Terms of Reference for the Preparation of the Environmental Assessment and Management Framework (EAMF) and Site-Specific Environmental Assessments (EAs) for selected project interventions under the proposed Tamil Nadu Housing and Habitat Development Project

A. BACKGROUND

Tamil Nadu has struggled to meet the increased demand for housing and urban services. Tamil Nadu's population living in slums amounts to 5.8 million, representing 16.6 percent of the state's urban population. Data from the 2011 Census show that infrastructure access in Tamil Nadu's slums is less than 60 percent. Overcrowding and lack of basic housing amenities are also prevalent, with only 49 percent having adequate space, 50 percent having a kitchen available, and 61 percent having a toilet. Access to specific infrastructure services is as follows: tap water (81%), closed drainage (78%), water closet latrine (56%), electricity (93%), and cooking with electricity or gas (55%). Overall, housing conditions do not seem to vary much between slum and non-slum housing stocks (except access to a kitchen facility). The state faces a housing shortage in urban areas of around 1.25 million units. Based on a recent demand survey, there are 1.39 million registered applications requesting affordable housing units in Tamil Nadu under PMAY-U, of which about 465,000 have been approved. In Chennai, the slum population amounts to 300,000 households. Thousands of these informal settlements have been built along the banks of various waterways passing through the Chennai Metropolitan Area (CMA).

Recent weather events such as severe flooding in 2015 highlighted the extreme vulnerability of low-income households and their livelihood. The city's high risk for climate-related disasters makes the slums extremely vulnerable to intense rainfall and recurrent flooding given their encroachment of the city's natural drains, which are prone to overflow during heavy rainfall. For instance, in 2015, Chennai broke a 100-year record of rainfall, reaching 374 mm in a period of 24 hours. Major water bodies filled up and water was discharged into the 3 main rivers, causing them to overflow and inundate low lying regions. Around 492,000 dwellings (most of them in slums) were either damaged or completely destructed by the flooding. Soon after, the Tamil Nadu High Court ordered the Government of Tamil Nadu (GoTN) to relocate around 50,000 households living in Chennai's high-risk riverfront areas, occupying the banks of the Adyar River, the Cooum River, the Buckingham Canal, and 22 canals and drains linked to the Adyar and Cooum Rivers. The Chennai River Restoration Trust (CRRT), a trust wholly owned by the GoTN, has been actively involved in the restoration and rehabilitation of these waterbodies, which have been encroached due to rapid and unplanned urbanization. CRRT adopts a multi-sectoral coordination approach to improve the waterbodies and surrounding habitat through diverse interventions, including solid waste removal, provision of green space and parks, installation of sewerage infrastructure, and relocation of households, among others. To date, the GoTN has provided housing units to about 12,000 of these at-risk households. Aside from river flooding, a large portion of Tamil Nadu's population, especially households living in coastal areas, are exposed to other extreme weather events, such as coastal flooding, storm surge, tsunamis and cyclones. These events are likely to increase in frequency as of result of climate change, posing important risks to life, livelihoods, infrastructure, and economic assets.

Key challenges remain if the GoTN is to achieve its slum-free vision; including the need to improve long-term sustainability of the existing housing programs, strengthen the institutional set-up, and foster diversification in the housing sector, and increase private sector participation to achieve greater scale.

As per the request from the State of Tamil Nadu, the World Bank is currently preparing the Tamil Nadu Housing and Habitat Development Project (TNHHDP). The objective is to improve housing conditions of eligible low-income households in Chennai. The proposed project is expected to support the GoTN in both resolving the immediate issue of providing adequate housing for the at-risk population and improving the performance of the state's housing sector at three levels: (i) policy, (ii) institution, and (iii) program level. At the institutional level, the Project would assist the GoTN to strengthen alignment of the institutional set-up and to enhance capacity that responds to the policy goals and efficient implementation. This would entail establishing formal coordination mechanisms between state and municipal-level agencies working on housing and urban development issues and strengthening of existing processes and procedures. At the program level, the Project would support the Government's commitment to move away from one-size-fits-all approach of providing free housing to EWS by introducing a new way of housing delivery model that: (i) diversifies housing products (ii) promotes mixed uses, (iii) integrates incentives for maintenance of the units, (iv) improves community participation in the design and maintenance of buildings; (v) is responsive to gender issues, and (vi) incorporates environmental considerations in location, design and construction.

The proposed project would support the GoTN's objectives to improve long-term sustainability, to achieve greater scale and reach in addressing housing needs and to improve the institutional performance of housing sector while addressing the immediate issue of providing adequate housing for the at-risk low-income households. It is expected that the proposed project would include the following components:

Component 1: Sustainable and resilient housing and habitat development investments.
This component would finance the provision of housing for the EWS and LIG populations in Chennai, particularly those living in slums in high-risk disaster areas. Housing units would be built using disaster-resilient design and standards and in areas with relatively lower risk of disasters. The Project would support the development of a new and comprehensive assessment and targeting system to determine the eligibility of households living in high risk areas to receive improved housing. The proposed new tool will identify and prioritize households that are in most need of improved and resilient housing solutions, including those with the highest levels of poverty and living in high risk areas for climate hazards and other natural disasters. This information breakdown will help the GoTN better segment and prioritize the low-income market for differentiated housing solutions.

Eligible EWS households would receive a package of government assistance that may include one or more of the following support: (i) improved resilient housing unit with access to basic services located within the CMA in existing government-owned land; (ii) compensation and assistance for relocation, when applicable; (iii) menu of targeted social interventions to facilitate and support households' integration and participation in their new environment (e.g. skills development, livelihood support, financial literacy, property maintenance, among others). Eligible LIG households, with some ability to pay for housing, will receive support through the national PMAY-U program, including credit-linked subsidies and in situ development.

Component 2: Enabling private sector participation in affordable housing provision.
Given the need to reach housing provision at scale and the need to tap into private sector participation as much as possible, this component would support an equity contribution (seed capital) for the recently

established Shelter Fund under the TNIFMC.1 The Shelter Fund supports (through equity contributions) public-private projects for the provision of housing to MIG, LIG and EWS segments. Eligible projects need to be structured as independent project companies (Special Purpose Vehicles) with clear governance and accountability structures, professionally managed and independent from government. The proposed project's contribution to seed capital will allow the Shelter Fund to leverage private sector resources from the market to support a larger number of public-private investments for the provision of affordable housing (rental and ownership) in Tamil Nadu. The proposed project would support the Shelter Fund in piloting housing schemes as well as implementing pipeline housing and real estate projects. The projects supported by the Fund will be able to use cross-subsidization amongst income levels (MIG or LIG provide profitability within a development which enables the project to include some EWS units) to enable the supply of EWS housing while minimizing the need for government subsidies2. Some example of possible projects under consideration by the Shelter Fund are: (i) employer-based housing; whereby a large industrial employer provides land or equity for the development of rental housing for its workers, or (ii) women's rental housing; which would support the development of units in industries where single women face challenges to find adequate accommodation. The specific criteria for sub-project selection, including the applicable environmental, social and fiduciary processes will be defined during project preparation. Finally, the team will also explore the possibility of supporting the Shelter fund through a project-based guarantee which could enhance their ability to access financial markets.

Component 3: Institutional reform and strengthening of Tamil Nadu's urban housing sector. This component would identify key institutional and policy reforms and strengthening to support a comprehensive and integrated housing agenda in Tamil Nadu at the three levels previously mentioned: (i) policy, (ii) institutional, and (iii) program-level. At the policy level, the Project would provide strategic assistance to the Government of Tamil Nadu to redefine its role in the housing sector, mainly from one of 'provider' to one of 'enabler' and channel a network of global knowledge and best practices. Technical assistance at the institutional level would support building a strong institutional set-up and bringing together relevant government agencies to achieve the policy objectives. Finally, the component would support improving the state's current housing delivery program. Areas of focus may include strengthening TNSCB's technical, institutional, and implementation capacity for enhancing the sustainability of housing programs, and diversifying housing solutions according to different household needs and characteristics. Additional TA will be explored for key housing and urban development agencies such as Chennai Metropolitan Development Authority and local government in the areas of spatial planning, land-use instruments, land-based financing, and building codes. Prioritization of technical assistance activities will be carried out during project preparation.

Component 4: Project management (completely financed by counterpart funding).
The proposed Project will contribute to the World Bank's corporate commitments, including climate change co-benefits, gender tagging, citizen engagement and maximizing finance for development (MFD). Recognizing Tamil Nadu's vulnerability to extreme weather events, especially in its coastal areas, the Project will incorporate climate adaptation and mitigation measures, which are expected to yield climate change co-benefits. Mechanisms to incorporate citizen engagement through inclusion of voice,

[1] The TNIFMC is an independent financial institution created in 2016 and promoted by the GoTN as an asset management company, regulated by the Securities and Exchange Board of India (SEBI) to float and manage investible resources into infrastructure projects in Tamil Nadu.

