Mpatamanga Hydro Power Project (MHPP)

Terms of Reference (ToR) for a Cumulative Impact Assessment (CIA)

Draft Summary Version for Consultation prepared: 24th October 2022

(Current Final Draft Version aligns with ToR tendered 14th November 2022)

CONTENTS

PRESENTATION OF THE PROJECT

1.1 GENERAL CONTEXT: MPATAMANGA HPP PROJECT

The **Mpatamanga hydropower project** (350 MW) is planned to be built in the Shire River in southern Malawi. The Mpatamanga project will harness the river flow coming from Lake Malawi, which is regulated by the Kamuzu Barrage, and the significant head created by a first dam and the by-pass of a steeply sloped river stretch in the Middle Shire river catchment.

The Project as per the Baseline layout consists of two cascading Hydropower plants;

1. A power station at the main dam will have an installed capacity of 309 MW and will operate as a peaking plant to meet peak demand. The plant will be equipped with six vertical Francis turbine units of 52.5 MW capacity each. The rated discharge of each turbine will be 91.7 m³/s, for a **total rated discharge of 550 m³/s**. The **normal water level at the intake will be at EL 276 m**, the tailwater level at the power plant nominal discharge will be at EL 210.2 m: the rated gross head will be 66 m.
2. A Regulating Dam power station will have an installed capacity of 41 MW or 50MW to bring the flow of the river to its natural state to preserve the Majete reserve located downstream. The plant will be equipped with two bulb turbines of 20.5 MW capacity each. The rated discharge of each turbine will be 136 m³/s, for a total rated **discharge of 272 m³/s**.

The project will create two reservoirs, a large reservoir at the main dam and a smaller reservoir at the regulating dam. The main reservoir will be 22 km in length and will flood an area of 19 km² with a full supply level of EL 276 m. The regulating reservoir will be 6.6 km in length and will flood an area of 1.1 km² with a full supply level of EL 213 m and minimum operating level EL 206.5 m. The reservoir will have an active Volume of 6.9 hm³ (6.9 million m³). The reservoir level will fluctuate by 6.5 m most days.

The following table summarizes the main characteristics of the project as defined at this stage.

Item / Structure	Single Tunnel Alternative	Comment
General information		
Power stations (PS)	Main PS and RD PS	
Installed capacity	309 MW and 41 MW	
River	Shire River	
Position of the Main Power Station	15°43'21''S; 34°43'40''E	
Position of the RD Power Station	15°46'47''S; 34°44'19''E	
Main Reservoir		
Full Supply Level (FSL)	EL 276.0 m	
Minimum Operating Level (MOL)	EL 273.0 m	May be lowered by -1m to mitigate the impact of sedimentation in the upstream part of the reservoir
Design Flood Level	EL 276.5 m	Q 10 000 flood with N-1 gates open
Design Flood discharge	3 710 m³/s	Q 10 000
Total reservoir volume	261 Mm³	
Active reservoir volume	58 Mm³	
Main Dam		
Dam Crest level	EL 278.5 m	
Spillway Gated weir		
Number of gates	4	13 m H x 13 m W
Weir sill elevation	EL 263.0 ml	
Bottom Outlet		
Gate Size	6 m x 6 m	

Sill elevation	EL 235.0 m	
Water intake		
Water intake height	34 m	
Water intake invert elevation	EL 248.70 m	
Main Powerhouse		
Total discharge	550 m^3/s	
Turbine axis elevation	EL 203.40 m	
Regulating Dam Reservoir		
Us Full Supply Level (FSL)	EL 213.0 m	
Us Minimum Operating Level (MOL)	EL 206.5 m	
Ds Full Supply Level (FSL)	EL 192.0 m	
Ds Minimum Operating Level (MOL)	EL 191.38 m	
Downstream Design Flood Level	EL 199.0 m	
Active reservoir volume	6.95 hm^3	
Design Flood	3 710 m^3/s	= Q10 000
Regulating Dam - Gravity blocks		
Dam Crest level	EL 215.50 m	
Regulating Dam Spillway		
Number of gates	4	13 m H x 13 m W
Spillway Weir sill elevation	EL 200.00 m	
Regulating Dam Powerhouse		
Total discharge	272 m^3/s	
Turbine axis elevation	EL 184.50 m	

Table 1. Mpatamanga HPP Project characteristics (before the ongoing revision)

1.2 PROJECT LOCATION

The Project will be located on the Shire River between the existing Tedzani and Kapichira hydropower plants. It is positioned about 35km west of Blantyre in the south of Malawi at the intersecting boundary of two districts: Blantyre to the East and Neno to the West. The Shire River is the largest river in Malawi and is the only outlet of Lake Malawi.

