulenga was responsible for identifying and assessing current environmental and social impacts on land resources. He determined potential environmental and social impacts of the proposed project on land resources and designed appropriate mitigation and enhancement measures in relation to land and soil conservation.</p> <p>Mr. Mulenga is an expert in Land Resources Conservation with over 30 years of working experience in soil conservation, agro-forestry, land use planning, land conservation and natural resources management with wide practical knowledge in these areas. He has served as the Director of Land Resources Conservation in Malawi, responsible for advising the Ministry of Agriculture on issues related to land management, soil conservation, soil fertility improvement and agro-forestry as related to food security. He has worked with government, non – governmental organizations and community based organization, particularly the rural communities of Malawi, in soil conservation with emphasis on catchment conservation, land use planning, agro-forestry, rainwater harvesting, land resources surveys and forestation.</p>
Name	Bizalieli Daimon Kambewa (Social Development Specialist)
Expertise	Rural Development and Extension, Agriculture, Animal Science
Professional Qualifications	PhD in Social Science (Rural Development and Extension) MSc. in Animal Science BSc. in Agriculture
Roles and Responsibilities	<p>Mr. Kambewa was responsible for assessing impacts of existing, gender, socioeconomic and cultural practices on the environment. and analyzed potential socioeconomic impacts of the proposed project activities and determined their mitigation measures.</p> <p>He has vast knowledge in social science especially working with rural communities. He has contributed to knowledge on the role of governance mechanisms and tenure systems in the management of</p>

	land and natural resources. He has unveiled the importance of society, culture, local knowledge, and customary (traditional) or local institutions and practices in the management of challenges such as HIV and AIDS, climate change and poverty to rural development and natural resources management.
Name	Jonas Mwatseteza (Water Quality Management Specialist)
Professional Qualifications	PhD in Chemistry
	MSc. in Chemistry
	B. Ed, Science (Hons)
	B. Ed, Science
Expertise	Analytical Chemistry
Roles and Experience	<p>Mr. Mwatseteza was responsible for conducting baseline assessments on key strategic points to determine impacts on water quality. He assessed potential impacts on water quality by the proposed project; and developed appropriate mitigation and enhancement measures for the ESMF.</p> <p>Mr. Mwatseteza is a Senior Lecturer teaching both undergraduate and postgraduate students in Analytical Chemistry and Environmental Chemistry, in the Department of Chemistry, Faculty of Science at Chancellor College, University of Malawi. He also carries out training on special topics in Chemistry as and when needed by various industries, public and private institutions. He is one of the pioneering researchers to apply micro-dialysis sampling for the analysis of metals in environmental samples. He serves as a technical expert in several committees with Ministry of Irrigation and Water Development, Department of Environmental Affairs, and Ministry of Health. He has experience in conducting environmental impact assessments and environmental auditing.</p>
Name	Robert Matengula
Expertise Professional Experience	Environmental and Social Impact Assessment Specialist
	MSc. in Environmental Management
	BA. In Humanities
	Dip. In Social and Development Studies
Roles and Experience	<p>Mr. Matengula was responsible for assessing impacts on the environment. He assessed and analyzed potential environmental and socioeconomic impacts of the proposed project activities and determined their mitigation measures.</p> <p>Mr. Matengula was responsible for site investigation, preparing the report, literature review. He identified and assessed all potential environmental and social impacts of the project. He prepared enhancement and mitigation measures for the identified impacts. He was also responsible for preparing environmental and social management plan (ESMP).</p> <p>His extensive experience in conducting environmental and social impact assessments provided the required expertise for this project environmental impact assessment.</p>