[2] It is important to note, that subsidies might still be needed for those projects whose economic and financial models cannot reach breakpoint, however in all cases the existing programs will be used to support only eligible population as per the assessment and targeting system developed under the project.

participation, and accountability – especially of women, vulnerable, and marginalized populations – will be fully integrated into the design of the Project. Finally, the Project will support MFD through an equity contribution to the GoTN's Shelter Fund, which aims to enable greater private sector investment in affordable housing.

B. PART A: PREPARATION OF THE ENVIRONMENTAL ASSESMENT AND MANAGEMENT FRAMEWORK (EAMF)

OBJECTIVES

The main objective of this assignment is to develop an **Environmental Assessment and Management Framework (EAMF) for** the project, including the collection of all required data, information and materials. This shall provide clear, comprehensive and practical guidance to the GoTN on integrating an environmental due diligence process into the project's implementation. The EAMF will at a minimum ensure the following

(i) present a baseline environmental profile of select project areas
(ii) identify all relevant potential environmental issues and risks that may arise because of the proposed interventions that it will support, including impacts related to suitability of sites selected for relocations, legacy issues and planned development of sites to communities will be relocated from;
(iii) specify appropriate roles and responsibilities of involved implementing agencies;
(iv) develop an assessment methodology for potential sub-projects, that will allow an environmental risk classification and the identification of appropriate safeguards instruments;
(v) outline the required procedures for managing and monitoring environmental risks and concerns related to the projects, and develop the TOR for appropriate safeguards instruments (such as, EIAs, EMPs, and / or flood mitigation plans, coastal zone clearances, etc.) as appropriate and required;
(vi) determine the training, capacity building and technical assistance needed to successfully and effectively develop and implement the required safeguards instruments for investments planned during the project.
(vii) establish the funding required to implement the EAMF requirements; and
(viii) provide practical information resources for implementing the EAMF, including guidelines and good practice notes.

The project aims to promote more sustainable solutions to housing and supports the provision of housing to support EWS population currently living in slums and/or in encroachments within the river banks. The project will overall be environmentally beneficial in the long run. It also focuses on promoting more environmentally and socially sustainable housing settlements within then city. It is expected that the housing investments will lead to site-specific and temporary impacts associated with construction work, such as land clearance, dust, noise, vibrations occupational and public health impacts and impacts due to need of construction material such as sand, gravel and metal that are sourced from the environment. It will also involve associated impacts that can arise due to demolition and clearance of existing settlements post relocation, such as those indicated above and will also need to be specifically mitigated. While it is understood that most of the sites where housing will be provided will be government land in urban areas; it is essential, with Chennai being a coastal city, to ensure that investment locations pertaining to Coastal Regulation Zone (CRZ)-1, if any, should necessarily be avoided

This EAMF will need to be consistent with (a) the national requirements that governs the sector and in accordance with the environmental regulations of the State of Tamil Nadu (b) the World Bank's operational policies on environmental safeguards (***Please refer to Annex 1 for the World Bank Environmental Safeguards Operational Policies and their initial applicability to the project).***

The EAMF will serve as a template for site-specific environmental assessments to be undertaken for project-supported physical activities prior to contracting and/or disbursement of funds for the respective activity. The main purpose of the EAMF is to develop environmental profiles of the project sites, identify potential environmental impacts early in the project cycle and to provide broad guidelines outlining measures, processes, institutional arrangements, procedures tools and instruments that need to be adopted by the project and integrated into project implementation to mitigate environmental risks and impacts including climate and disaster related risks. The EAMF will: (i) articulate the criterion and due diligence processes for each project component, sub-component and any physical activity that may be known at this point of time; (ii) contain precise time-bound action plans to assure compliance; and (iii) provide guidance for the participatory approach and outline the public consultation process. It will also institutional capacity assessment to manage safeguard risks and impacts, identify existing staff that could take safeguard responsibilities or suggest for recruitment of staff and develop a budgeted capacity building plan for safeguard management. The EAMF is also required to provide a generic environmental management plan to be adapted as necessary for those activities that do not require environmental assessments. (Annex 2 includes the Guideline for Preparation of Generic EMP for Project Activities under the EAMF.)

Overall, consistent with existing national legislation and the World Bank Operational policies, the objective of the EAMF is to help ensure that activities under the proposed project will:

(i) Prevent adverse environmental risks and impacts;
(ii) Enhance positive environmental outcomes;
(iii) Ensure protection of environment, health and safety;
(iv) Ensure compliance with applicable national environmental policies and legislation; and
(v) Ensure compliance with applicable World Bank environmental safeguard policies.

SCOPE OF WORK OF THE EAMF

Overall, the consultant is expected to prepare the EAMF carrying out the following at minimum, which will also form the sections of the respective reports, a generic Table of Contents for the EAMF is presented in **Annex 3**:

<u>Task 1: Description of the project components</u>

i. Study the project components in detail and describe the range of activities that will be funded by the project and its geographic and environmental context.
ii. Describe the project background, objectives and description of activities
iii. Describe the purpose and objectives the EAMF

<u>Task 2: Policy, legal, and administrative framework</u>

i. Assess and describe the national environmental policies, legislation (laws and regulations) and institutional framework relevant to project activities. This should also include but not limited to regulations relevant for raw material extraction for construction, clearances, permits and licenses, etc. List out permits, approvals, clearances that are required to be taken at different stages for proposed project investments.

ii. Assess and describe the applicability and actions necessary based on the relevant World Bank safeguard polices and World Bank Group Environmental Health and Safety Guidelines.

Task 3: Environmental Baseline of Project Sites

i. Describe the potential project area with regard to key physical, biological, and socioeconomic baseline conditions.
ii. Provide an overview of the salient environmental features and issues in the selected project sites particularly relevant to the project activities via field visits, desk and map review and consultations.
iii. The following needs to be assessed for the overall project area.
   - Physical environment: general topography, geology, hydrology and flow regimes, drainage, water quality, municipal infrastructure etc.
   - Biological environment: Ecologically important or sensitive habitats, such as wetlands, forested areas, coastal areas and the presence of protected or proposed-to-be-protected areas delineated on a map of the project area,
   - Sites of Cultural Value:, significant natural, cultural or historic sites, etc.
   - A separate annex in the form of a compilation for each selected site should be provided. Sites include both sites to which human settlements will be relocated and sites where relocation will be taking place from.

Task 4: Determination of potential environmental impacts

The consultant should provide:

i. An overview of the main environmental issues existing in the project area that are closely linked with project investments envisaged, both for greenfield sites and any insitu developments, that need to be considered and addressed in meeting project objectives; and more specifically,
ii. Discuss positive and negative impacts of each investment planned under the TNHDP, identify possibilities for cumulative impacts and, most importantly, identify opportunities for enhancing environmental features in the urban landscape.
iii. Discuss the suitability of sites identified for relocation of settlements.
iv. Discuss impacts on project achievements from post-project operations such as poor waste management in settlements, congestion etc. that will eventually reduce the quality of the urban environment, if any.
v. Describe how the identified impacts and issues can be avoided, reduced or mitigated in summary in the text and in the form of Generic Environmental Management Plans in line with project interventions. **Annex 2** provides a Guideline for the Preparation of Generic EMPs Environmental Management Plan (EMPs) for Project Activities.
vi. Identify activities that may result in significant, irreversible adverse environmental impacts and include such activities as a negative list in an annex of the EAMF.

Task 5: Preparation of Environmental Assessment and Management Framework

i. Describe an overall environmental management strategy for the proposed project activities. This should include;
   (a) Environmental screening criteria for identifying due diligence actions
   (b) Environmental assessment and management instruments (such as preparation of strategic environmental assessments, environmental assessments, environmental management plans, environmental audits, etc.) to be adopted by the project for

mitigating and monitoring identified issues. The terms of references for such instruments should be annexed to the EAMF. In addition, environment, health and safety guidelines to be followed, a generic environmental management plan that could be adapted by the project and sample safeguards compliance and monitoring and reporting formats should be also annexed.

(c) Estimate the budgetary requirement for the implementation of the environmental management strategy.

ii. Identify institutional arrangements for implementation of the environmental management strategy, at all levels, which should particularly focus on mainstreaming environmental management into the operations of these institutions at different levels. Identify the existing institutional capacity constraints as well as training needs for effective implementation of the environmental management strategy. A training plan should be included with indications of budgetary requirements;

iii. Describe arrangements and mechanisms including institutional arrangements for implementation of for stakeholder consultations, community participation and information dissemination in preparation and implementation of environmental management strategy described above; and arrangements to address project related grievances via a project specific Grievance Redressal Mechanism (GRM),

Task 6: Carry out public consultation meetings

i. The Consultant will organize consultations with project stakeholders and with interested parties (such as local NGOs & CBOs) on the environmental aspects of the proposed project, including mitigation measures for addressing the risks and impacts.

ii. As consultations on social aspects will be conducted by the social consultants of the TNSCB, a member of the social team should join the consultations to understand and document any social related complaints that may be raised during the consultation.

iii. The attendees should be provided with a summary of the project and briefing on the impacts and analyses developed in non-technical local and English language.

iv. Details of consultation, including lists of stakeholders met, concerns and issues raised, and details of why and if any feedback was found to be useful in improving the EAMF, will need to be presented in the EAMF.