The site of the main dam is about one and a half hours by car from the city of Blantyre, on an existing dirt road (S137) that leads from Chileka Airport to the location of the old Shire Bridge (now washed away) immediately above the proposed site for the main dam at Mpatamanga Gorge. The Mpatamanga Gorge and ridge are distinctive in the landscape, with altitudes between 450-500m that frame the project area. The regulating dam is located around 6km south of the main dam location, just north of the Majete Wildlife Reserve. Heading south from the main dam towards the regulating dam location the area is of lower topography and more undulating hills.

Settlements are dispersed around the main dam and reservoir location, with the area around the regulating dam far more sparsely populated.

The Project site is located upstream from sensitive sites for biodiversity; namely the Majete Wildlife Reserve (MWR) and the Elephant Marsh Ramsar Site.

The location in the national context is shown in Figure 1 below.

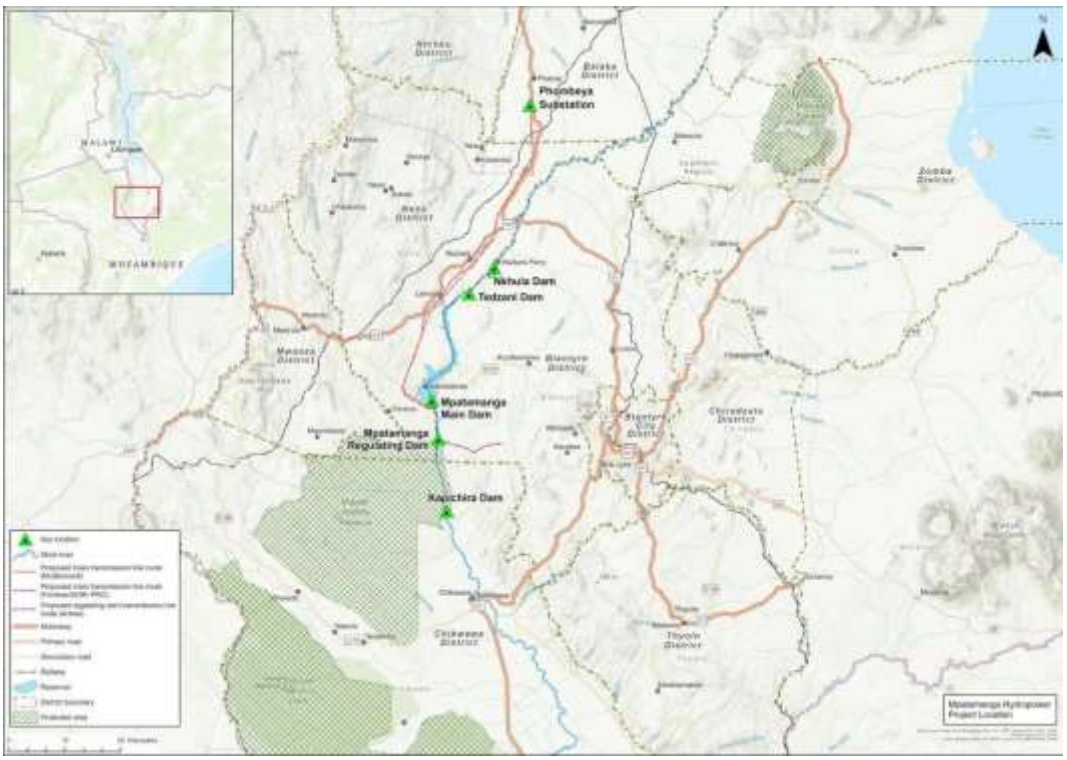

Figure 1. Project Location in the national context

More specifically, the Project (including the Transmission power lines) will be located in the Neno, Blantyre and Balaka districts, and in the Kunthembwe, Mlauli, Symon and Nsamala Traditional Authorities (TAs). The various village head groupings (GVHs) and villages near the Project area are listed in the table below, along with the project infrastructure in close proximity to these villages.