C. PART 2- PREPARATION OF THE ENVIRONMENTAL ASSESMENTS FOR THE HOUSING DEVELOPMENT SITES- INSITU AND/OR GREEN FIELD

OBJECTIVES

i. To assess the existing status of environment in the study area and to identify threats and issues which have potential to adversely impact important environmental features of the project influence area.

ii. Carry out environmental analysis of project area and potential activities envisaged under the project.

iii. Analyze various options available in the site layout for project interventions, areas of resettlement and arrangements for any ancillary facilities (burrow sites etc.) to minimize adverse impacts and enhance positive impacts, where feasible.

iv. Identification of families living within the project area, assessment of loss of livelihood / property resources for people living within the proposed site and in its immediate vicinity through primary surveys / consultations

v. Prepare a site specific environmental assessment report by documenting environmental features of the project area, socio-economic and cultural status of community in and around the probable project site. This assessment should also include considerations of safety – both for the workers in the site and related facilities, as well as of nearby residents, especially those that live close to ancillary facilities like burrow areas, for instance.

vi. To identify the environmental issues associated with implementation of the infrastructure proposed and develop environmental codes of practices for common activities like site preparation, construction activities, management of waste, occupational health and safety, etc. and exclusion list that need to be followed during various stages such as planning and design finalization, construction and operation & maintenance.

vii. To undertake consultations with communities of the project site and neighboring communities understand their views, obtain their input regarding environmental issues, and to take these into account during the preparation of the Environmental Assessment (EA) and Environment Management Plans (EMPs).

viii. To prepare a detailed final EMPs in matrix form, that will outline actions that will be required during project implementation and operation from an environmental, health and safety, to mitigate envisioned impacts for inclusion in project contracts for implementation.

SCOPE OF EAs

The Environmental Assessment (EA) study (and the report) will specifically cover the key areas highlighted in **Annex 5** of this TOR.

D. REPORTING REQUIREMENTS

The Consultant shall report to the Environmental Cell of the TNSCB for the execution of the scope of services and deliver the outputs under the direct supervision of the Environmental Consultant (EC) of the Project. Reporting will be presented on the EAMF and the EA preparation. A fortnightly meeting and briefing shall be required between the Consultant and the relevant staff of the TNSCB.

All required reports will be submitted to the EC. The Consultant will coordinate closely with the EC as well as with the relevant government agencies in executing all aspects of this work and in doing so, will engage in active knowledge transfer methods and procedures for the relevant activities' planning and design for key stakeholders to be agreed upon at the beginning of the contract. This function, while not necessarily involving formal training sessions, is considered an important element of the Consultant's work. In addition, the Consultant will engage in the following:

- *Documentation.* The Consultant will establish and maintain a comprehensive inventory of all relevant documents and data collected. Any confidential material provided to the consultants will be returned in an organized fashion to the Ministry at the end of the contract.
- *Personnel.* The Consultant must provide and maintain all key personnel proposed. Any changes are subject to approvals from the contracting authority.
- *Logistics.* The Consultant will be responsible for all their logistical need in-country including workspace, office support, communications and transportation. The proposed work involves significant interrelated activities and subcontracting and consistent

coordination with the Ministry. As such, there will be a need for general project administration and technical coordination including:

- Project Supervision
- Regular Progress Meetings and Reporting
- Contract Management
- Subcontracting Plan and Management
- Scheduling and Logistics
- Report Oversight, Quality Control and Coordination

All deliverables shall be submitted in electronic form and in hardcopy (3 copies each deliverable) in English. A copy of the Executive Summary of the final EA will be submitted in English and Tamil. All hardcopy documents shall be two sided printed to conserve paper. All deliverables will be considered draft upon initial receipt. Draft documents will be reviewed and accepted or comments will be provided within two weeks of receipt. The Consultant shall appropriately address concerns and provide final deliverables within two weeks of receiving comments unless a mutually-agreed upon arrangement stipulates otherwise. It is anticipated that the duration of this contract will be for 8 months.

All reports will be reviewed by the PD, EC and TNSCB and subject to World Bank clearance.

C. COMPOSITION OF TEAM

The Consultant will be required to identify Key Personnel and provide sufficient qualified personnel to ensure achievement of all objectives of these tasks.
It is expected that the following categories of key professional personnel will be required:

- Senior Specialists (minimum 15 years relevant experience)
- Specialists (minimum 10-15 years relevant experience)
- Mid- Level Specialists (minimum 5-10 years relevant experience)

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

1) Team Leader preferably with at least 15 years of national/ international experience, hold graduate level qualifications of a Master's Degree at minimum, English language capacity and broad knowledge in environmental impact assessment and mitigation, long term impact planning and carrying capacity and/or limits of acceptable change methodologies, and institutional strengthening. The Team Leader should have significant experience in undertaking environmental assessments, reporting, capacity building, and environmental advisory services.
2) Co- Team Leader Senior Environmental Specialist, with at least 15 years of experience, hold graduate level qualifications of a Master's Degree at minimum having English language capacity and broad knowledge in Environmental Assessment and Management.
3) Key Team Members- The Consultant may combine specialists so long as the required expertise capabilities can be demonstrated via the qualifications and experience of the Specialists which should span over 10 years and minimum with a Master's Degree at minimum.

- Environmental Management Specialist

- Geologist
- Ecologist
- Botanist
- Zoologist
- Civil Engineer
- Water Resources Specialist
- Hydrologist (hydrogeologist)
- Health and Safety Specialist
- Geographical Information System Expert

In addition, the Consultant may need to solicit additional, short term international and local assistance from senior, mid-level and junior technical professionals with the following qualities, as needed:

The Consultant may wish to propose alternative staffing configurations to ensure achievement of all objectives. The availability of each proposed staff person must be identified as well as whether they are full-time staff persons of the Consultants firm or subcontractors or consultants.

Note: Describe here the reporting and delivery arrangements with the client: to be completed by client as permissible. To be filled in discussion with client.

E. DELIVERABLES

Part A of the assignment will be completed over 2 calendar month period and Part B will be completed over 6-8 months, and no later than 3 months after the sites of the housing investment projects are specified. Deliverables should be submitted directly to the TNSCB as per the schedule of delivery shown below. All payments are subject to clearance of the documents from the Client.

The TNSCB will be responsible for providing all details pertaining to specific project sites, including conceptual plans, design diagrams, feasibility studies or any other relevant information available.

The Final EAMF and site-specific EA Reports (including the EMP and one for each site) should be prepared by the Consultant based on the comments of the World Bank and Client on the drafts.

	Deliverable Under PART A	Time Line
1	Draft Environmental Assessment and Management Framework	1.5 Months from contract date
2	Final Environmental Assessment and Management Framework	2 Months from contract date
3	Local language translation of Executive Summary of Final Environmental Assessment and Management Framework	2Months from contract date

	Deliverable Under PART B	Time Line
1	EA Scoping Report	1 Month from contract date
2	Draft site-specific Environmental Assessment	5 Months from contract date
3	Final site-specific Environmental Assessment	6 Months from contract date
4	Local language translation of Executive Summary of Final site-specific Environmental Assessment	6 Months from contract date

Annex 1: World Bank Environmental Safeguards Operational Policies and their applicability to the Project

Environmental Assessment OP/BP 4.01

The project is categorized as a Category A project in line with the impacts associated with the resettlement of large groups of people and the potential impacts associated with human resettlement. The project aims to promote more sustainable solutions to housing and supports the provision of housing to support EWS population currently living in slums and/or in encroachments within the river banks. This, in coordination with other efforts that are being carried out by the Chennai River Restoration Trust (CRRT) to clear the riverways are expected to contribute positively to manage climate-induced extreme events such as flooding, and thus the project will overall be environmentally beneficial. It also focuses on promoting more environmentally and socially sustainable housing settlements within then city. The housing investments will lead to site-specific and temporary impacts associated with construction work, such as land clearance, dust, noise, vibrations occupational and public health impacts and impacts due to need of construction material such as sand, gravel and metal that are sourced from the environment. It will also involve associated impacts that can arise due to demolition and clearance of existing settlements post relocation, such as those indicated above and will also need to be specifically mitigated.

The overall project will be guided by an Environmental Assessment and Management Framework (EAMF), prepared by the project proponent, which will provide the due diligence requirements, nature and process of environmental screening and assessments, technical guidelines and generic terms of references and EMPs for the nature of project interventions proposed. The EAMF will also include a basic assessment of all land parcels (where households are to be relocated to and from). While the exact nature of the infrastructure set up will not be known, this will still allow the EAMF to include site assessments on environmental aspects and suitability of these sites. At this time, it is expected that all these parcels will be government owned lands. Specific environment safeguards instruments will be prepared once the designs of the housing units are finalized for these sites during implementation.

For all front runner subprojects that have identified sites, once preliminary designs are finalized, either site specific Environmental Impact Assessments (EIAs) or standalone Environmental Management Plans (EMPs) will be prepared, based on the deductions made post environmental screening. It is expected that housing projects at the scale in which is to be financed, will typically warrant standalone EMPs in the context of the regulatory requirements of the State of Tamil Nadu.

Natural Habitats OP/BP 4.04

While it is understood that most of the sites where housing will be provided will be government land in urban areas; it is essential, with Chennai being a coastal city, to ensure that investment locations pertaining to new coastal eco-systems and river bank ecosystems, if any, should necessarily be avoided. The due diligence requirements to ensure that all requirements pertaining to OP4.04 will be covered under the screening procedures and other provisions laid out in the EAMF.

Physical Cultural Resources OP/BP 4.11

While no project activities are expected near or expected to affect physical cultural resources, as defined by OP/BP4.11, the policy is triggered as a precautionary measure to ensure the adequate due diligence on physical cultural resources associated with the human settlements being relocated, if any, is adequately exercised. Measures on safeguard chance finds and due processes will be included as part of the mitigation measures defined in EAMF OP/BP 4.01.

Safety of Dams OP/BP 4.37

Selected sites could require building of embankments. Although such chances are small, a clearer determination will be made once a clearer understanding of the sites to be included for project investment are known.

Annex- 2 Guideline for Preparation of Generic EMP for Project Activities under the EAMF.

The EAMF shall include a Generic EMP which will outline, based on the nature of project activities envisioned and impacts identified, measure to prevent, mitigate and monitor each impact identified during EAMF preparation.

The EMP should be presented in Matrix form, as per the guidance provided below and will describe actions to be taken in sufficient detail to guide the preparation of EAMFs most detailed environmental screening that will be undertaken during project implementation.

It should include in generic form who is responsible, how and when it will be implemented, what will be done and what results will be achieved, why it is being done, and how to know whether it is effective in addressing the underlying concerns.

The EMP should cover all potential impact areas identified and present mitigation measures and prepared as per the following format.

Project Activity	**Potential Environmental Impacts**	**Proposed Mitigation Measures**	**Institutional Responsibilities** (Implementation and Supervision)	**Estimated Quantities Required and Material Specifications Recommended**	**Cost Estimates**	**Comments** (e.g. secondary impacts**)**
Detailed design and planning Phase						
Pre-Construction Phase -Site Preparation						
Construction Phase						
Operation and Maintenance Phase						

Annex 3- Generic Table of Contents for Environmental Assessment and Management Framework

1. Table of Contents
2. List Abbreviations and Acronyms
3. Executive Summary
4. Chapter 1: Introduction to the Project
   4.1. Sectoral and Institutional Context
5. Chapter 2: Introduction to Prevailing Environmental Conditions in Project Area
6. Chapter 3: Environmental Baseline Information of the Project Area
7. Chapter 4: Environmental Legislation, Regulatory and Institutional Framework in India & Tamil Nadu
8. Overview of Environmental Legislation
   8.1. Detail Review of Key Environmental Legislations in relation to Environmental Issues and their Applicability to the Project
   8.2. A Summary of Existing Acts and Policies that have bearing on the environment, in connection with the Project
   8.3. Overall Administrative Structure at Central, State and Local Level for the Project
   8.4. A Summary of Institutions Relevant to the Project and Their Mandate
   8.5. Compliance with World Bank Operational Policies
   8.6. World Bank Safeguard Policies
      8.6.1.Compliance with World Bank Safeguard Policies Triggered.
      8.6.2.WB ESH Guidelines
9. Chapter 4: Assessment of Environmental Impacts
   9.1. Overview
   9.2. Project Specific Preliminary Assessment of Environmental Impacts
   9.3. Construction Phase Impacts
10. Chapter 5: EAMF Procedures & Requirements
   10.1. Environmental Safeguards Processing Steps
      10.1.1. Environmental Screening of Identified Physical Subprojects
      10.1.2. Screening Method
      10.1.3. Preparing Environmental assessments, management plans (including Monitoring Instruments)
      10.1.4. Environmental clearance procedural and standards requirements at the national and state level
      10.1.5. Compliance Monitoring and Reporting requirements
      10.1.6. Stakeholder Engagement
      10.1.7. Disclosure of environmental assessment and management documents
      10.1.8. Diagrammatic representation of EAMF procedures
   10.2. Sequence and Action Plan of Recommended Environmental Safeguards instruments for subprojects to be financed under the project.
   10.3. Typical Timeframe for planning and carrying out environmental safeguards assessment
   10.4. Safeguards Training
11. Chapter 6: Institutional Arrangements
   11.1. Overall Project Institutional Arrangements
   11.2. Institutional Arrangement for Implementation of the EAMF
   11.3. Rough Cost Estimates for EAMF implementation for Project

7 Annexes (All Maps, Photographs, Generic EMP, Guidelines and other relevant documents should be presented as annexes and cross referenced in the main text)

Annex 4 List of Guidance and Supporting Documents to be Shared with this Terms of Reference

(The Bank Team will provide these to the client for sharing with consultant)

1.	Detailed Project Description of the TNHHDP
2.	World Bank Group- General Environmental Health and Safety Guidelines
3.	World Bank Environmental Guidelines for Decommissioning and Demolition of Existing Buildings
4.	World Bank Chance find procedure for Physical Cultural Resources
5.	World Bank Guidelines for the Rehabilitation of Borrow Pits
6.	World Bank Stakeholder Consultations in Investment Operations Guidance Note
7.	Examples of World Bank Project Environmental Assessment and Management Frameworks.

Annex 5: Scope of EA

1 List of Acronyms and Abbreviations

All acronyms and abbreviations used in the EA must be clearly and succinctly defined and described in this section. This will relieve the reader of the need to search for the first occurrence of a word and the citing of the acronym or abbreviation in the text.

2 Executive Summary

A general summary of the EA shall be provided in this section. The summary shall be written using a vocabulary that can be easily understood by the public. It shall include at least the following information about the project from the EA:

- Objectives and Justification
- Location
- Project Proponents
- Project Description
- Other Project Alternatives
- Regulatory and institutional review
- Environmental Setting
- Evaluation of Impacts
- Mitigation and Monitoring Measures
- Environmental Management Plan
- Issues raised by stakeholders and any outstanding issues

3 Project Information

3.1 Objectives of and Justification for the Proposed Project

- **Objectives:** A statement of the general and specific objectives (purpose) of the proposed project, including whether it is a new project, an expansion/upgradation of infrastructure in operation or a combination of both.

- **Justification for the Project:** Provide a justification for the proposed project (need) highlighting the benefits to surrounding communities and economic development of the region and country.

- **Project Proponents**
  Names, addresses, telephone numbers, and applicable mandates of proponents, including sub-implementing agencies, project financers.

- Names and contact information for responsible parties within the organization.

3.3 Project Team

This section shall provide information on the multidisciplinary team that prepares the EA. The types of professionals included in the team shall be appropriate to the type of project and the type of environment in which the project is located. The information provided for each member of the EA project team includes the following:

- Names, addresses of project proponent

- Names, contact information, qualifications of key personnel involved in the study; as well the respective area of contribution to the EA.

- List of professionals/experts participating in the EA, their areas of expertise, degrees, experience, professional registrations where applicable should be Annexed.

3.4 Legal and Regulatory Framework

This section of the EA shall define the legal framework under which the EA is being completed listing and summarizing requirements or alternatives used as benchmarks, and evidence of non-applicability or compliance including:

- Information that demonstrates rights and access: Government policy regarding the project, Requirements under Environmental Regulations
- Policy, legal and administrative frame work with reference to the project
- Approvals needed for the project from other state agencies and any conditions laid down by Government agencies for implementation of the project, including Environmental Clearance, Coastal Regulation Zone (CRZ) Clearance if required, Public Works Department (PWD) clearance for flood mitigation, Chennai Metropolitan Development Agency (CMDA) approval, and clearance from Safety and Fire departments as applicable.
- Conformity with other development plans in the area
- Conformity to the World Bank's Environmental Safeguard Policies and Procedures

3.5 Methodology Adopted

This Section should present a brief outline of methodologies and technologies adopted in the preparation of the EA report, including steps adopted for scoping, reconnaissance and field visits, data and information collection, process of conducting surveys and analysis, methodology used for deducing impacts at minimum.

4 Project Description

A full description and location of the proposed project including ancillary facilities and operations such as the camp/housing for construction and operation phases, borrow and disposal areas, sanitary services, waste disposal and transportation infrastructure, etc. as addressed through the sections below. It shall include at a minimum:

4.1 Location

The general location of the project and associated activities in terms of:

- Political-administrative location (as per administrative divisions) with accompanying location map
- Means of access in to the project site
- Latitude and longitude of project area
- Maps of project area at a scale of no less than 1: 50,000
- For specific sites where, sensitive locations are identified during the EA process, maps will be provided at a scale of 1: 10,000.
- Project plan and location on a fold-out 11" X 17" page.
- Indicate the project areas and the direct and indirect areas of influence for the physical, biological and social-economic-cultural impacts
- All drawings should present scale and key coordinates or benchmarks as latitude/longitude

4.2 Summary of Proposed Project

Overview of all proposed project facilities and activities and their relationship.