District	Traditional Authorities	Project component	Village
Blantyre	Kunthembwe	Main dam and water reservoir Regulating dam and water storage Regulating dam transmission line S137 access road	Affects GVH Kaliati and GVH Namputu Villages or households from these villages in main dam inundation area: Chaswanthaka, Chikila, Lisangwi Neighboring villages outside the inundation area or along the S137 road: Enosi, Liyedna, Nkoka, Felemu, Chisoni, Ndiranda, Chaswanthaka, Fose No villages are near the RD
Neno	Mlauli	Main dam and water reservoir Regulating dam and water storage Main dam transmission line S137 access road	Affects Felemu GVH Villages in the inundation area: Kambalame Villages along the S137 road: Felemu Villages close to the TL route: Julaya (Julayi/July), Jonathan
	Symon	Main dam and water reservoir Main dam transmission line	No villages in Symon in the inundation area Nearby villages outside the inundation area – Liyedna and Nkoka Villages close to the TL route: Liyenda (Lienda), Joseph, Mkoka, Mbemba, Tedzani, Kandoje, Ngewnyama, Matope
Balaka	Msamala	Main dam transmission line	Villages close to the TL route: Chikapa, Laja,

Source: Mott MacDonald, Mpatamanga Project Draft Environmental and Social Impact Assessment (ESIA) (*February 2021*).

1.3 TRANSMISSION LINES

The transmission lines included in the Project are:

- A 400 kV double circuit transmission line, 64 km long, connecting the substation at the Main Dam to the Phombeya Substation, and;
- A 132kV transmission line for the interconnection scheme for the regulating dam, with two options:
    - 132kV double-circuit 7.3 to 11.4km in loop-in / loop-out between Kapichira and Tedzani regulating dams; or a
    - 132kV single-circuit 6.6 km to the main plant switchyard.

The transmission line routing for the 400 kV line has already undergone optimization (Multiconsult study). It runs parallel to the transmission line for the Mozambique-Malawi Interconnector. The target date for completion of the new Mozambique-Malawi Interconnector power line is around October 2023[1].

The routing for the 132kV transmission line is currently being studied and the preferred option will be defined as part of the design freeze process.

ENVIRONMENTAL CATEGORIZATION

This project has been categorized by the World Bank as a Category A/High Risk Project[2] because it involves:

(i) the physical resettlement of at least 185 households and economic displacement of at least 385 households, a school with 500+ students and an estimated 43-50 households along the T-line and access road,

(ii) negative impacts on livelihoods and increased social risks related to construction-induced immigration,

(iii) impact on critical habitat triggers (several fish species in particular) and

(iv) contribution to cumulative impacts and risks from existing and planned HPPs on the Shire river, in addition to other activities in the catchment, and climate-related vulnerabilities.

APPLICABLE E&S STANDARDS AND GUIDELINES

E&S deliverables must be developed to comply with all applicable regulatory and lender requirements.

The applicable regulatory requirements include, but are not limited to:

- Applicable social and environmental laws, regulations and policies of Malawi relating to concessions, land acquisition and resettlement, labor and working conditions, pollution prevention and control, public health and safety, biodiversity protection and conservation, ethnic groups/indigenous peoples and environmental protection, required to obtain an updated GoM-compliant ESIA/BAP/RAP/CIA for the Mpatamanga HPP;
- Relevant international treaties to which Malawi is a signatory, such as (but not limited to) the UN Declarations, International Labor Organization (ILO) Core Conventions and all other ILO Conventions ratified by Malawi. Special attention should be placed on ensuring compliance with any conventions or treaties to which Malawi is a signatory that are related, but not limited to, any international waterways including the Zambezi River such as the Ramsar Convention and Convention of Biological Diversity.
- International Financing Institution (IFI) standards including:
    - The IFC Performance Standards (2012);
    - World Bank Environmental and Social Framework (ESF) (2017);
    - Equator Principles 4 (EP4) (July 2020).
    - Relevant World Bank Group (WBG) Environmental, Safety, and Health (ESH) Guidelines

[1] https://www.voanews.com/a/malawi-mozambique-launch-power-interconnector-project/6541176.html, accessed 19 September 2022.

[2] Category A in accordance with the World Bank's (previous) Operational Policies and High Risk in accordance with the World Bank's Environmental and Social Framework (ESF) (2017).

- The UN Guiding Principles on Business and Human Rights (UNGPs) (2011).
- Relevant EDF and SCATEC corporate requirements; for example the French Government's loi de vigilance *(Loi 2017-399 du 27 Mars 2017 relative au devoir de vigilance des sociétés mères et des enterprises donneuses d'ordre)*.

TERMS OF REFERENCE (TOR) FOR CIA (SOW)

1.4 INTRODUCTION

Some of the key constraints to further developing Malawi's economy are access to energy, potable water, and irrigation infrastructure. To foster sustained economic growth, the IFC and the World Bank are currently engaged in several existing and potential operations in the Shire River Basin (SRB), namely: Mpatamanga Hydropower Project, Malawi Emergency Power Restoration Project (following cyclone-induced damage to Kapichira HPP), Shire River Valley Transformation Program (SVTP), and the Malawi Watershed Services Improvement Project (MWASIP). The World Bank previously supported the Shire River Basin Management Program (SRBMP). The IFC is a minority equity partner, with the Government of Malawi (GoM) and SCATEC / EDF in the Mpatamanga HPP.

The Shire River (SR) is an important tributary of the Zambezi River, an international waterway shared with Mozambique, and the only outlet for Lake Malawi. The Shire River Basin (SRB) is a strategic resource for Malawi. The vast majority of the country's energy is generated in this watershed, but it also supports significant economic and social activities such as irrigation /agriculture, and water supply for industrial and human use. The Mpatamanga Hydropower Project will help the country meet peak demand but will be the fourth hydropower scheme located in the SRB between upstream and downstream hydropower plants, and future plants planned elsewhere in SRB. Blantyre draws its water supply from the watershed, and the IFC is currently advising the Government of Malawi (GoM) to structure a PPP to improve Lilongwe's water supply. Furthermore, extraction for irrigation in the SRB is expected to continue to increase, with a number of large-scale schemes planned and under execution downstream of Mpatamanga, including the World Bank supported Shire River Valley Transformation Program (SVTP).

Since all these operations are located within the SRB, they are likely to have cumulative environmental and social (E&S) impacts and risks and face similar E&S challenges: the management of sediment inflow and erosion, catchment management, disruption of ecosystems services due to altered downstream flows, impeded riparian habitat connectivity, and allocation of waters between competing generation, irrigation, water supply and ecosystem objectives. Cumulative impacts could potentially involve economic displacement, impacts on nutrition and health, reduced community and women's access to water, decline in important wetlands (Elephant Marsh, Majete Wildlife Reserve), and reduced tourism income.

Climate Change will further stress the Shire River Basin. Floods and droughts are less predictable, more frequent, and extreme – as seen in recent years with Tropical Storm Ana and Cyclone Gombe. These climate-related uncertainties, together with the degradation of the Shire River catchment due to human activity (e.g., deforestation, riverbank encroachment), present a very challenging context to further develop the Shire River Basin in a sustainable manner. If the above risks are not assessed and managed appropriately, poverty will remain persistent and social vulnerabilities will likely increase.

The World Bank-supported SRBMP (2012-2019) developed the SRB planning framework, as well as investing in land and water management. This included: a Shire River Basin Plan, prepared and adopted by GoM in June 2017; the Shire River Basin Atlas; State of the Shire Basin Report; spatial analysis products and 16 sector and thematic studies; revamping of 75 meteorological and 25 hydrological stations in SRB; and the creation of a National Water Resource Authority (NWRA) following the passing of the Water Resources Act in 2013. In addition, a National Forest Landscape Restoration Assessment (NFLRA) provides the best science and knowledge on landscape restoration at the national scale in Malawi, and proven approaches are set out in the National Catchment Management Guidelines and Manual.

IFC has published a Good Practice Handbook (Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets) which includes a summary (pages 15-17) of the requirements of IFC Performance Standard 1 and Guidance Note 1 relating to CIA. IFC believes that when a private sector project sponsor faces cumulative environmental and social impacts, it should have mechanisms for identifying the magnitude and significance of its contribution to those impacts and risks, and should include appropriate mitigation measures as an integral component of the project's environmental and social management system (ESMS). For private sector management of cumulative impacts, IFC considers good practice to be two-pronged:

- effective application of and adherence to the mitigation hierarchy in environmental and social management of the specific contributions by the Project to the expected cumulative impacts; and
- best efforts to engage in, enhance, and/or contribute to a multi-stakeholder, collaborative approach to implementing management actions that are beyond the capacity of an individual project proponent.

Specifically, Performance Standard Guidance Note 1 (GN1), in paragraph GN38, states, "in situations where multiple projects occur in, or are planned for, the same geographic area...it may also be appropriate for the client to conduct a CIA as part of the risks and impacts identification process." Paragraph GN41 recommends that this assessment should be commensurate with the incremental contribution, source, extent, and severity of the cumulative impacts anticipated, and should determine whether the project is incrementally responsible for impacts beyond an acceptable predetermined threshold.