- A detailed drawing showing access points, layout of the projects within the scheme, components including on-site access roads, existing structures, topography and natural features such as water bodies, wetlands and geologic structures: A summary table showing the type, quantity and size of each component

- **Principal project facilities:** Location and design information – primary material of construction (earth, brick, stone, etc.), layout and dimensions. Design drawings should be provided for each facility, including: Plan (overhead view), Elevations (front view), Profiles (side view) and Sections

4.3 Summary of Project Construction phase and timetable

The section should provide information as available on the plan for implementation of the project on ground, the project Engineer can provide facilitation for estimating amounts and numbers based on existing norms for similar infrastructure development projects.

- Schedule for each phase of construction for all project and ancillary facilities (including temporary structures) including, but not limited to:
    - Mobilization
    - Access construction and improvements
    - Land clearing and preparation
    - Blasting
    - Erosion and sediment control
    - Excavation and subgrade preparation
    - Foundation preparation
    - Concrete work
    - Construction or installation of each project activity
    - Stabilization of disturbed areas

- A tabulated rough project implementation schedule for the entire project period should be submitted.
    - Borrow and fill material
        - Locations from which fill material will be sourced
        - Locations where fill material will be placed on-site
        - Locations where fill will be temporarily
        - stockpiled/stored
        - Locations of and process for borrow and spoil disposal
    - Other Construction Material (Sand, Metal, Water, etc.), provide details for each type of material
        - Locations from which the respective material will be sourced
        - Locations where the material will be placed on-site
        - Locations where construction material will be temporarily
        - stockpiled/stored
        - Locations of and process for any associated disposal

- Key areas (related to environmental sensitivity/importance) that should remain undisturbed during construction (waterways, wetlands, forested areas and other "green space," physical cultural resources, etc.)
    - Erosion control structures such as:
        - Temporary diversions for waterways
        - Erosion control barriers
    - Equipment
        - Equipment Roster, specifying type and quantity by size, weight, motor size, and fuel requirements for each piece of equipment or machinery used in each activity
        - Transportation mobilization and mobilization frequency
        - Machinery and equipment mobilization routes to be used, as well as the features of the ways on which they will be transported, including a map of routes, as applicable, and mobilization.
    - Labor during construction (as estimated)
        - Number and type of employees (by local hire and non-local hire) by field of expertise
        - Days per week
        - Hours per day
        - Shifts per day
    - Raw materials to be used for construction
        - Give a complete list of the raw materials and construction materials to be used, indicating the amounts per day, month, and the storage means
        - Include an inventory of chemical, toxic or hazardous substances, active elements, sites and storage means, safety aspects regarding transportation and handling and any other relevant information
        -
- Construction camp(s) and/or arrangements for management of resident labor (if applicable) Description of the camp(s) including but not limited to:
    - A map showing all facilities at a legible scale appropriate to the size of the project
        - Buildings by type (use) and size
        - Roads
        - Electrical transmission lines and/or substation
        - Drainage
        - Water supply and distribution
            - Distribution system
            - Use (m3/day)
            - Rights
            - Sources
- Waste handling and disposal components
            - Existing Sewers
            - Wastewater treatment facilities
            - Solid waste facilities

Decommissioning of temporary structures including planned measures for

- Closure of construction camp
- Closure of any applicable burrow sites
- Returning the area to pre-construction features

- Operation phase -Description of how the project would operate (as appropriate)

4.3 Alternatives Analysis

All project alternatives that are reasonable and feasible and meet the purpose and need for the proposed project shall be identified, summarized in this section, and evaluated in the EA as appropriate. In addition to the proposed project, such alternatives include alternative locations, alternative site configuration of elements of the project, alternative size, and alternative plans for construction, operation and decommissioning of the project including best practices that may avoid and/or reduce the adverse impacts to the physical, biological or social-economic-cultural environments. The following should be presented

- Description of various alternatives like locations or layouts or technologies studied
- Description of each alternative
- Summary of adverse impacts of each alternative
- Selection of alternative

If the project area or the buffer zone of the project area for an alternative is in an ecologically fragile are, the description of the alternative must include a clear justification for not opting for another site. Identify which alternatives will be carried through the analysis in the EA and the basis for that decision.

<u>5 Environmental Setting</u>

Based on information available from the literature, government and special studies or other sources, the EA shall provide information on environmental setting for the different types of physical, biological and social-economic-cultural environments for the current situation, important trends and predicted situation in the absence of the proposed project. Where key information is not available, primary data should be collected to establish the baseline. All sources of data must be cited in the EA when and where they are used. Indicate the direct and indirect and cumulative impact areas of influence for physical, biological, and social-economic-cultural impacts and basis for defining area. This section shall include at a minimum, the following information:

Physical Environment

5.1 Topography

- Provide concise information on the topography and slope conditions and geomorphology
- Describe project areas susceptible to soil liquefaction; planned, areas of potential ground failure, such as subsidence, slumping, and land sliding.

5.2 Soil Resources

The EA shall describe baseline soil resources, and make use of maps, tables and accompanying narrative text to describe the soils at the project site and along new or reconditioned access route associated with the project and included in the EA.

- Underline geology - Soil types, distribution and thickness - Soil permissibility - Soil characteristics in relation to salinity, acidity iron toxicity, ground water recharge and land use capabilities - Mineral resources

5.3 Water Resources

- **Surface water**

- General description of the catchment area along the river-Names and locations on maps of all permanent and intermittent streams, rivers, wetlands, lakes and reservoirs within the area of influence
- Flow: The monthly minimum, mean and maximum recorded flows in m3/s of the river and its tributaries- including the mean annual flow, average flow, annual variation of the flow in the river - minimum dry season flow, base flow
- High flood pattern of the project area including flood levels (for 10, 25, 50, 100 years return periods)
- Seasonal fluctuations in area and volume of wetlands, lakes and reservoirs
- Delineation of watersheds and water drainage pattern in influence using satellite imageries (map)
- Runoff characteristics of watersheds
- Inventories of consumptive and non-consumptive use of water

- **Groundwater**

Provide a map and identify and describe aquifers and underground waters adjacent to the project, indicating the depth of the water table along with trend data:

- Water table levels (dry and rainy season)
    - Flow regime
    - Flow direction
    - Influences of geologic structures (faults, contacts, bedrock fracturing, etc) and surface water bodies
- Location and characteristics of all existing springs and wells in influence (on topographic map)
    - Flow/yield data for each spring and well (including water levels in wells)
    - Depth and construction information for each well
    - Existing uses by type and volume
    - Capacity available
- Groundwater recharge data if available

- **Existing water quality data**
    - Locations of all water quality monitoring stations in and around the project area (with direction and distance from the site)
    - Water quality data for each station for those parameters likely to be affected by project construction, operation or maintenance
    - Physical, chemical and biological water quality characteristics, including water temperature and dissolved oxygen concentrations

Supplemental sampling and analysis (if existing data is not adequate to characterize water quality)

- Summary of Surface water and groundwater standards that apply to the project during the construction phase
- Standards for current uses (in the absence of such standards, identify a set of benchmarks used in the analysis)

5.5 Air and Climate

Baseline information for air resources shall include at a minimum the following:

- Climate and meteorology of the project area (Source of data (meteorological station(s) from which climatological data have been obtained must be provided)
- Temperature variations

- Relative humidity
- Rainfall (total precipitation, rainfall intensity, and duration by month)
- Typical wind direction and speed
- Risk of high impact flooding, storms, storm surges, hurricane levels, tropical storms frequency and seasonality

5.6 Noise and Vibration

Present a description of the noise and vibration levels for sensitive receptors near where noise generating activities of the project may occur. The EA shall include:

- Location of where monitoring was conducted via use of a map, with sensitive receptors clearly identified
- Daytime and night time noise levels (measured in decibels)
- Inventory of existing noise sources

5.7 Aesthetic and Visual Resources

- Photos presenting baseline panoramic views of the project sites from potential viewpoints
- Viewsheds or other aesthetic or landscape resources that may exist along the project area
- Existing sources of light contamination

Monitoring of Baseline Physical Parameters

Monitoring of groundwater, noise quality, ambient air quality and surface water quality and crack survey of existing buildings in and around the site, should be recorded at baseline conditions, twice during report preparation and recorded in the form of a detailed Annex in line with the descriptions give in this section.

Biological Environment

The EA shall provide detailed information on the location and condition of ecosystems in and around the project area in the form of narrative, maps and tables, and indicate proximity to sensitive habitats such as Wildlife Reserves National Parks, Sanctuaries, Wetlands, Mangroves, Forest Reserves, Wildlife Corridors, including the following:

5.7 Aquatic and Terrestrial Vegetation/Flora

A mapping of aquatic, terrestrial and wetland habitats project area and areas affected by the project (e.g., project site and areas around, including tributaries and any ancillary infrastructure)

Species and structure (conservation status (endemic, endemic, rare, threatened, tec.) abundance, density, status, plant communities, presence of invasive species, etc.)