As co-developer of Mpatamanga HPP, IFC supported a Rapid CIA, which delivered a qualitative assessment of a range of scenarios, incorporating existing developments and trends, Mpatamanga Hydropower Project, SVTP, and to a limited extent, climate change. The VECs (Valued Environmental and Social Components) addressed were: (social) ecosystem services support for livelihoods; access to clean, safe and sustainable energy; safety; community infrastructure; (environmental) aquatic ecosystem integrity; river morphology; water quality; riparian vegetation; fish; river-related mammals; river-related birds; (economic) bulk energy production; and tourism. The RCIA identified several knowledge gaps related to the VECs, on sediments and river morphology, water quality, fish and fisheries, and climate change.

1.5 CIA DELIVERABLES SCOPE

This Terms of Reference concerns a full basin-wide CIA that will identify the incremental impacts of the Mpatamanga Hydropower Project, propose measures for their management for implementation by Mpatamanga HPP operators, and propose measures to be undertaken by other developments or parties. Its geographical scope is the Shire Basin, downstream to the Zambezi[3]. The CIA should address the full range of stressors (operational and proposed hydropower plants and barrages, bulk extraction for irrigation, barging operations, and road/railways development, extractive industries, for example) and focus on precisely defined VECs (Valued Environmental and Social Components), applying quantitative data analysis as much as it is available or feasible.

In comparison to the Mpatamanga RCIA, this CIA will: have wider spatial boundaries (up to the Shire Basin); conduct in-person stakeholder consultation in Malawi and the Shire Basin; gather new and existing data; incorporate a full range of existing and future projects and stressors; assess a smaller number of more plausible scenarios (no more than about 7); precisely define VECs; base the assessment of cumulative impacts on VECs on quantitative analysis to the fullest extent feasible; review and confirm proposals for management of Mpatamanga incremental impacts; and propose measures to be taken by other projects and by government. It will provide a more in-depth assessment of the potential accumulated E&S impacts and risks resulting from multiple and cascading infrastructure projects, other human activities and climate-related risks, at the SRB-level.

Further guidance on and examples of CIA that the consultant may refer to are:

[3] While it is up to the consultants to define the CIA geographical scope, current expectations that it will likely span from the Kamuzu Barrage to the confluence with the Zambezi.

- World Bank. 2018. Potential Cumulative Impacts of Hydropower Development in the Kuri-Gongri Basin in Bhutan;
- International Finance Corporation. 2020. Cumulative Impact Assessment and Management: Hydropower: Development in the Trishuli River Basin, Nepal;
- IFC. 2018. Final Inception and Scoping Report: Cumulative Impact Assessment and Management of Renewable Energy Development in the Sekong River Basin, Lao PDR;
- World Bank / ESMAP. 2012. Sample Guidelines: Cumulative Environmental Impact Assessment for Hydropower Projects in Turkey.

Most of these can be found on:

https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/hydro+advisory/resources/cumulative+impact+assessment+resource+page

A number of additional studies are ongoing, led by MHPL and/or the GoM Project Implementation Unit (PIU) and/or will soon be mobilized. The CIA Consultant is required to work closely with the consultants appointed to prepare them (e.g. through participation in joint workshops and consultation events), and to draw these data into the CIA process. These studies are:

- Hydro-sedimentary study, which includes evaluations of sediment transport (bed and suspended loads) and a sediment impact assessment with proposed mitigation measures;
- Hydrology study, including updated assessment of climate change impacts on future hydrology and an updated flood assessment;
- Bathymetry, topography and sedimentology site surveys;
- Flora and fauna studies (complementary baseline surveys and evaluation) are currently underway by national consultants (managed by GoM with World Bank guidance);
- Updated ESIA and ESMMP, including Downstream Impact Assessment;
- Resettlement and Livelihood Restoration Action Plan (RLRAP);
- Biodiversity Action Plan (BAP) and Biodiversity Monitoring and Evaluation Plan (BMEP);
- Human rights risk analysis and assessment;
- Labour influx management study.

The terms of reference for the above studies can be provided to bidders, as part of the bidding process. The respective Consultant teams are required to cooperate to understand their respective scopes of work, workplans, stakeholder engagement, data collection, inputs and interfaces. This is to ensure relevant data is shared, and duplication of effort is avoided. A key consideration for the CIA Consultant is to accommodate data emerging from the hydro-sedimentary, hydrology and bathymetry/topography studies. Further details of the expected dates of deliverables for each study will be provided to the preferred tenderer.