5.8 Aquatic and Terrestrial Wildlife/Fauna

- Fish and Aquatic Fauna
    - Identification of fish, mussel, macroinvertebrate and other aquatic species
        - Spatial and temporal distribution
        - Species life stage composition
        - Standing crop
        - Age and growth data
        - Spawning run timing

        - Extent and location of spawning, rearing, feeding habitat
        - Information on endemic, endangered, rare, migratory and commercially important flora and fauna within these habitats should be given.
- Terrestrial Fauna
    - Identify Species (including status, i.e., endemic, migratory, exotic, endangered, threatened, keystone, etc.)
    - Extent and location of breeding, rearing, feeding habitat
    - Information on endangered, rare, migratory and commercially important and fauna within these habitats should be given.
    - Identify any observed sites of breeding/ roosting areas/migratory corridors(seasonal) where applicable (It is recommended for these sites to be mapped via use of GPS)
    - Identify important areas of faunal use (roosts, clay licks, etc.), access paths to the river etc. (It is recommended for these sites to be mapped via use of GPS)

5.9 Ecosystems: Terrestrial, Wetlands, Aquatic, Marine

Much if not all that may be needed to address the environmental setting for terrestrial, wetlands, aquatic and/or marine ecosystems may have been covered in Sections 5.7 and 5.8. This section is not intended to duplicate that information; rather, it should integrate the information to ensure that the structure and function, including key ecosystem services provided, of each ecosystem is adequately presented.

5.10 Endangered or Threatened Species and Habitats

Sections 5.7 and 5.8 should identify all species in the project area. This section should highlight all endangered and threatened species and critical habitat that potentially occur near the project.

5.11 Key Protected Areas

Identify on maps the specific locations and boundaries of relevant national parks, sanctuaries, reserves, etc., as well as any areas proposed for protection. Provide a brief narrative description of each area.

Social-Economic-Cultural Environment[3]

5.12 Socio-Economic Conditions

Identify nearby human settlements including the following information for each settlement:

- Population (size, gender and age distribution)
- Cultural characteristics (religion, ethnic composition, languages spoken, etc.)
- Economic activities (employers, employment and incomes)
- Community organizations
- Public Health and Safety
- Diseases in the project area (including the sources of data and the methodology used to collect and analyze the data)
- Level of emergency services and access to clinics, doctors and hospitals
- Existing practice for assessment of occupational health
- Skills, services and goods availability in the communities applicable to the project works

5.13 Infrastructure

For each human settlement identified in subsection 5.12, describe the infrastructure in or serving the settlement, including the following information:

- Buildings and building use (provide numbers of buildings and brief descriptions of the nature of buildings)
- Transportation infrastructure
- Roads – Location and condition of all existing roads in the project area that may be used by the project purposes, including transportation of material.
    - Condition of the roads
    - Erosion and sediment control
    - Traffic capacity, patterns and densities
- Locations of electrical and telecommunication transmission lines (if applicable)
- Water pipelines

5.14 Cultural, Archeological, Ceremonial and Historic and Resources

Identify all cultural, archaeological, ceremonial and historic resources within the area of influence, including the following information:

Data and maps relating to archeological, cultural, ceremonial, and historic sites in the direct vicinity of the project

5.15 Land Use

Describe actual and potential land use showing location, size and proximity within and surrounding the project area, including land use maps, and to extent possible, integrated into one map.

- Population centers, including information and locations of Schools, Temples, Mosques, Churches, religious centers, cemeteries and other key community infrastructure such as public buildings, Housing (including housing density), Commercial areas
- Agricultural lands
- Forested lands
- Protected areas (including but not limited to)
    - Wildlife refuges- including roosting areas
    - Wetlands and mangroves
    - Other environmentally sensitive areas if identified
- Recreation areas- boat docks, bathing and washing points
- Culturally sensitive areas (including
- Flood plains and other water bodies
- Coastal zones
- Other land uses as appropriate

<u>6 Assessment of Impacts</u>

The EA shall provide information on potential impacts (direct, indirect and cumulative) and the magnitude and frequency of potential impacts on physical, biological, social-economic-cultural resources resulting from construction, operation and closure of the proposed project and alternatives. The assessment shall use standardized predictive methods, such as models, to determine the specific range of impacts on environmental and socio-economic resources.

The EA shall identify which impacts are significant and the criteria used to make this judgment. Critical data input from project description and environmental setting analysis projecting the conditions in the environmental setting in the absence of the proposed project shall be used as the baseline upon which potential impacts are forecast.

The EA shall also identify sources of data used in the analysis and the uncertainties associated with the outputs of each method used.

Physical Impacts

6.1 Geologic Resources and Hazards

Potential impacts to geologic resources and potential effects on project structures shall be described including but not limited to the following:

- Geologic hazards and potential effects on project structures
- Changes in topography and drainage patterns
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context.

6.2 Soil Resources

Potential impacts to soil resources shall be described. The analysis shall include, but not be limited to the following:

- Soil quality
- Contamination
- Potential risk of Salinization due to changes in river topography
- Erosion, slope alteration, vegetation removal and drainage patterns
- Sediment accumulation and transport
- Sediment and hazardous waste removal and disposal
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

6.3 Water Resources

Potential impacts to surface water and groundwater shall be described. The analysis shall include but not be limited to the following:

- Geomorphology
    - Location of all streams and wetlands being affected
    - Modification/diversion in the existing drainage pattern
    - Bank erosion (surface water discharges, stream crossings and dredging)
    - Potential for increased flash flooding
- Quantity
    - Impact of water use on surface water and groundwater, including specific
    - Model results
    - Water table levels
    - Well production
    - Spring and stream flows
- Quality
    - Runoff, erosion and sedimentation from project associated activities
        - Sources
        - Receiving waters

        - Concentrations
    - Physical parameters
    - Chemical parameters
    - Biological parameters
- Description of impact from wastewater discharges, including sewage, which will include an assessment of the existing capacity for sewage treatment in the project locality and identify potential impacts related to the expected load form the proposed development.
- Chemical contamination from herbicides used for any vegetative maintenance during operation (fertilizers and pesticides)
- Likelihood of spills and accidents during construction (Chemical, hazardous waste and fuel spills)
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

6.4 Air and Climate

Potential impacts to air resources shall be described including but not limited to the following:

6.4.1 Impacts on ambient air quality

- Sources (e.g., windblown dust, fixed and mobile equipment)
- Concentrations
- Receptors (e.g., communities, schools, soils, water bodies, ecosystems)
- Greenhouse gas generation
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

6.5 Noise and Vibration

Potential impacts from noise shall be described including but not limited to the following:

- Potential noise levels at different representative sites in the project area and in communities near the project area
- Potential vibration due to blasting and movement of heavy equipment, and related damage to materials and structures
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

6.6 Aesthetic and Visual Resources

Potential impacts to Aesthetic Resources, including light pollution, shall be described including but not limited to the following:

- Impacts on visual resources and landscapes
- Increases in light contamination
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

Biological Impacts

Potential impacts to biological resources shall be described and quantified including but not limited to the following:

6.7 Aquatic and Terrestrial Vegetation/Flora and Associated Ecosystems

Describe and quantify alterations in vegetative cover due to:

- Deforestation or wetlands destruction
- Other vegetative type conversions during land clearance

- Direct removal of trees
- Potential spread of invasive species of flora if any
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

6.8 Aquatic and Terrestrial Wildlife/Fauna and Associated Ecosystems
Describe and quantify alterations in aquatic and terrestrial wildlife populations due to:
6.8.1 Fish and Aquatic Resources

- Loss in habitat (e.g., spawning, rearing, juvenile, or adult habitats) from changes in water quality due to sedimentation and use of chemicals during construction
- Disturbance of aquatic resources during construction, operations, or maintenance activities, including equipment noise, erosion and sedimentation, vehicular movements, or blasting

6.8.2 Wildlife Resources

- Loss of habitat, migratory routes/corridors, and breeding areas due to changes in vegetative cover/wetlands loss
- Disturbance of habitat, migratory routes/corridors and breeding areas due to project construction, operation, and maintenance associated with the project (e.g., noise, vibration, illumination, vehicular movement)
- Loss, loss of access or contamination of drinking water for wildlife species
- Poisoning (e.g., direct contact with toxic waste/substances)
- Animals attracted to garbage and food waste generated at construction camps, restaurants and on-site employee housing

6.8.3 Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

6.9 Endangered or Threatened Species or Habitats
Describe and quantify impacts to endangered or threatened species or habitats

- Biodiversity
- Individual species (with special emphasis on endemic, rare, threatened and endangered species)
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

6.10 Protected Areas

- Any impacts to protected areas, including indirect impacts such as potential threats from resource recovery such as construction material extraction, potential encroachments etc.