1.6 TASK 1: DATA COLLECTION AND DOCUMENTATION REVIEW

As an initial task, the CIA Consultant is required to assemble existing analysis and available data relating to the cumulative impacts. These may include but will not be limited to:

- Data gathered through the previous Mpatamanga ESIA processes;
- A hydrodynamic model set up for the Elephant Marsh;
- Mptamanga HPP EFlows assessment;
- Mpatamanga HPP Climate Change Risk Assessment (CCRA); and

- Data gathered for the World Bank-supported SVTP;
- Studies undertaken under SRBMP and MWASIP, and the Country Climate Development Report;
- A case study on the impact of climate change on the hydropower resources for Mpatamanga HPP, under the FOCUS-Africa program, and conducted by EDF's Research & Development (R&D) team;
- The studies and data-gathering/monitoring assignments listed above in the Objectives/Scope.

As far as possible for all studies / data gathered or identified, the Consultant will describe the lead organization, stakeholders involved, timing, methodology used (for monitoring programs this will include parameters measured, sampling regime in terms of locations and timing, and survey methodologies), spatial and temporal scope, Valued Environmental and Social Components (VECs) assessed, developments/stressors included, impacts identified, and proposed and implemented measures.

As part of this Task, the Consultant should critically review the Rapid CIA to inform its approach to the CIA. The Rapid CIA was not reviewed or validated by the Strategic Sponsor and is not considered sufficient to meet World Bank ESF requirements. Specific comments on the Rapid CIA have been that: (i) it does not include quantitative analysis of existing or newly-obtained data, (ii) it did not include in-person stakeholder consultation, (iii) it incorporated very few future developments and stressors (only SVTP and climate change), (iv) it assessed a large number of scenarios which are difficult to easily grasp, (v) VECs were not precisely-defined, and (vi) some management proposals are very wide-ranging (e.g. rural electrification).

1.7 TASK 2: PREPARE THE CIA

The Consultant will conduct a CIA with reference to the IFC Good Practice Handbook (GPH), "Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets" and CIA requirements per the WB ESF. The IFC Handbook describes the six-step process that could be used:

- Step 1: Determine Spatial and Temporal Boundaries
- Step 2(a): Identify VECs in Consultation with Affected Communities and Stakeholders
- Step 2(b): Identify Developments and External Natural and Social Stressors Affecting the VECs
- Step 3: Determine Present Conditions of the VECs
- Steps 4 and 5: Assess Cumulative Impacts and Evaluate their Significance in relation to VECs Predicted Future Conditions
- Step 6: Design Management and Monitoring Strategies

Steps 1, 2(a) and 2(b) are the scoping phase of the CIA, which will scope the subsequent Steps 3 to 6 in terms of additional data requirements, analysis and stakeholder engagement to be undertaken.

Key requirements are to:

- Conduct this CIA on the basis of careful consultation with SRB stakeholders, including EGENCO, GoM, irrigation developers and users, among others;
- Conduct the CIA on the basis of sufficient technical understanding, specifically hydrological understanding, water demands of the varied water users in the basin, sedimentological understanding, and other technical understanding that the consultants deem necessary; and
- Incorporate climate change predictions for the SRB as a stressor, building on the analysis presented in the Climate Change Risk Assessment (CCRA) for Mpatamanga HPP and other recent or ongoing work.

The draft recommendations of the Mpatamanga RCIA for this CIA will be provided.

In relation to these recommendations, the Consultant is required to:

- Consider the recommendation for a decision support system as part of Step 6;
- Assemble and analyse data from other studies, augmented by new data collected by the Consultant or the other consultants, on sediments and river morphology, water quality, animal and plant species, fisheries, and climate change (as part of Step 3);
- Incorporate the identified stressors and destressors, as part of Step 2b; and
- Consider the RCIA recommended management strategies, as part of Step 6.

STEP 0: Stakeholder Involvement

Stakeholder engagement is critical to the success of the CIA. Engagement should start early in the process, i.e. Steps 1, 2(a) and 2(b) and continue throughout. Stakeholders will be important in providing information needed for the CIA analysis and essential to implementation of strategies to mitigate impacts.

The Consultant should clearly determine stakeholder roles and responsibilities in the CIA process and establish and maintain a constructive relationship with government and other stakeholders.

The Consultant should recommend a strategy to involve stakeholders in an effective way building upon the SRBMP experience and RCIA, for example through workshops as part of each step of the CIA. CIA objectives, VECs, scenarios, results and management/monitoring strategies must be subject to effective stakeholder consultation and where necessary, agreement. An option is to establish a task force; or steering committee, comprised of key stakeholders whose activities are integral to SRB management.

STEP 1: Determine Spatial and Temporal Boundaries

In consultation with stakeholders, the Consultant must determine both the spatial and temporal boundaries of the CIA. In practice this will be an iterative process with Steps 2(a) and 2(b), and the boundaries may be different for each VEC and development/stressor. It is likely that the spatial boundary will be from Lake Malawi outflow (Kamuzu Barrage) to the confluence with the Zambezi, and the intervening catchment, but the Consultant should consider whether any VECs / developments / stressors upstream of Lake Malawi and downstream of the international border of Malawi into the Zambezi River should be included. In determining spatial and temporal boundaries of the CIA, the Consultant should specifically consider the establishment and justification of interfaces with the Shire River Basin Management Plan.

STEP 2(A): Identify VECs in Consultation with Affected Communities and Stakeholders

In consultation with stakeholders, the Consultant will identify a selected range of VECs and validate them through consultation with the affected communities and other stakeholders. These VECs will be defined in terms of measurable indicators that can be assessed in Steps 3, 4 and 5. The VECs will at least include VECs related to water availability for power generation, water availability for irrigation, sediment transport, indicators of biodiversity (species or habitats) of conservation importance, and communities. It is important that the CIA incorporates social VECs, stressors (poverty and ever-increasing social pressures are an additional stressor on the basin), and how social vulnerabilities are exacerbated by climate change. Note that the VECs that were previously identified in the RCIA are considered to be too general (not focused enough) for this CIA.

STEP 2(B): Identify Developments and External Natural and Social Stressors Affecting the VECs

The Consultant should identify a long list of existing and reasonably predictable developments and stressors that may affect each VEC, and determine which of these are to be applied in the CIA. This will be determined on the basis of relevance to the VECs, stakeholders' views, and the practicality of obtaining sufficient information on the developments (for example their water use, or other details). Where there is a significant potential for further development, but no specific development proposals in place or data available, a scenario of potential development(s) may be considered. This step must deliver well-defined developments and stressors, i.e. defined in terms of how their impacts will be applied in the CIA impact assessment in Steps 4 and 5.

There are a wide range of potential developments to include: construction stage impacts of Mpatamanga HPP (e.g. as regards sediment and water quality impacts; potential operations phase impacts of Mpatamanga HPP); transmission lines of Mpatamanga and other Projects; Zuo Falls hydropower scheme; Shire Valley Transformation Program; Kapichira reconstruction; additional abstraction for water supply etc. The Shire River Basin Plan Volume 7 Investment Plan 2017 will provide useful information, among other sources.

In addition, climate change should be included as a stressor, building on the data and climate scenarios applied in the CCRA for Mpatamanga HPP, the above-mentioned FOCUS-Africa case study, and ongoing MHPL studies.

STEP 3: Determine Present Conditions of the VECs

The Consultant is required to gather baseline information on the selected VECs and trends in their condition, on a 'future baseline'. This can be on the basis of secondary data that is available in existing analysis as well as on the basis of its own primary surveys in selected parameters and locations. VECs should be presented according to the measurable indicators defined in Step 2(a).

A key component of this will be the hydrological and sedimentological regime of SRB. A hydrological baseline will underpin VEC baselines and will be necessary for the subsequent prediction of cumulative impacts. It will be necessary to work closely with the consultants appointed to conduct the sediment study, and bathymetry/topography/sedimentology site surveys.

An important consideration is the concept of 'thresholds' for the VECs. Conditions that cumulate beyond a certain threshold or VECs that fall below a particular threshold, may not be sustainable or viable beyond that threshold (for example, a sustainable level of timber harvesting from a habitat, beyond which the habitat becomes degraded). Thresholds for the selected VECs should be determined, where applicable.

STEPS 4 and 5: Assess Cumulative Impacts and Evaluate their Significance in relation to VECs' Predicted Future Conditions

These are the key steps in the CIA. The Consultant will compare defined scenarios consisting of alternative combinations of proposed developments and existing developments, predicting their impacts on the selected VECs, expressed in terms of their measurable indicators, within the agreed spatial and temporal boundary. Significance must be determined, including in reference to thresholds: when the cumulative impact on VEC condition will approach, be near to, or exceed a threshold, the impact is significant. The analysis may reveal that significant cumulative impacts will exist without some specific developments.