Social-Economic-Cultural Impacts
The EA shall assess potential positive and negative impacts to social-economic-cultural resources including but not limited to the following:

6.11 Socio-Economic Conditions

- Increased individual incomes
  - Direct employment at the project
  - Indirect employment generated by project activities
  - Increased purchases from local businesses
  - Other economic activities stimulated in the community as a result of the project
- Employment opportunities for residents
- Displacement and relocation of current settlements, residents or community

- Displacement or disruption of people's livelihoods (e.g., fishing, hunting, grazing, farming, forestry and tourism)
- Public finance requirements – will more infrastructure need to be built and maintained to meet the demands of increased population in the areas of public education and public service (water, sanitation, roads, emergency services, etc.)
- Reduction in quality of life for residents from visual and noise impacts
- Change in crime rate (drugs, alcohol, prostitution, etc.)
- Change in population (temporary or permanent)
- Change in character of community
- Change in religious, ethnic or cultural makeup of community
- Impacts on public health
    - Identification of physical risks and safety aspects
    - Water-related vector diseases (malaria, dengue, etc.)
    - Potential for diseases due to exposure to dust and other project related activities such as handling of explosives, solvents, petroleum products, etc.

6.11.12 Impacts on worker health and safety

- Identification of hazardous jobs and number of workers exposed with duration of exposure
- Occupational diseases due to exposure to dust and other project related activities such as handling of explosives, solvents, petroleum products, etc.
- Identification of physical risks and safety aspects, potential risks
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context.

6.12 Infrastructure

6.12.1 Transportation infrastructure

This section of the EA addresses impacts of transportation and traffic patterns on existing roads. The impacts of new and existing roads on water quality, biological resources and land use should be addressed in those respective
sections. The EA shall assess potential impacts to transportation systems including but not limited to the following:

Potential changes to traffic patterns, densities, and traffic safety issues in area affected by project

- A determination of vehicular traffic density in the project area (before,
- during, and after the proposed activities)
- Potential for traffic accidents
- Congestion
- Noise
- Potential impacts to previously inaccessible areas from improvement of roads

- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context**.**

6.13 Cultural, Archeological, Ceremonial and Historic and Resources

- Destruction during construction
- Damage and alteration
- Removal from historic location
- Introduction of visual or audible elements that diminish integrity

- Neglect that causes deterioration
- Loss of access to traditional use areas
- Damage to resources due to increased visitation promoted by the project
- Impacts to previously inaccessible resources from development/improvement of roads
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

6.14 Land Use

- Temporary and permanent changes in land use by both area and location
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context
- Public infrastructure (schools, cemeteries, churches, other public buildings, communication systems and housing)
- Increased need for additional infrastructure
- Alterations to public infrastructure
- Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

7.15 Specific Construction Related Impacts

- Outline potential impacts of demolition and decommissioning of existing structures if any.
- Estimate amounts of debris, including any hazardous materials (in particular asbestos/asbestos-cement based waste) and impacts on added load of solid waste on existing solid waste management system with relation to the site.

7 Mitigation and Monitoring Measures

This section of the EA must include measures designed to mitigate potential adverse impacts to physical, biological and social-economic-cultural resources from design, construction, operation and closure of the proposed project. These shall include measures to avoid and prevent, and if needed, to reduce or minimize adverse impacts. The consultant must include measures considered to be "best practices" in the design, in particular cost effective measures pertaining to green buildings (energy efficiency, water use efficiency, rain water harvesting, lightning, ventilation tree planting and landscaping) vehicle parking and climate resilient features.

In the Environmental Management Plan section, Section 8, proposed mitigation shall be described in auditable terms and at a level of detail sufficient to demonstrate its effectiveness in addressing the concern or performance criterion, including its anticipated level of effectiveness and/or measurable performance, and design specifications. The monitoring plan must include monitoring throughout the life of the project for each potential mitigation to confirm the effectiveness of the measure and support contingency plans to provide assurance that the project, at the site preparation, construction, operation, expansion, and closure stages will meet applicable environmental requirements/standards by law, World Bank Environmental safeguard Policies and the World Bank Group General Environmental and Health Safety Guidelines, and fall within the limits of impacts deemed acceptable upon approval of the EA. Some important items to address in the mitigation plan and associated monitoring plans include, but are not limited to the following:

7.1 Geologic Resources and Hazards

- Pre-excavation, onsite geological inspection and geotechnical study protocols to determine slope stability and landslide risks (preferably from an authorized body such as the National Building Research Organization (NBRO) should be summarized, with the main report Annexed)
- Slopes built and maintained to avoid landslides and favor revegetation and soils formation
- Slope stabilization by constructing retaining walls, using vegetation, geotextile membranes, or other mechanical methods Blasting Plan, if applicable (summary of relevant measures with full document in Annex)
- Use of signage to mark areas where slopes are not stable as a preventive measure in the event of a landslide Mitigation measures unique to specific alternatives
- Safe Blasting Plan for any obstructions along the river and tributaries, if applicable (summary of relevant measures with full document in Annex)
- Decommissioning Plan for removal of existing buildings and utilities in line with international best practice and the WB Guidelines.

7.2 Soil Resources

- Erosion and sedimentation control measures (temporary and permanent) including when each will be installed or implemented, how often it will be checked and the process for and timing of removal of temporary measures
- Spoil and disposal measures
- Best management practices to minimize soil disturbance
- Soil Rehabilitation Plan-if needed (summary of relevant measures as per the World Bank decommissioning guidelines, with full document in Annex)
- Restrictions on discharge of pollutants to soil
- Mitigation measures unique to specific alternatives

7.3 Water Resources

7.3.1 Quality

- Water Quality Management Plan (summary of relevant measures with full document in Annex)
    - Sewage and domestic wastewater
    - Nonpoint sources – runoff, erosion and sediment control prevention measures
- Spill Prevention and Containment Plan (summary of relevant measures with full document in Annex)
- Solid Waste Management Plan (summary of relevant measures with full document in Annex)
- Hazardous Waste Management Plan (summary of relevant measures with full document in Annex)
- Transport system construction and maintenance to avoid erosion and sedimentation including:
    - Elevation or rerouting
    - Design for proper run-off control and catchment
    - Provision of culverts to allow flow that might otherwise be impeded by
    - roadways or other rights of way
    - Appropriate traffic control
- Off-road vehicle uses restrictions
- Waste minimization practices

7.3.2 Quantity

- Water conservation practices

- Mitigation measures unique to specific alternatives

7.4 Air and Climate

- Dust control measures
- Energy conservation measures
- Emissions control measures
    - Emissions reduction equipment
    - Maintenance and inspection of equipment and vehicles using combustion engines to reduce emissions
- Spill Prevention and Containment Plan (summary of relevant measures with full document in Annex)

7.5 Noise and Vibration

- Noise control measures
    - Noise reduction technologies (suppression equipment, sound-absorbing structures, vibration dampening devices, berms, noise barriers, etc.)
    - Rerouting of traffic and other infrastructure related activities to minimize impacts of noise and vibration
    - Time of day limitations on blasting and movement of heavy equipment when near houses not being operated during evening hours
- Safe Blasting Plan, if applicable (summary of relevant measures with full document in Annex)
- Crack Survey and documentation of structural conditions of existing buildings in project area, especially those in proximity to identified to project implementation sites, burrow sites, quarry sites.
- Mitigation measures unique to specific alternatives

7.6 Aesthetic Resources

- Relocation of project to another site
- Design recommendations of placement of project structures on sites that may impact views
- Design recommendations for permissible height and location of structures blocking view or producing light pollution
- Mitigation measures unique to specific alternatives

7.7 Aquatic and Terrestrial Vegetation/Flora and Associated Ecosystems

- Relocation of sensitive, threatened or endangered species if applicable (summary of relevant measures with inclusion in a full Flora and Fauna Relocation plan, with potential relocation sites identified and proposed mechanisms for relocation, presented in an Annex)
- Measures to compensate for loss or damage of forests, wetlands or other critical ecosystems, including establishment of any areas for offsets that may be required (All trees to be removed for any structural purposes should be counted and documented with, compensatory tree planting will need to meet the 1:2 minimum standard)
- Restoration/Rehabilitation Plan for disturbed areas (summary of relevant measures with full document in Annex)
- Control of alien invasive weeds
- Mitigation measures unique to specific alternative

7.8 Aquatic and Terrestrial Wildlife/Fauna and Associated Ecosystems

7.8.1 Fish and Aquatic Resources

- Modification recommendations to structures and locations and timing of activities to avoid critical ecosystems, migratory routes and breeding areas
- Scheduling of construction to avoid critical or important fish life history periods (e.g., spawning)
- Relocation of sensitive, threatened or endangered species if applicable (summary of relevant measures with inclusion in a full Flora and Fauna Relocation plan, with potential relocation sites identified and proposed mechanisms for relocation, presented in an Annex)
- Mitigation measures unique to specific alternatives

7.8.2 Wildlife Resources

- Modification recommendations to locations of structures and locations and timing of activities to avoid critical ecosystems, migratory routes and breeding areas
- Scheduling construction to avoid critical or important wildlife history periods (e.g., breeding, nesting, migratory seasons)
- Relocation of sensitive, threatened or endangered species if applicable (summary of relevant measures with inclusion in a full Flora and Fauna Relocation plan, with potential relocation sites identified and proposed mechanisms for relocation, presented in an Annex)
- Mitigation measures unique to specific alternatives

7.9 Health and Safety

- Development of a "Code of Conduct" (with associated training program) for workers to show respect to the local populations and social rules
- Basic conditions for the establishment, management and monitoring of health and safety of labor camps and/or worker accommodations.
- Community Health and Safety Plan to protect local population from potential nuisances, safety and health problems caused by the project implementation and operation (summary of relevant measures with full document in Annex).
    - The Plan should recommend a complaint handling mechanism that will facilitate the handling and documentation of community complaints throughout the project life cycle.
- Development of an Occupational Health and Safety and Accidents Prevention Plan with appropriate accident prevention program, reporting and periodic review (summary of relevant measures with full document in Annex) including provision of routine training and testing, and proper safety equipment such as hearing protection, hardhats, steel-toed shoes, safety railings and fall arrestors and periodic review and incident reporting system (summary of relevant measures with full document in Annex)

7.10 Infrastructure

7.10.1 Transportation infrastructure

This section of the EA should address mitigation measures for transportation and traffic patterns on existing infrastructure during project implementation.

- Traffic Management Plan for management of influx of construction related vehicular traffic on existing transportation infrastructure (summary of relevant measures with full document in Annex). The Traffic Management Plan should include, but not limited to the following information.

- Permissible times for transport of construction material to and from project sites during the construction phase.
- Placement of traffic signals
- Establishing, posting and enforcing speed limits for the vehicles that transport construction material
- Training requirements for employees, contractors and subcontractors on measures to reduce or avoid potential accidents
- Hiring and training security personnel devoted exclusively to preventing accidents in the access road and controlling the speed of the vehicles transporting construction material.

- Mitigation of impacts of new and existing transportation infrastructure on water quality and biological resources and land use should be addressed in those respective sections.

7.10.2 Communications infrastructure

- For all common utilities identified to be affected such as: telephone cables, electric cables, electric poles, water pipelines, public water taps, etc. the EA should detail a course of action for relocation where required.
- Propose a mechanism for ensuring community consensus and means of ensuring minimum impact to common utilities like telephone cable, electric cables, electric poles, water taps etc.
- List requisite clearances to be obtained from the concerned authorities prior to commencement of works during implementation.

7.11 Cultural, Archeological, Ceremonial and Historic and Resources

- Recommendations for modification of structures and activity locations to avoid significant archeological,
- cultural, ceremonial and historic sites
- If avoidance is not possible, propose appropriate resource recovery operations before disturbing the sites- these include removal and relocation and management of construction activities to ensure no damage where in-situ
- Propose examples of means of clearly delineating boundaries and post signs identifying existing archeological, cultural and historic sites where they are they are to be protected in-situ.
- Protocols for use during construction and operation stages for identifying and responding to Chance finds (archeological, cultural, ceremonial and historic sites not identified during the preliminary surveys)
- Mitigation measures unique to specific alternatives

7.12 Organizational Arrangements for Managing Environmental Impacts During the Operational and Maintenance Phase -for example measures such as establishment of resident associations, maintenance corpus funds, specific maintenance requirements of green spaces.

8 Environmental Management Plan (EMP)

The EA shall include an Environmental Management Plan to prevent, mitigate and monitor each impact identified in the EA. The EMP should be presented in Matrix form, as per the guidance provided and will describe actions to be taken in sufficient detail to provide a basis for subsequent auditing of compliance with commitments made in the EA process including who is responsible, how and when it will be implemented, what will be done and what results will be achieved, why it is being done, and

how to know whether it is effective in addressing the underlying concerns. The Environmental Management Plan shall have the following elements:

8.1 Overview of Environmental Management Plan Organization and Policy

- Describe the project management and how environmental management and organization relates to overall project responsibility.
- Describe the personnel and performance accountability system for design, operation, maintenance and
- closure for implementation of mitigation and monitoring measures
- Describe the environmental policy that will govern the Project throughout its implementation, including at least the objectives, scope, commitment to continuous improvement, control and environmental monitoring and good relationship with neighboring communities, as well as the commitment to internal controls such as compliance and environmental monitoring and routine audits
- Identify the entities responsible for the implementation of mitigation measures, in each phase.
- The EMP should also recommend measures to be established for grievance redressal during the project period and indicate the minimum standards that need to be maintained.

8.2 Project-wide EMP including an implementation schedule.

*This EMP will summarize and refer to measures stipulated in all sub-plans which are part and parcel of the Environmental Management Plan as identified in **Section 7.***

*The EMP should cover all impact areas identified in **Section 6** and present mitigation measures presented in **Section 7.***

Project Activity	**Potential Environmental Impacts**	**Proposed Mitigation Measures**	**Institutional Responsibilities** (Implementation and Supervision)	**Estimated Quantities Required and Material Specifications Recommended**	**Cost Estimates**	**Comments** (e.g. secondary impacts**)**
Detailed design and planning Phase						
Pre-Construction Phase -Site Preparation						
Construction Phase						
Operation and Maintenance Phase						

8.3 Project-Wide Monitoring Plan

The monitoring plan will correspond to the EMP and include but not limited to the short-term and long-term monitoring of resource condition, including but not limited to:

- Slope stability
- Water Quality Monitoring Program
    - Where, how and when monitoring shall be conducted
    - Parameters to be monitored
    - Monitoring frequencies
    - Sampling and analytical protocols to be used
- Air Quality Monitoring Program
    - Where, how and when monitoring shall be conducted
    - The Parameters to be monitored
    - The monitoring frequencies
    - The sampling and analytical protocols to be used
- Noise and Vibration
- Short-term and long-term monitoring to ensure that the mitigation measures are functioning as predicted and that rehabilitation is working

*The requisite environmental standards that are to be met should be those stipulated in the **World Bank Group General Environmental Health and Safety Guidelines**. National standards may be adopted, where they are deemed more stringent to those presented in the afore mentioned Guidelines.*

Proposed Mitigation Measure	**Parameters to be monitored**	**Location**	**Measurements** (Incl. methods & equipment)	**Frequency of Measurement**	**Responsibilities** (Incl. review and reporting)	**Cost** (equipment & Individuals)
Detailed design and planning Phase						
Pre-Construction Phase						
Construction Phase						
Operation and Maintenance Phase						

8.4 Management of Other On- or Off-Site Environmental Pollution Control and Infrastructure

This section should address management of critical elements of pollution control and infrastructure that are not otherwise included in the mitigation plan because they were considered an essential part of the proposed project.

8.5 Summary of all Training Recommendations

Institutional Strengthening Activity	Position(s)	Scheduling	Responsibility(is)	Cost Estimates	
Training Activity	**Participants**	**Types of Training**	**Content (modules, Etc.)**	**Scheduling**	**Cost Estimates**

8.6 Contingency Plans

Contingency plans shall be prepared and described to address: a) failure to meet specific performance criteria established by law or necessary for the project to meet its commitments in the EA and b) respond to natural and other risks previously identified and mitigated in the EA in the event reasonable and feasible mitigation measures to address the risks are inadequate.

- Performance-related Contingency Plans, indicating the steps that will be taken should monitoring indicate that:
  - Environmental standards are not being met
  - Impacts are greater than predicted
  - mitigation measures and/or rehabilitation are not performing as predicted

- Natural Disaster Risk Response Plan (assumes that risk identification and risk reduction have been addressed in other parts of the EA)
- Other Risks Response Plans (assumes that risk identification and risk reduction have been addressed in other parts of the EA)
- Contingency plans for maintaining service or reducing downtime in the event of accidents or natural catastrophes that disrupt project operation

9 Conclusion

This section shall specify the environmental acceptability of the project, taking into account the impacts and measures identified during the assessment process. It shall also identify any other conditions or external requirements for ensuring the success of the project.

10 Annexes

These shall be numbered and duly referenced in the text. Typical Annexes that are required include the following

10.1 Public Consultation-*A summary of public consultations. The consultant shall carry out consultations at a minimum of twice during the EA/EMP preparation period, once during scoping and when the draft report has been finalized. All following documented need to be attached.*

- Public consultation plan

- A summary of public outreach activities including: audience, number of persons, organizations involved, concerns raised, responses to comments
- Summary of response to comments
- Actual copies of written comments
- Copies of signed participant lists should be included

10.2 Technical Supporting Documents

- Include maps, plans, charts and figures in the sequence mentioned in the EA document
- Zoning maps with resources and results of impacts
- Special Studies if relevant but not readily accessible
- Detailed materials on predictive tools/models and assumptions used for the assessment but too detailed for the body of the EA

10.3 All supplementary plans as per Sections 6 and 7 to EMP

10.4 References

Submit a list of all references, (books, articles, technical reports and other information sources) cited in the various chapters of the EA study with full biographic references, and the following conventional procedures cited in the literature: author, year, title, source, number of pages, and city of publication or issuance.