STEP 6: Design Management and Monitoring Strategies

The CIA is required to put forward a Shire River Basin- wide, basin-level comprehensive set of cumulative effects management and monitoring measures that involve the key stakeholders as part of an enforceable planning regime, with the appropriate roles and responsibilities identified as part of a proposed governance mechanism. The CIA should deliver management strategies to mitigate cumulative impacts. Based on an understanding of the gaps in data gathering, analysis, and management actions identified under Task 1 and the predicted cumulative impacts identified under Task 2, the Consultant will propose:

1. Measures that must be taken by the Project to reduce its incremental impacts to non-significant residual impacts;
2. Measures that could be taken by other developers and government across the SRB.

The RCIA set out measures to be taken by the Project, including increasing the operating range of the Mpatamanga RD (to provide greater assurance than the +/-10% rule can be met at all times), the measures (including monitoring measures) set out in a draft Environmental Flows Management Plan, awareness training for operators, and fisheries management of the reservoir. The Consultant may consider and review these proposals, but should not be limited by them.

The RCIA also set out measures for implementation by others, including:

- Implementation of a fisheries management plan;
- Resetting and revaluation of Kapichira Operation and Management to provide uniform flow to the lower river and eliminate sediment flushing;
- Support catchment restoration initiatives through the provision of safe, clean, affordable local and regional electricity; and
- Support key ecosystem functions, services and biodiversity through the establishment of exclusion/limited access zones to restore/create floodplain habitats.

The Consultant may consider and review these measures, but should not be limited by them. Proposals for measures to be undertaken by others should deliver practical ways forward to address cumulative impacts through basin-level initiatives, an enforceable planning regime (protected areas, protected rivers etc.), and governance requirements. The environmental, social and economic benefits and impacts of all measures should be considered.

In addition, the Consultant should take into account the plans and measures developed and adopted under the SRBMP and Malawi Watershed Services Improvement Project or other government programs/initiatives. The Consultant may include these in their recommended management and monitoring strategies (under item 2. “Measures that could be taken by other developers and government across the SRB”), taking into account what has or has not worked in practice.

All proposed measures should take account of existing capacities and if necessary incorporate capacity-building, including of MHPL, other developers, government, and civil society organisations, and experts engaged in the hydropower industry / water resources management.

1.8 KEY DELIVERABLES

The expected key deliverables associated with the CIA process are summarized below.

Key Deliverables
CIA Stakeholder Engagement Plan
CIA Scoping Report
CIA Report

1.9 TEAM PROFILE

The **Project Manager** is expected to have a minimum 20 years' experience, including relevant experience preparing E&S safeguards instruments for complex hydropower projects in developing country contexts, in Africa.

The team must include experts with:

- Long-term experience (10 years or more) of the provision of consulting services on hydropower projects in Africa;
- Wide-ranging environmental expertise and social / community development, including gender, expertise, gained on large hydropower development and other water resources infrastructure;
- Demonstrated experience of delivering CIA processes at river-basin levels, applying the IFC CIA Good Practice Handbook and/or World Bank ESF;
- Delivery of major programs with stakeholder involvement and decision-making in southern Africa and preferably Malawi;
- Hydrology, sedimentology, fluvial geomorphology, and climate change risk assessment capability.

The CIA will be highly multi-disciplinary, so the team appointed to undertake the study should be comprised of specialists from a range of disciplines, for example: hydrology, sedimentology, geomorphology, water quality, hydrodynamics, eco-hydraulics, river and wetlands ecology, terrestrial ecology, EFlows, flora, fish and fisheries, birds, mammals, herpetofauna, sociology, and economics. Amongst them, these specialists should have relevant stakeholder engagement, communications, human rights, and data management skills and experience. If not, this expertise should be integrated in the consulting team through other experts. The team should also have a gender balance and include Malawian team members if possible. For international consultants, association with Malawian specialists (familiar with the local area and with appropriate language skills) is encouraged.

The Consultant is expected to have the qualifications, skills and experience to execute this SoW.

The nominated personnel will be expected to perform the scope of work. The Consultant shall provide and maintain all key experts throughout the assignment; any changes are subject to prior approvals by the Client. If it is necessary to replace any personnel, the Consultant will need to demonstrate that the replacement has suitable qualifications and he/she shall be approved by the Strategic Sponsor/MHPL in advance of undertaking any work.

All Consultant team members should possess appropriate professional qualifications from a recognized university (with higher academic qualifications given additional weighting) and should be experienced in their areas of expertise. Ideally, they should also have successfully worked in Malawi or in physical and cultural environments similar to those found in Malawi or its near neighbors.

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